



**MSP** **GN** **GM** **BH**

**Märkische Stanz-Partner**



**[stanznormalien]**  
**[standarddiecomponents]**  
**Stand / Revision Status 11/2018**

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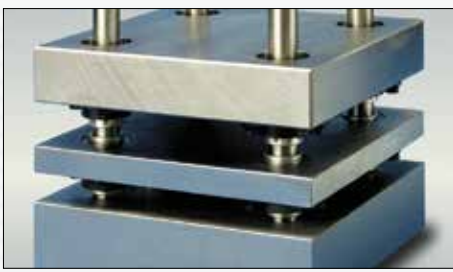
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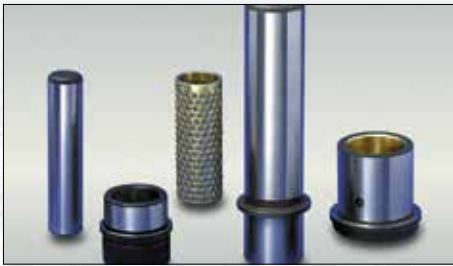
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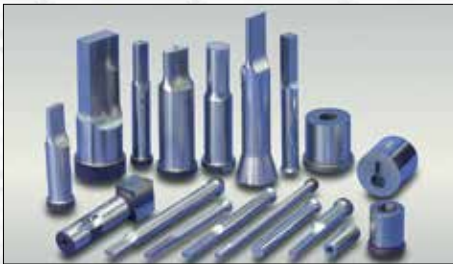
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| Zylinderstifte DIN EN 28734, Form A (DIN 6325)                                     | TH 700                 | TH.6          |
| Zylinderstifte mit Innengewinde, DIN EN 28735 Form A (DIN 7979)                    | TH 705                 | TH.7          |

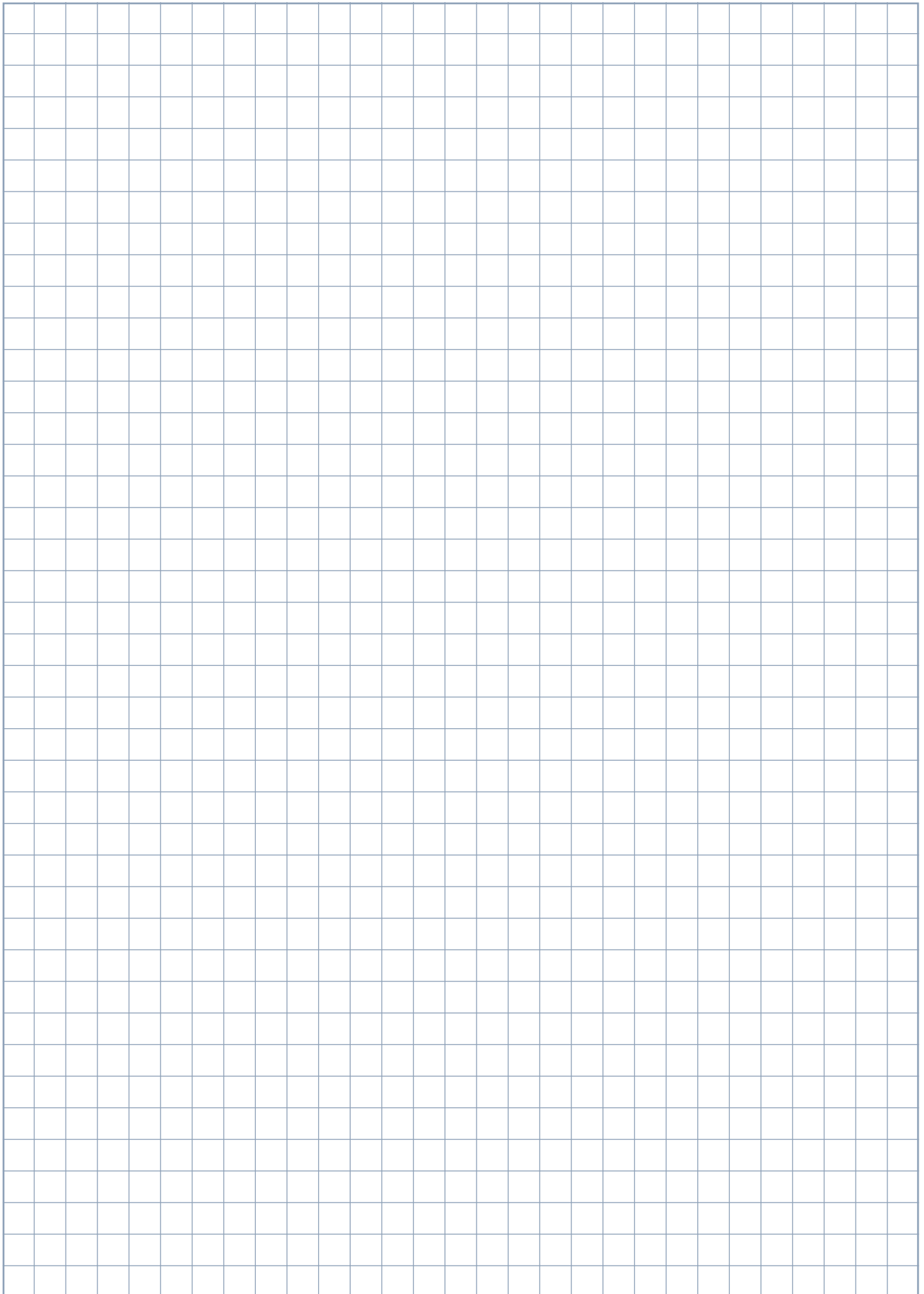
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| <b>A / B</b>  |                        |               |
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| Ball cages with circlip   | FS 424                 | FS.19, FS.20  |
| Ball cages, brass   | FS 425                 | FS.18         |
| Ball cages, brass, M-Line   | FS 325                 | FS.6          |
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| Ball lock die buttons, light duty, round  | SE 340                 | SE.54         |
| Ball lock punches, heavy duty   | SE 300                 | SE.44         |
| Ball lock punches, heavy duty, inverted   | SE 303                 | SE.50         |
| Ball lock punches, heavy duty, inverted, Types O, S, H, L                               | SE 304 .               | SE.52         |
| Ball lock punches, heavy duty, inverted, Types O, S, H, L , with spring ejector         | SE 324 .               | SE.53         |
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| Ball lock punches, heavy duty, shouldered shank   | SE 301                 | SE.46         |
| Ball lock punches, heavy duty, shouldered shank, Types O, S, H, L                       | SE 302 .               | SE.48         |
| Ball lock punches, heavy duty, shouldered shank, Types O, S, H, L, with spring ejector  | SE 322 .               | SE.49         |
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| Compression springs, ISO 10243, Color code red: heavy load springs                      | FE 833 SB              | FE.8, FE.9    |
| Compression springs, ISO 10243, Color code yellow: extra h. load springs                | FE 834 BB              | FE.10, FE.11  |
| Compression springs, US color coded, Color code blue: light load springs                | FE 835 LB              | FE.12, FE.13  |
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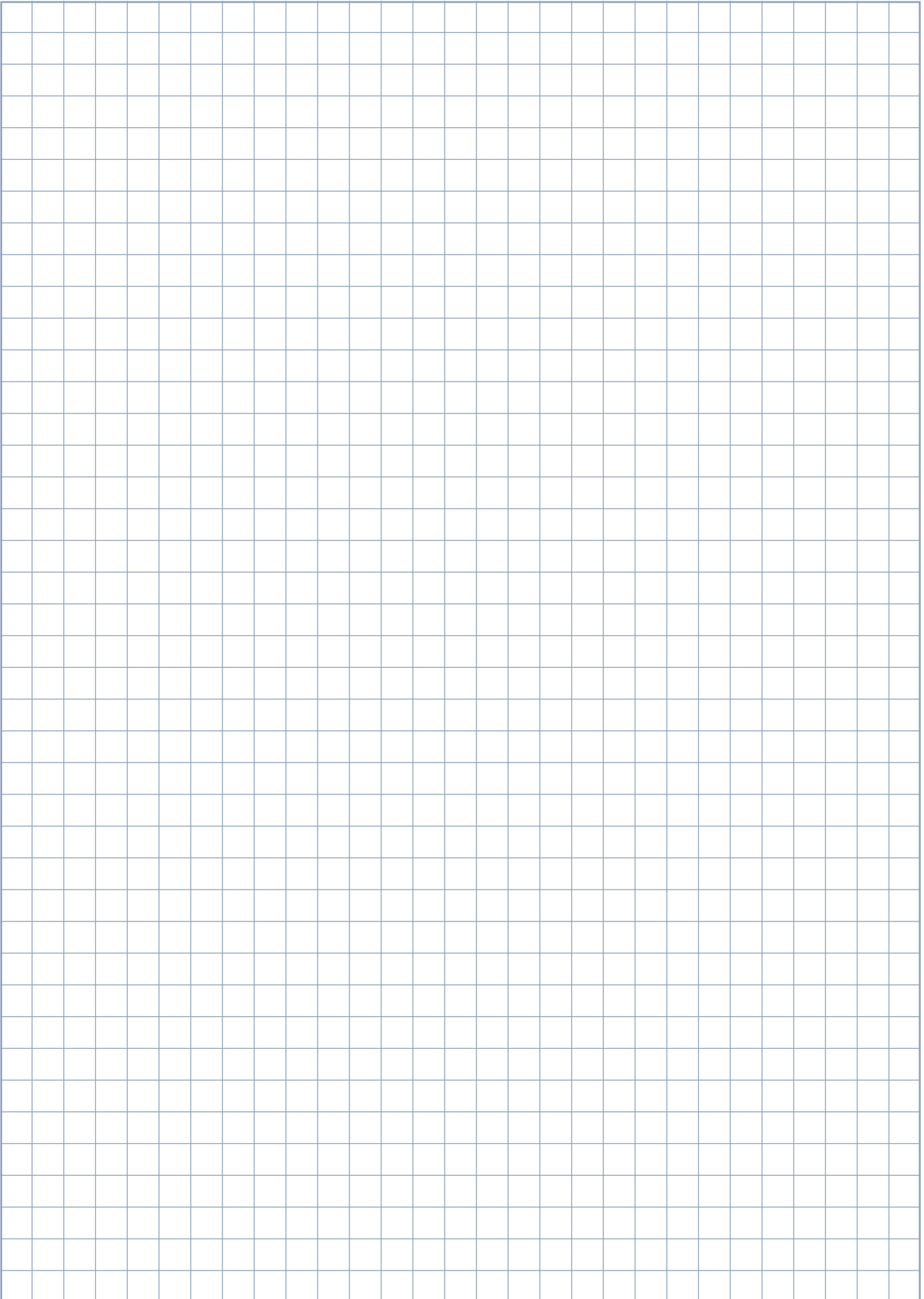
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| <b>L</b>   |                        |               |
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| Leader pin bushings, with collar, steel, long headed, RM-coated                   | FS 440 RM, FS 450 RM   | FS.12         |
| Leader pin bushings, with collar, steel, M-Line, long headed, RM-coated           | FS 340 RM, FS 350 RM   | FS.3          |
| Leader pin bushings, with collar, steel, M-Line, short headed, RM-coated          | FS 330 RM              | FS.3          |
| Leader pin bushings, with collar, steel, short headed, RM-coated                  | FS 430 RM, FS 439 RM   | FS.12         |
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| Leader pin bushings, with collar, steel/bronze, M-Line, short headed              | FS 331                 | FS.4          |
| Leader pins for large dies, DIN 9833  | FS 410, FS 412         | FS.10, FS.11  |
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| Lifting brackets  | TH 220                 | TH.23         |
| Lifting brackets with rope stop safety, VDI 3366                                  | TH 221                 | TH.24         |
| Lifting eye nuts, high-strength   | TH 58 R                | TH.33         |
| Lifting pins  | TH 230                 | TH.25         |
| Lifting pins, VDI 3366  | TH 250                 | TH.26         |
| Lifting points with oval ring for direct chain connection                         | TH 60 R, TH 61 R       | TH.39, TH.40  |
| Lifting points, threaded  | TH 59 R                | TH.37         |
| Lifting points, threaded, Standard / Vario  | TH 54 R                | TH.36         |
| Locating pins   | TH.943, TH 944         | TH.45         |
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| Punches 30° head, shouldered shank  | SE 732                 | SE.24         |
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| Steel die sets, 2 plates, 2 leader pins, types A-C-D, M-Line                            | SG 2 . RM              | SG.26 - SG.29 |
| Steel die sets, 2 plates, 4 leader pins, type Q   | SG 2 Q                 | SG.13 - SG.16 |
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| Steel die sets, 3 plates, 4 leader pins, type Q   | SG 3 Q                 | SG.17 - SG.20 |
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| Supports  | NCVA....               | TH.64         |

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| <b>X / Y / Z</b>   |                        |               |
| XXL - steel plates and welded units with additional work / secondary operation |                        | SG.43 - 46    |

A large rectangular area filled with a light blue grid pattern, intended for taking notes. The grid consists of small squares, approximately 20 columns wide and 80 rows high.

A large, empty grid area for taking notes, consisting of many small squares. The grid is approximately 30 squares wide and 60 squares high.








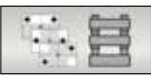

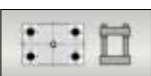
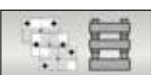

**MSP** GN GM BH



**Märkische Stanz-Partner**



**[säulengestelle]**

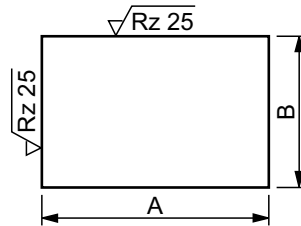
**[diesets]**

|    | <b>Säulengestelle aus Stahl</b>              | <b>Steel die sets</b>                              | <b>Best.-Nr. Order no.</b> | <b>Seite Page</b>  |
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|    | <u>2 Platten, 4 Säulen, Typ Q</u>            | <u>2 plates, 4 leader pins, type Q</u>             | <b>SG 2 Q</b>              | <b>SG. 13 - 16</b> |
|    | <u>3 Platten, 2 Säulen, Typ A-C-D</u>        | <u>3 plates, 2 leader pins, types A-C-D</u>        | <b>SG 3 .</b>              | <b>SG. 9 - 12</b>  |
|    | <u>3 Platten, 4 Säulen, Typ Q</u>            | <u>3 plates, 4 leader pins, type Q</u>             | <b>SG 3 Q</b>              | <b>SG. 17 - 20</b> |
|    | <u>2 Platten, 2 Säulen, Typ A-C-D M-Line</u> | <u>2 plates, 2 leader pins, types A-C-D M-Line</u> | <b>SG 2 . RM</b>           | <b>SG. 26 - 29</b> |
|    | <u>2 Platten, 4 Säulen, Typ Q M-Line</u>     | <u>2 plates, 4 leader pins, type Q M-Line</u>      | <b>SG 2 Q RM</b>           | <b>SG. 34 - 37</b> |
|   | <u>3 Platten, 2 Säulen, Typ A-C-D M-Line</u> | <u>3 plates, 2 leader pins, types A-C-D M-Line</u> | <b>SG 3 . RM</b>           | <b>SG. 30 - 33</b> |
|  | <u>3 Platten, 4 Säulen, Typ Q M-Line</u>     | <u>3 plates, 4 leader pins, type Q M-Line</u>      | <b>SG 3 Q RM</b>           | <b>SG. 38 - 41</b> |

|   | <b>Großstahlplatten</b>  | <b>XXL - Steel plates</b>   | <b>Best.-Nr. Order no.</b> | <b>Seite Page</b>  |
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|  | <u>Großstahlplatten und Stahl-Schweiß-Konstruktionen mit Sonderbearbeitung</u> | <u>XXL - Steel plates and welded units with additional work / secondary operation</u> |                            | <b>SG. 43 - 46</b> |

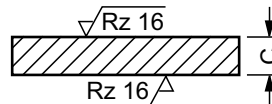
Mat.: C45

Toleranz Außenmaße /  
Tolerance of length and width



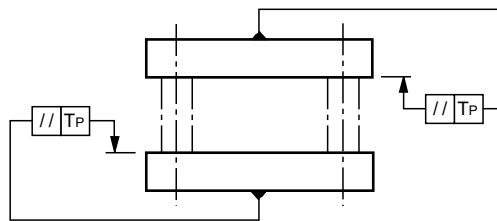
A x B +0,06  
-0,06

Toleranz Plattenstärke /  
Tolerance of thickness



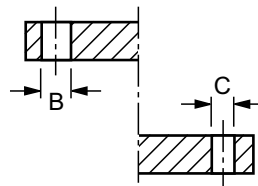
C ± 2

Parallelität der Flächenpaare /  
Parallelism of two surfaces



TP = 0,012 / 100 mm

Bohrungstoleranzen /  
Hole tolerances



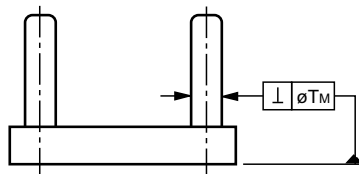
B = Aufnahmebohrung Buchse/ Mounting hole for bushing:

FS 468 = K7  
FS 4 .. = H6  
FS 6 .. = H6  
FS 7 .. = H6

C = Aufnahmebohrung Säule/ Mounting hole for leader pin:

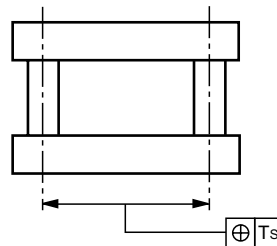
FS 420 = R7  
FS 419 = JS6  
FS 400/403 = H6

Winkelgenauigkeit der Führungssäulen /  
Angular accuracy of leader pins



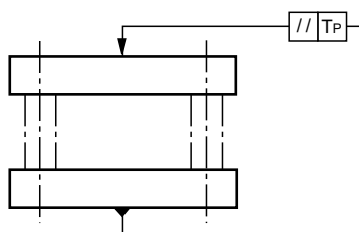
TM = 0,012 / 100 mm

Toleranz Systemabstände /  
Tolerance of dimensions between leader-  
pin (and bushing) - holes



Ts = ± 0,010

Planparallelität im  
zusammengebauten Zustand /  
Parallelism after mounting



TP = 0,015 / 100 mm

# Säulen-Buchsen-Kombination für 2-Plattengestelle

## Combination of leader-pin and -bushing in 2-plate-die-sets



SÄULENGESTELLE / DIE SETS

Bestellbeispiel / Order-example

| 2 C                           | 643                           | P                               | 41                            | Z  |
|-------------------------------|-------------------------------|---------------------------------|-------------------------------|--|
| Gestelltyp<br>Type of die set | Kataloggröße<br>Catalog sizes | Säulentyp<br>Type of leader pin | Buchsentyp<br>Type of bushing | Position der Haltestücke<br>Position of holding clamps |

**Gestelltyp / Type of die set**

**Position der Haltestücke / Position of holding clamps**

**Buchsentyp / Type of bushing**

**Sinterbuchse  
Leader pin bushing, sintered**

|        |        |        |
|--------|--------|--------|
|        |        |        |
| FS 741 | FS 751 | FS 755 |
| 46     | 47     | 48     |

**Stahlbuchse mit Bronzeplattierung  
Leader pin bushing, bronze plated**

|        |        |        |
|--------|--------|--------|
|        |        |        |
| FS 641 | FS 651 | FS 655 |
| 41     | 42     | 43     |

**Stahlbuchse mit Ms-Käfig  
Leader pin bushing with ball cage**

|                 |                 |                 |
|-----------------|-----------------|-----------------|
|                 |                 |                 |
| FS 453 + FS 425 | FS 457 + FS 425 | FS 458 + FS 425 |
| 51              | 52              | 53              |

**Säulentyp / Type of leader pin**

|                             |  |
|-----------------------------|--|
| eingepresst<br>press-fitted | Schnellwechselsäule mit Bund<br>Leader pin with collar |
|                             |  |
| FS 420                      | FS 419   |
| P                           | R  |

Bestellbeispiel / Order-example

|                               |                               |                                 |                               |  |
|-------------------------------|-------------------------------|---------------------------------|-------------------------------|--|
| <b>3 C</b>                    | <b>643</b>                    | <b>P</b>                        | <b>71</b>                     | <b>Z</b>   |
| Gestelltyp<br>Type of die set | Kataloggröße<br>Catalog sizes | Säulentyp<br>Type of leader pin | Buchsentyp<br>Type of bushing | Position der Haltestücke<br>Position of holding clamps |

**Gestelltyp / Type of die set**

**Buchsentyp / Type of bushing**

| Sinterbuchse<br>Leader pin bushing, sintered                           |  |
|--|--|
| C1 = FS 741<br>C3 = FS 731<br>88                                       | C1 = FS 732<br>C3 = FS 731<br>87                   |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |  |
| C1 = FS 641<br>C3 = FS 631<br>71                                       | C1 = FS 632<br>C3 = FS 631<br>72                   |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |  |
| C1 = FS 458 + FS 425<br>C3 = FS 457 + FS 425<br>91                     | C1 = FS 453 + FS 425<br>C3 = FS 457 + FS 425<br>92 |

**Säulentyp / Type of leader pin**

|                             |  |
|-----------------------------|--|
| eingepresst<br>press-fitted | Schnellwechselsäule mit Bund<br>Leader pin with collar |
|                             |  |
| FS 420<br>P                 | FS 419<br>R  |

**Position der Haltestücke / Position of holding clamps**

|        |        |
|--------|--------|
|        |        |
| Pos. Z | Pos. X |

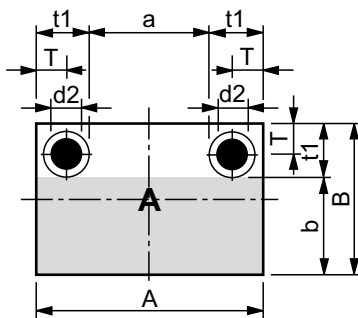
| Position<br>Position | Platten-<br>maße<br>Plate length<br>and width | Platten-<br>stärke<br>Plate<br>thickness |    |    | Säulentyp in C1<br>oder C2*<br>Type of leader pin<br>in C1 or C2* |             | Buchsentyp in C1<br>oder C2**<br>Type of bushing<br>in C1 or C2** |            | Buchsentyp<br>in C3<br>Type of bushing<br>in C3 |            | Haltestück-<br>position<br>Position of holding<br>clamps |
|----------------------|---|--|----|----|---|-------------|---|------------|---|------------|--|
|                      |   | A x B                                    | C1 | C2 | C3  | FS ...      | d1 x l  | FS ...     | d x l   | FS ...     |  |
| Q                    | 610 x 494                                     | 78                                       | 48 | 38 | 420   | 40/42 x 250 | 632   | 40/42 x 67 | 631   | 40/42 x 51 | X  |

\* = Säulentyp in C1 oder C2 bitte angeben. / Please fill in type of leader pin in C1 or C2.

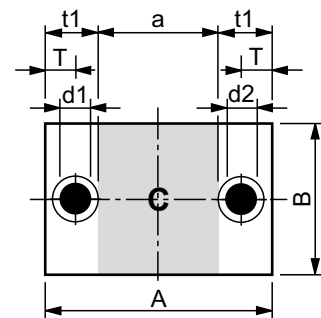
\*\* = Buchsentyp in C1 oder C2 bitte angeben. / Please fill in type of bushing in C1 or C2.

Arbeitsflächen / Working areas

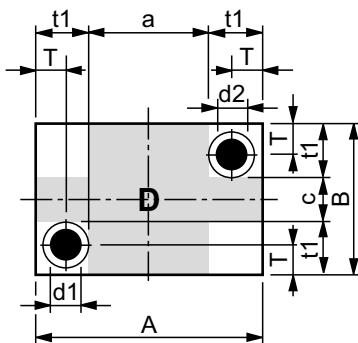
$b = B - t_1$



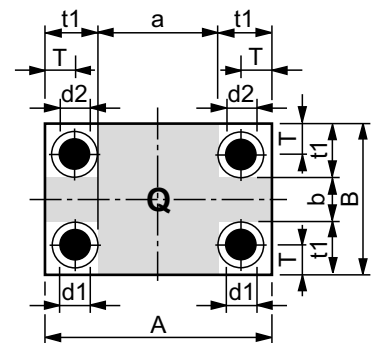
$a = A - (2 \times t_1)$



$a = A - (2 \times t_1)$   
 $c = B - (2 \times t_1)$



$a = A - (2 \times t_1)$   
 $b = B - (2 \times t_1)$



Zylindrische Führungsbuchsen

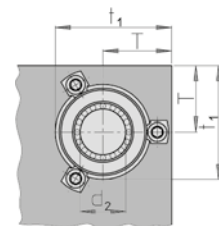
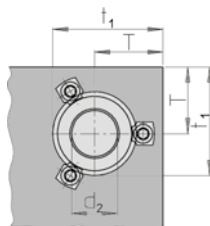
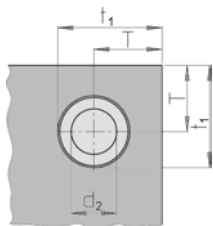
Leader pin bushings, cylindrical

Führungsbuchsen mit Bund

Leader pin bushings, with collar

Führungsbuchsen mit Bund

für Kugelführung  
Leader pin bushings, with collar  
for ball-bearings



| $d_1/d_2$ | T  | $t_1$ | $d_1/d_2$ | T  | $t_1$ | $d_1/d_2$ | T  | $t_1$ |
|-----------|----|-------|-----------|----|-------|-----------|----|-------|
| 18/19     | 25 | 40    | 18/19     | 32 | 49    | 18/19     | 35 | 55    |
| 24/25     | 29 | 46    | 24/25     | 37 | 59    | 24/25     | 40 | 65    |
| 30/32     | 37 | 60    | 30/32     | 44 | 71    | 30/32     | 48 | 79    |
| 40/42     | 45 | 74    | 40/42     | 49 | 81    | 40/42     | 53 | 89    |
| 50/52     | 52 | 87    | 50/52     | 57 | 97    | 50/52     | 61 | 105   |
| 63        | -  | -     | 63        | 64 | 117   | 63        | -  | -     |
| 80        | -  | -     | 80        | 73 | 135   | 80        | -  | -     |



| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Sinterbuchse<br>Leader pin bushing, sintered                           |                 |                 |
|  |                 |                 |
| FS 741   | FS 751          | FS 755          |
| 46   | 47              | 48              |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 641   | FS 651          | FS 655          |
| 41   | 42              | 43              |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 453 + FS 425  | FS 457 + FS 425 | FS 458 + FS 425 |
| 51   | 52              | 53              |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 420                         | FS 419  |
| P                              | R   |

| Gestelltyp / Type of die set |  |
|------------------------------|--|
|                              |  |
|                              |  |
|                              |  |

| Position der Haltestücke / Position of holding clamps |        |
|---|--------|
|   |        |
| Pos. Z  | Pos. X |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |                 |                 |                 |             |             | Gewicht / Weight [kg] |             |             |             |             |                 |                 |                |      |  |  |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-----------------|-----------------|-----------------|-------------|-------------|-----------------------|-------------|-------------|-------------|-------------|-----------------|-----------------|----------------|------|--|--|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 46<br>41    |             |             | 47<br>42        |                 |                 | 48<br>43    |             |                       | 51          |             |             | 52          |                 |                 | 53             |      |  |  |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B     | b<br>X<br>A     | c<br>X<br>A     | a<br>X<br>B | b<br>X<br>A |                       | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |                 |                 |                |      |  |  |
| 601          |                          | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 7,0  |  |  |
| 602          | 125<br>X<br>125          | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 27<br>X<br>125  | 76<br>X<br>125  | 27<br>X<br>125  |             |             |                       |             |             |             |             | 70<br>X<br>125  |                 |                | 7,7  |  |  |
| 603          |                          | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 8,9  |  |  |
| 604          |                          | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 8,8  |  |  |
| 605          | 160<br>X<br>125          | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 62<br>X<br>125  | 76<br>X<br>160  | 27<br>X<br>160  |             |             |                       |             |             |             |             | 50<br>X<br>125  | 70<br>X<br>160  |                | 9,6  |  |  |
| 606          |                          | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 11,2 |  |  |
| 607          |                          | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 11,0 |  |  |
| 608          | 160<br>X<br>160          | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 62<br>X<br>160  | 111<br>X<br>160 | 62<br>X<br>160  |             |             |                       |             |             |             |             | 50<br>X<br>160  | 105<br>X<br>160 | 50<br>X<br>160 | 12,0 |  |  |
| 609          |                          | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 14,0 |  |  |
| 610          |                          | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 10,8 |  |  |
| 611          | 200<br>X<br>125          | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 102<br>X<br>125 | 76<br>X<br>200  | 27<br>X<br>200  |             |             |                       |             |             |             |             | 90<br>X<br>125  | 70<br>X<br>200  |                | 11,8 |  |  |
| 612          |                          | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 13,7 |  |  |
| 613          |                          | 33                               | 28 | -  |            | 150                                 | 110 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 16,4 |  |  |
| 614          | 200<br>X<br>160          | 33                               | 33 | -  | 24/25      | 160                                 | 120 | -                             |             |             |             | 82<br>X<br>160  | 101<br>X<br>200 | 42<br>X<br>200  |             |             |                       |             |             |             |             | 70<br>X<br>160  | 95<br>X<br>200  | 30<br>X<br>200 | 17,6 |  |  |
| 615          |                          | 48                               | 38 | -  |            | 180                                 | 130 | 120                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 22,6 |  |  |
| 616          |                          | 33                               | 28 | -  |            | 150                                 | 110 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 20,2 |  |  |
| 617          | 200<br>X<br>200          | 33                               | 33 | -  | 24/25      | 160                                 | 120 | -                             |             |             |             | 82<br>X<br>200  | 141<br>X<br>200 | 82<br>X<br>200  |             |             |                       |             |             |             |             | 70<br>X<br>200  | 135<br>X<br>200 | 70<br>X<br>200 | 21,8 |  |  |
| 618          |                          | 48                               | 38 | -  |            | 180                                 | 130 | 120                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 28,0 |  |  |
| 619          |                          | 33                               | 28 | -  |            | 150                                 | 110 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 16,0 |  |  |
| 620          | 250<br>X<br>125          | 33                               | 33 | -  | 24/25      | 160                                 | 120 | -                             |             |             |             | 132<br>X<br>125 | 66<br>X<br>250  |                 |             |             |                       |             |             |             |             | 120<br>X<br>125 | 60<br>X<br>250  |                | 17,3 |  |  |
| 621          |                          | 48                               | 38 | -  |            | 180                                 | 130 | 120                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 22,1 |  |  |
| 622          |                          | 33                               | 28 | -  |            | 150                                 | 110 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 20,2 |  |  |
| 623          | 250<br>X<br>160          | 33                               | 33 | -  | 24/25      | 160                                 | 120 | -                             |             |             |             | 132<br>X<br>160 | 101<br>X<br>250 | 42<br>X<br>250  |             |             |                       |             |             |             |             | 120<br>X<br>160 | 95<br>X<br>250  | 30<br>X<br>250 | 21,8 |  |  |
| 624          |                          | 48                               | 38 | -  |            | 180                                 | 130 | 120                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 28,0 |  |  |
| 625          |                          | 33                               | 28 | -  |            | 150                                 | 110 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 25,0 |  |  |
| 626          | 250<br>X<br>200          | 33                               | 33 | -  | 24/25      | 160                                 | 120 | -                             |             |             |             | 132<br>X<br>200 | 141<br>X<br>250 | 82<br>X<br>250  |             |             |                       |             |             |             |             | 120<br>X<br>200 | 135<br>X<br>250 | 70<br>X<br>250 | 27,0 |  |  |
| 627          |                          | 48                               | 38 | -  |            | 180                                 | 130 | 120                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 34,8 |  |  |
| 628          |                          | 38                               | 33 | -  |            | 160                                 | 120 | -                             |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 36,4 |  |  |
| 629          | 250<br>X<br>250          | 38                               | 38 | -  | 30/32      | 170                                 | 130 | -                             |             |             |             | 108<br>X<br>250 | 179<br>X<br>250 | 108<br>X<br>250 |             |             |                       |             |             |             |             | 92<br>X<br>250  | 171<br>X<br>250 | 92<br>X<br>250 | 38,8 |  |  |
| 630          |                          | 48                               | 38 | -  |            | 180                                 | 130 | 120                           |             |             |             |                 |                 |                 |             |             |                       |             |             |             |             |                 |                 |                | 43,7 |  |  |

| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Sinterbuchse<br>Leader pin bushing, sintered                           |                 |                 |
|  |                 |                 |
| FS 741   | FS 751          | FS 755          |
| 46   | 47              | 48              |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 641   | FS 651          | FS 655          |
| 41   | 42              | 43              |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 453 + FS 425  | FS 457 + FS 425 | FS 458 + FS 425 |
| 51   | 52              | 53              |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 420                         | FS 419  |
| P                              | R   |

| Gestelltyp / Type of die set |  |
|------------------------------|--|
|                              |  |
|                              |  |
|                              |  |

| Position der Haltestücke / Position of holding clamps |        |
|---|--------|
|   |        |
| Pos. Z  | Pos. X |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     | Arbeitsflächen / Working area |     |             |             |             |             |             |             |             | Gewicht / Weight [kg] |             |             |             |             |             |  |  |    |      |       |  |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-------------------------------|-----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------|-------------|-------------|-------------|--|--|----|------|-------|--|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |                               |     | 46<br>41    |             |             | 47<br>42    |             |             | 48<br>43    |                       |             | 51          |             |             | 52          |  |  | 53 |      |       |  |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2                            | L3  | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B |                       | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |  |  |    |      |       |  |
| 631          |                          | 33                               | 28 | -  |            | 150                                 | 110                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    | 24,0 |       |  |
| 632          | 300                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 33                               | 33 | -  | 24/25      | 160                                 | 120                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 25,9  |  |
|              | 160                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 633          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 33,4  |  |
| 634          |                          | 33                               | 28 | -  |            | 150                                 | 110                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 29,8  |  |
| 635          | 300                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 33                               | 33 | -  | 24/25      | 160                                 | 120                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | 200                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 636          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 41,5  |  |
| 637          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 43,3  |  |
| 638          | 300                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | 250                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 639          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 52,5  |  |
| 640          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 52,0  |  |
| 641          | 300                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | 300                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 642          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 62,5  |  |
| 643          |                          | 33                               | 28 | -  |            | 150                                 | 110                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 34,6  |  |
| 644          | 350                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 33                               | 33 | -  | 24/25      | 160                                 | 120                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | 200                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 645          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 48,3  |  |
| 646          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 50,5  |  |
| 647          | 350                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | 250                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 648          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 61,0  |  |
| 649          |                          | 48                               | 38 | -  |            | 190                                 | 140                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 74,0  |  |
| 650          | 350                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 48                               | 48 | -  | 40/42      | 200                                 | 150                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | 300                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 651          |                          | 58                               | 48 | -  |            | 210                                 | 150                           | 140 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 90,5  |  |
| 652          |                          | 48                               | 38 | -  |            | 190                                 | 140                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 86,0  |  |
| 653          | 350                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 48                               | 48 | -  | 40/42      | 200                                 | 150                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | 350                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 654          |                          | 58                               | 48 | -  |            | 210                                 | 150                           | 140 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 105,0 |  |
| 655          |                          | 33                               | 28 | -  |            | 150                                 | 110                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 39,4  |  |
| 656          | 400                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 33                               | 33 | -  | 24/25      | 160                                 | 120                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | 200                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 657          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 55,0  |  |
| 658          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 57,5  |  |
| 659          | 400                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | X                        | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
|              | 250                      |                                  |    |    |            |                                     |                               |     |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      |       |  |
| 660          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |             |             |             |             |                       |             |             |             |             |             |  |  |    |      | 69,0  |  |



| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Sinterbuchse<br>Leader pin bushing, sintered                           |                 |                 |
|  |                 |                 |
| FS 741   | FS 751          | FS 755          |
| 46   | 47              | 48              |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 641   | FS 651          | FS 655          |
| 41   | 42              | 43              |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 453 + FS 425  | FS 457 + FS 425 | FS 458 + FS 425 |
| 51   | 52              | 53              |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 420                         | FS 419  |
| P                              | R   |

| Gestelltyp / Type of die set |  |
|------------------------------|--|
|                              |  |
|                              |  |
|                              |  |

| Position der Haltestücke / Position of holding clamps |        |
|---|--------|
|   |        |
| Pos. Z  | Pos. X |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     | Arbeitsflächen / Working area |     |             |             |             |             |             |             |          | Gewicht / Weight [kg] |     |              |              |              |  |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-------------------------------|-----|-------------|-------------|-------------|-------------|-------------|-------------|----------|-----------------------|-----|--------------|--------------|--------------|--|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |                               |     | 46<br>41    |             |             | 47<br>42    |             |             | 48<br>43 |                       |     | 51<br>X<br>B | 52<br>X<br>A | 53<br>X<br>A |  |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2                            | L3  | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |          |                       |     |              |              |              |  |
| 661          |                          | 48                               | 38 | -  |            | 190                                 | 140                           | -   |             |             |             | 238         | 219         | 138         | 222      | 211                   | 122 | 84,0         |              |              |  |
| 662          | 400                      | 48                               | 48 | -  | 40/42      | 200                                 | 150                           | -   |             |             |             | X           | X           | X           | X        | X                     | X   | 93,5         |              |              |  |
|              | 300                      | 58                               | 48 | -  |            | 210                                 | 150                           | 140 |             |             |             | 300         | 400         | 400         | 300      | 400                   | 400 | 103,0        |              |              |  |
| 663          |                          | 48                               | 38 | -  |            | 190                                 | 140                           | -   |             |             |             |             |             |             |          |                       |     | 97,5         |              |              |  |
| 664          | 400                      | 48                               | 48 | -  | 40/42      | 200                                 | 150                           | -   |             |             |             | 238         | 269         | 188         | 222      | 261                   | 172 | 109,0        |              |              |  |
| 665          | X                        | 48                               | 48 | -  | 40/42      | 200                                 | 150                           | -   |             |             |             | X           | X           | X           | X        | X                     | X   | 120,0        |              |              |  |
| 666          | 350                      | 58                               | 48 | -  |            | 210                                 | 150                           | 140 |             |             |             | 350         | 400         | 400         | 350      | 400                   | 400 | 111,0        |              |              |  |
| 667          | 400                      | 48                               | 38 | -  |            | 190                                 | 140                           | -   |             |             |             | 238         | 319         | 238         | 222      | 311                   | 222 | 124,0        |              |              |  |
| 668          | X                        | 48                               | 48 | -  | 40/42      | 200                                 | 150                           | -   |             |             |             | X           | X           | X           | X        | X                     | X   | 137,0        |              |              |  |
| 669          | 400                      | 58                               | 48 | -  |            | 210                                 | 150                           | 140 |             |             |             | 400         | 400         | 400         | 400      | 400                   | 400 | 73,0         |              |              |  |
| 670          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |             |             |             |          |                       |     | 78,0         |              |              |  |
| 671          | 500                      | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             | 358         | 179         | 108         | 342      | 171                   | 92  | 87,5         |              |              |  |
| 672          | X                        | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             | X           | X           | X           | X        | X                     | X   | 105,0        |              |              |  |
| 673          | 250                      | 48                               | 38 | -  |            | 190                                 | 140                           | -   |             |             |             | 250         | 500         | 500         | 250      | 500                   | 500 | 116,0        |              |              |  |
| 674          | 500                      | 48                               | 48 | -  | 40/42      | 200                                 | 150                           | -   |             |             |             | 338         | 219         | 138         | 322      | 211                   | 122 | 128,0        |              |              |  |
| 675          | X                        | 58                               | 48 | -  |            | 210                                 | 150                           | 140 |             |             |             | 300         | 500         | 500         | 300      | 500                   | 500 | 122,0        |              |              |  |
| 676          | 300                      | 48                               | 38 | -  |            | 190                                 | 140                           | -   |             |             |             |             |             |             |          |                       |     | 135,0        |              |              |  |
| 677          | 500                      | 48                               | 48 | -  | 40/42      | 200                                 | 150                           | -   |             |             |             | 338         | 269         | 188         | 322      | 261                   | 172 | 149,0        |              |              |  |
| 678          | X                        | 58                               | 48 | -  |            | 210                                 | 150                           | 140 |             |             |             | 350         | 500         | 500         | 350      | 500                   | 500 | 138,0        |              |              |  |
| 679          | 350                      | 48                               | 38 | -  |            | 190                                 | 140                           | -   |             |             |             |             |             |             |          |                       |     | 154,0        |              |              |  |
| 680          | 500                      | 48                               | 48 | -  | 40/42      | 200                                 | 150                           | -   |             |             |             | 338         | 319         | 238         | 322      | 311                   | 222 | 170,0        |              |              |  |
| 681          | X                        | 58                               | 48 | -  |            | 210                                 | 150                           | 140 |             |             |             | X           | X           | X           | X        | X                     | X   | 213,0        |              |              |  |
| 682          | 400                      | 58                               | 48 | -  |            | 220                                 | 160                           | -   |             |             |             | 306         | 403         | 306         | 290      | 395                   | 290 | 233,0        |              |              |  |
| 683          | 500                      | 58                               | 58 | -  | 50/52      | 230                                 | 170                           | -   |             |             |             | X           | X           | X           | X        | X                     | X   | 252,0        |              |              |  |
| 684          | 500                      | 68                               | 58 | -  |            | 240                                 | 170                           | 160 |             |             |             |             |             |             |          |                       |     | 155,0        |              |              |  |
| 685          | 600                      | 58                               | 48 | -  |            | 220                                 | 160                           | -   |             |             |             | 406         | 203         | 106         | 390      | 195                   | 90  | 169,0        |              |              |  |
| 686          | X                        | 58                               | 58 | -  | 50/52      | 230                                 | 170                           | -   |             |             |             | X           | X           | X           | X        | X                     | X   | 183,0        |              |              |  |
| 687          | 300                      | 68                               | 58 | -  |            | 240                                 | 170                           | 160 |             |             |             | 300         | 600         | 600         | 300      | 600                   | 600 | 180,0        |              |              |  |
| 688          | 600                      | 58                               | 48 | -  |            | 220                                 | 160                           | -   |             |             |             |             |             |             |          |                       |     | 196,0        |              |              |  |
| 689          | X                        | 58                               | 58 | -  | 50/52      | 230                                 | 170                           | -   |             |             |             | 406         | 253         | 156         | 390      | 245                   | 140 | 213,0        |              |              |  |
| 690          | 350                      | 68                               | 58 | -  |            | 240                                 | 170                           | 160 |             |             |             | 350         | 600         | 600         | 350      | 600                   | 600 |              |              |              |  |

# Säulengestelle aus Stahl, 2 Platten, 2 Säulen, Typ A-C-D

## Steel die sets, 2 plates, 2 posts, types A-C-D



### SÄULENGESTELLE / DIE SETS

| Buchsentyp / Type of bushing   |                 |                 |  |
|--|-----------------|-----------------|--|
| Sinterbuchse<br>Leader pin bushing, sintered                           |                 |                 |  |
|  |                 |                 |  |
| FS 741   | FS 751          | FS 755          |  |
| 46   | 47              | 48              |  |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |  |
|  |                 |                 |  |
| FS 641   | FS 651          | FS 655          |  |
| 41   | 42              | 43              |  |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |  |
|  |                 |                 |  |
| FS 453 + FS 425  | FS 457 + FS 425 | FS 458 + FS 425 |  |
| 51   | 52              | 53              |  |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 420                         | FS 419  |
| P                              | R   |

| Gestelltyp / Type of die set |  |
|------------------------------|--|
|                              |  |
|                              |  |
|                              |  |

| Position der Haltestücke / Position of holding clamps |        |
|---|--------|
|   |        |
| Pos. Z  | Pos. X |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |       |                                     |     |     | Arbeitsflächen / Working area |             |             |             |             |             |             |             |             | Gewicht / Weight [kg] |                |  |  |
|--------------|--------------------------|----------------------------------|----|----|-------|-------------------------------------|-----|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|----------------|--|--|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø     | Säulenlänge<br>Length of leader pin |     |     | 46<br>41                      |             |             | 47<br>42    |             |             | 48<br>43    |             |             |                       | 51<br>52<br>53 |  |  |
|              |                          | C1                               | C2 | C3 |       | d1/d2                               | L1  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A |                       | c<br>X<br>A    |  |  |
| 691          | 600                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 406         | 303         | 206         | 390         | 295         | 190         | 205,0                 |                |  |  |
| 692          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 224,0                 |                |  |  |
|              | 400                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 400         | 600         | 600         | 400         | 600         | 600         | 242,0                 |                |  |  |
| 693          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |
| 694          | 600                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 406         | 403         | 306         | 390         | 395         | 290         | 254,0                 |                |  |  |
| 695          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 278,0                 |                |  |  |
|              | 500                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 500         | 600         | 600         | 500         | 600         | 600         | 302,0                 |                |  |  |
| 696          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |
| 697          | 600                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 406         | 503         | 406         | 390         | 495         | 390         | 305,0                 |                |  |  |
| 698          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 333,0                 |                |  |  |
|              | 600                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 600         | 600         | 600         | 600         | 600         | 600         | 361,0                 |                |  |  |
| 699          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |
| 700          | 700                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 506         | 253         | 156         | 490         | 245         | 140         | 209,0                 |                |  |  |
| 701          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 228,0                 |                |  |  |
|              | 350                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 350         | 700         | 700         | 350         | 700         | 700         | 247,0                 |                |  |  |
| 702          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |
| 703          | 700                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 506         | 303         | 206         | 490         | 295         | 190         | 238,0                 |                |  |  |
| 704          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 260,0                 |                |  |  |
|              | 400                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 400         | 700         | 700         | 400         | 700         | 700         | 282,0                 |                |  |  |
| 705          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |
| 706          | 700                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 506         | 403         | 306         | 490         | 395         | 290         | 296,0                 |                |  |  |
| 707          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 324,0                 |                |  |  |
|              | 500                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 500         | 700         | 700         | 500         | 700         | 700         | 351,0                 |                |  |  |
| 708          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |
| 709          | 700                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 506         | 503         | 406         | 490         | 495         | 390         | 354,0                 |                |  |  |
| 710          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 388,0                 |                |  |  |
|              | 600                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 600         | 700         | 700         | 600         | 700         | 700         | 420,0                 |                |  |  |
| 711          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |
| 712          | 800                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 606         | 303         | 206         | 590         | 295         | 190         | 271,0                 |                |  |  |
| 713          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 296,0                 |                |  |  |
|              | 400                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 400         | 800         | 800         | 400         | 800         | 800         | 321,0                 |                |  |  |
| 714          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |
| 715          | 800                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 606         | 403         | 306         | 590         | 395         | 290         | 338,0                 |                |  |  |
| 716          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 369,0                 |                |  |  |
|              | 500                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 500         | 800         | 800         | 500         | 800         | 800         | 400,0                 |                |  |  |
| 717          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |
| 718          | 800                      | 58                               | 48 | -  |       | 220                                 | 160 | -   |                               |             |             | 606         | 503         | 406         | 590         | 495         | 390         | 404,0                 |                |  |  |
| 719          | X                        | 58                               | 58 | -  | 50/52 | 230                                 | 170 | -   |                               |             |             | X           | X           | X           | X           | X           | X           | 442,0                 |                |  |  |
|              | 600                      | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             | 600         | 800         | 800         | 600         | 800         | 800         | 480,0                 |                |  |  |
| 720          |                          | 68                               | 58 | -  |       | 240                                 | 170 | 160 |                               |             |             |             |             |             |             |             |             |                       |                |  |  |

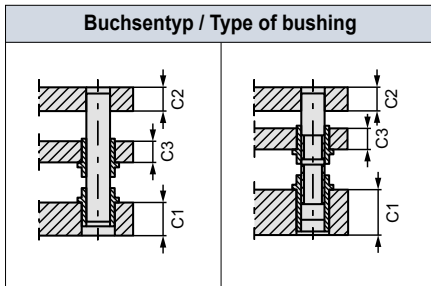
# Säulengestelle aus Stahl, 3 Platten, 2 Säulen, Typ A-C-D



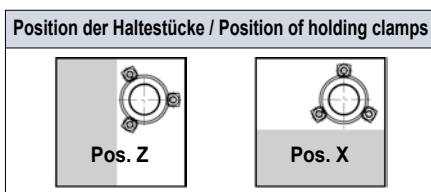
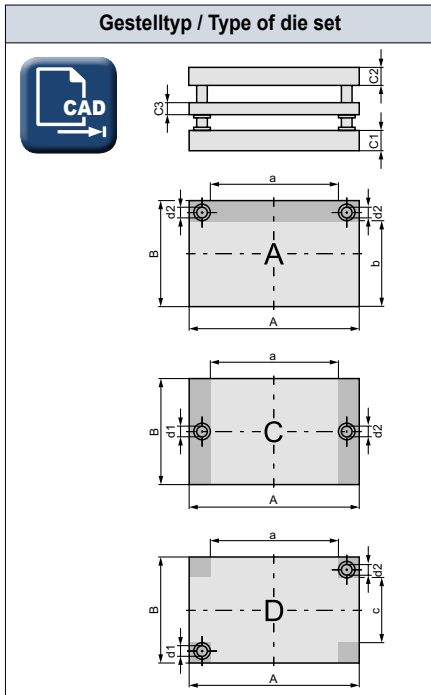
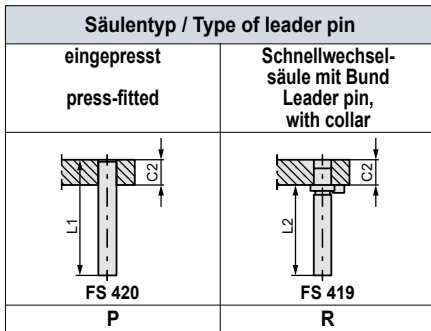
[SG]

# Steel die sets, 3 plates, 2 posts, types A-C-D

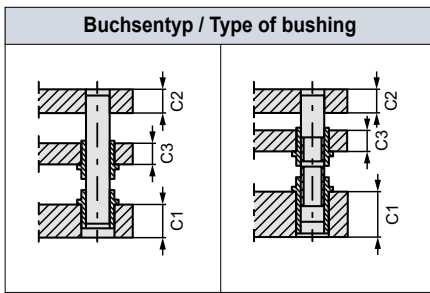
SÄULENGESTELLE / DIE SETS



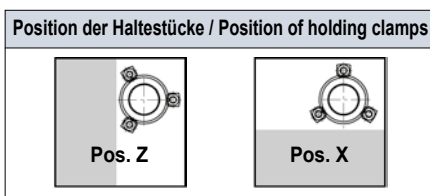
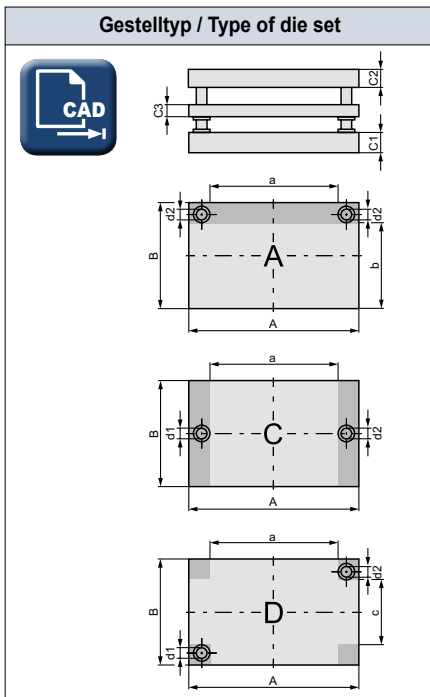
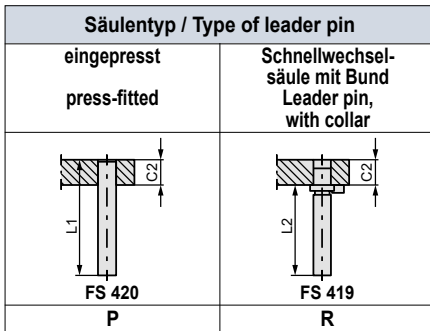
| Sinterbuchse<br>Leader pin bushing, sintered                           |                     |
|--|---------------------|
| C1: FS 741   | C1: FS 732          |
| C3: FS 731   | C3: FS 731          |
| 88   | 87                  |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                     |
| C1: FS 641   | C1: FS 632          |
| C3: FS 631   | C3: FS 631          |
| 71   | 72                  |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425  | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425  | C3: FS 457 + FS 425 |
| 91   | 92                  |



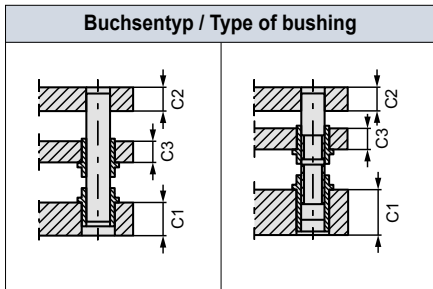
| Größe / Size |     | Abmessungen / Dimensions         |    |    |    |                                     |     | Arbeitsflächen / Working area |          |             |             |             |             | Gewicht / Weight [kg] |             |             |             |             |             |     |     |      |
|--------------|-----|----------------------------------|----|----|----|-------------------------------------|-----|-------------------------------|----------|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------|-------------|-------------|-------------|-----|-----|------|
|              |     | Plattenstärke<br>Plate thickness |    |    | Ø  | Säulenlänge<br>Length of leader pin |     |                               | 88<br>71 |             |             | 87<br>72    |             |                       | 91          |             |             | 92          |             |     |     |      |
|              |     | C1                               | C2 | C3 |    | d1/d2                               | L1  | L2                            | L3       | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B |                       | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |     |     |      |
| 601          |     | 28                               | 23 |    |    | 140                                 | 120 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     | 9,4 |      |
| 602          | 125 | X                                | 38 | 28 | 18 | 18/19                               | 160 | 130                           | -        |             |             |             | 27          | 76                    | 27          |             |             |             |             | 70  |     | 11,2 |
|              | 125 |                                  | 38 | 28 |    |                                     |     |                               |          |             |             | 125         | 125         | 125                   |             |             |             |             | 125         |     |     | 12,4 |
| 603          |     | 38                               | 38 |    |    | 170                                 | 130 | 120                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |
| 604          |     | 28                               | 23 |    |    | 140                                 | 120 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     |     | 11,7 |
| 605          | 160 | X                                | 38 | 28 | 18 | 18/19                               | 160 | 130                           | -        |             |             |             | 62          | 76                    | 27          |             |             |             | 50          | 70  |     | 14,2 |
|              | 125 |                                  | 38 | 28 |    |                                     |     |                               |          |             |             | 125         | 160         | 160                   | 125         | 160         |             |             |             |     |     | 15,8 |
| 606          |     | 38                               | 38 |    |    | 170                                 | 130 | 120                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |
| 607          |     | 28                               | 23 |    |    | 140                                 | 120 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     |     | 14,8 |
| 608          | 160 | X                                | 38 | 28 | 18 | 18/19                               | 160 | 130                           | -        |             |             |             | 62          | 111                   | 62          |             |             |             | 50          | 105 | 50  | 17,8 |
|              | 160 |                                  | 38 | 28 |    |                                     |     |                               |          |             |             | 160         | 160         | 160                   | 160         | 160         |             |             | 160         | 160 | 160 | 19,8 |
| 609          |     | 38                               | 38 |    |    | 170                                 | 130 | 120                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |
| 610          |     | 28                               | 23 |    |    | 140                                 | 120 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     |     | 14,4 |
| 611          | 200 | X                                | 38 | 28 | 18 | 18/19                               | 160 | 130                           | -        |             |             |             | 102         | 76                    | 27          |             |             |             | 90          | 70  |     | 17,4 |
|              | 125 |                                  | 38 | 28 |    |                                     |     |                               |          |             |             | 125         | 200         | 200                   | 125         | 200         |             |             | 125         | 200 |     | 19,4 |
| 612          |     | 38                               | 38 |    |    | 170                                 | 130 | 120                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |
| 613          |     | 33                               | 28 |    |    | 160                                 | 130 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     |     | 22,3 |
| 614          | 200 | X                                | 48 | 38 | 23 | 24/25                               | 190 | 150                           | -        |             |             |             | 82          | 101                   | 42          |             |             |             | 70          | 95  |     | 28,4 |
|              | 160 |                                  | 48 | 38 |    |                                     |     |                               |          |             |             | 160         | 200         | 200                   | 160         | 200         |             |             | 160         | 200 |     | 30,9 |
| 615          |     | 48                               | 48 |    |    | 200                                 | 150 | 140                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |
| 616          |     | 33                               | 28 |    |    | 160                                 | 130 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     |     | 27,5 |
| 617          | 200 | X                                | 48 | 38 | 23 | 24/25                               | 190 | 150                           | -        |             |             |             | 82          | 141                   | 82          |             |             |             | 70          | 135 | 70  | 35,2 |
|              | 200 |                                  | 48 | 38 |    |                                     |     |                               |          |             |             | 200         | 200         | 200                   | 200         | 200         |             |             | 200         | 200 | 200 | 38,4 |
| 618          |     | 48                               | 48 |    |    | 200                                 | 150 | 140                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |
| 619          |     | 33                               | 28 |    |    | 160                                 | 130 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     |     | 21,8 |
| 620          | 250 | X                                | 48 | 38 | 23 | 24/25                               | 190 | 150                           | -        |             |             |             | 132         | 66                    |             |             |             |             | 120         | 60  |     | 27,8 |
|              | 125 |                                  | 48 | 38 |    |                                     |     |                               |          |             |             | 125         | 250         | 125                   | 250         |             |             |             | 125         | 250 |     | 30,2 |
| 621          |     | 48                               | 48 |    |    | 200                                 | 150 | 140                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |
| 622          |     | 33                               | 28 |    |    | 160                                 | 130 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     |     | 27,5 |
| 623          | 250 | X                                | 48 | 38 | 23 | 24/25                               | 190 | 150                           | -        |             |             |             | 132         | 101                   | 42          |             |             |             | 120         | 95  |     | 35,2 |
|              | 160 |                                  | 48 | 38 |    |                                     |     |                               |          |             |             | 160         | 250         | 250                   | 160         | 250         |             |             | 160         | 250 |     | 38,4 |
| 624          |     | 48                               | 48 |    |    | 200                                 | 150 | 140                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |
| 625          |     | 33                               | 28 |    |    | 160                                 | 130 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     |     | 34,2 |
| 626          | 250 | X                                | 48 | 38 | 23 | 24/25                               | 190 | 150                           | -        |             |             |             | 132         | 141                   | 82          |             |             |             | 120         | 135 | 70  | 43,8 |
|              | 200 |                                  | 48 | 38 |    |                                     |     |                               |          |             |             | 200         | 250         | 250                   | 200         | 250         |             |             | 200         | 250 | 250 | 47,7 |
| 627          |     | 48                               | 48 |    |    | 200                                 | 150 | 140                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |
| 628          |     | 38                               | 33 |    |    | 170                                 | 140 | -                             |          |             |             |             |             |                       |             |             |             |             |             |     |     | 50,5 |
| 629          | 250 | X                                | 48 | 38 | 28 | 30/32                               | 190 | 150                           | -        |             |             |             | 108         | 179                   | 108         |             |             |             | 92          | 171 | 92  | 57,5 |
|              | 250 |                                  | 48 | 38 |    |                                     |     |                               |          |             |             | 250         | 250         | 250                   | 250         | 250         |             |             | 250         | 250 | 250 | 62,5 |
| 630          |     | 48                               | 48 |    |    | 200                                 | 150 | 140                           |          |             |             |             |             |                       |             |             |             |             |             |     |     |      |



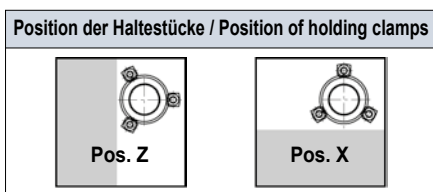
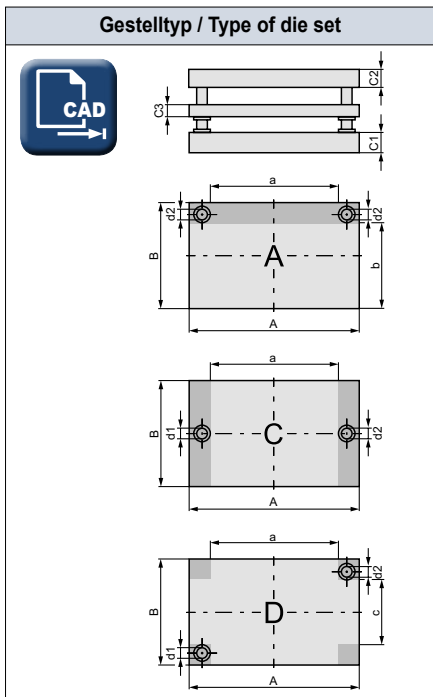
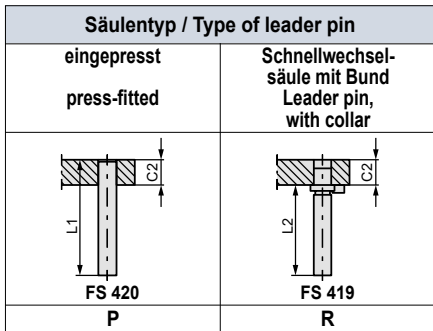
|  |                     |
|--|---------------------|
| <b>Sinterbuche</b><br>Leader pin bushing, sintered                           |                     |
| C1: FS 741   | C1: FS 732          |
| C3: FS 731   | C3: FS 731          |
| 88   | 87                  |
| <b>Stahlbuche mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |                     |
| C1: FS 641   | C1: FS 632          |
| C3: FS 631   | C3: FS 631          |
| 71   | 72                  |
| <b>Stahlbuche mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425  | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425  | C3: FS 457 + FS 425 |
| 91   | 92                  |



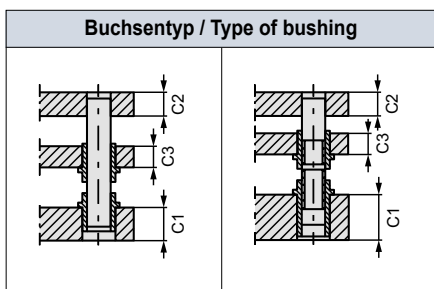
| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     | Arbeitsflächen / Working area |     |             |             |             |             |             |             | Gewicht / Weight [kg] |     |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-------------------------------|-----|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-----|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |                               |     | 88<br>71 72 |             |             | 91 92       |             |             |                       |     |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2                            | L3  | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |                       |     |       |
| 631          |                          | 33                               | 28 |    |            | 160                                 | 130                           | -   |             |             |             |             |             |             |                       |     | 32,8  |
| 632          | 300<br>X<br>160          | 48                               | 38 | 23 | 24/25      | 190                                 | 150                           | -   |             |             | 182         | 101         | 42          | 170         | 95                    |     | 42,1  |
| 633          |                          | 48                               | 48 |    |            | 200                                 | 150                           | 140 |             |             | 160         | 300         | 300         | 160         | 300                   |     | 45,9  |
| 634          |                          | 33                               | 28 |    |            | 160                                 | 130                           | -   |             |             |             |             |             |             |                       |     | 40,7  |
| 635          | 300<br>X<br>200          | 48                               | 38 | 23 | 24/25      | 190                                 | 150                           | -   |             |             | 182         | 141         | 82          | 170         | 135                   | 76  | 52,5  |
| 636          |                          | 48                               | 48 |    |            | 200                                 | 150                           | 140 |             |             | 200         | 300         | 300         | 200         | 300                   | 300 | 57,5  |
| 637          |                          | 38                               | 33 |    |            | 170                                 | 140                           | -   |             |             |             |             |             |             |                       |     | 60,0  |
| 638          | 300<br>X<br>250          | 48                               | 38 | 28 | 30/32      | 190                                 | 150                           | -   |             |             | 158         | 179         | 108         | 142         | 171                   | 92  | 69,0  |
| 639          |                          | 48                               | 48 |    |            | 200                                 | 150                           | 140 |             |             | 250         | 300         | 300         | 250         | 300                   | 300 | 74,5  |
| 640          |                          | 38                               | 33 |    |            | 170                                 | 140                           | -   |             |             |             |             |             |             |                       |     | 71,5  |
| 641          | 300<br>X<br>300          | 48                               | 38 | 28 | 30/32      | 190                                 | 150                           | -   |             |             | 158         | 229         | 158         | 142         | 221                   | 142 | 82,5  |
| 642          |                          | 48                               | 48 |    |            | 200                                 | 150                           | 140 |             |             | 300         | 300         | 300         | 300         | 300                   | 300 | 89,5  |
| 643          |                          | 33                               | 28 |    |            | 160                                 | 130                           | -   |             |             |             |             |             |             |                       |     | 47,3  |
| 644          | 350<br>X<br>200          | 48                               | 38 | 23 | 24/25      | 190                                 | 150                           | -   |             |             | 232         | 141         | 82          | 220         | 135                   | 70  | 60,5  |
| 645          |                          | 48                               | 48 |    |            | 200                                 | 150                           | 140 |             |             | 200         | 350         | 350         | 200         | 350                   | 350 | 66,5  |
| 646          |                          | 38                               | 33 |    |            | 170                                 | 140                           | -   |             |             |             |             |             |             |                       |     | 69,5  |
| 647          | 350<br>X<br>250          | 48                               | 38 | 28 | 30/32      | 190                                 | 150                           | -   |             |             | 208         | 179         | 108         | 192         | 171                   | 92  | 80,0  |
| 648          |                          | 48                               | 48 |    |            | 200                                 | 150                           | 140 |             |             | 250         | 350         | 350         | 250         | 350                   | 350 | 87,0  |
| 649          |                          | 48                               | 38 |    |            | 200                                 | 160                           | -   |             |             |             |             |             |             |                       |     | 101,0 |
| 650          | 350<br>X<br>300          | 58                               | 48 | 33 | 40/42      | 220                                 | 170                           | -   |             |             | 188         | 219         | 138         | 172         | 211                   | 122 | 118,0 |
| 651          |                          | 58                               | 58 |    |            | 230                                 | 170                           | 160 |             |             | 300         | 350         | 350         | 300         | 350                   | 350 | 126,0 |
| 652          |                          | 48                               | 38 |    |            | 200                                 | 160                           | -   |             |             |             |             |             |             |                       |     | 118,0 |
| 653          | 350<br>X<br>350          | 58                               | 48 | 33 | 40/42      | 220                                 | 170                           | -   |             |             | 188         | 269         | 188         | 172         | 261                   | 172 | 137,0 |
| 654          |                          | 58                               | 58 |    |            | 230                                 | 170                           | 160 |             |             | 350         | 350         | 350         | 350         | 350                   | 350 | 147,0 |
| 655          |                          | 33                               | 28 |    |            | 160                                 | 130                           | -   |             |             |             |             |             |             |                       |     | 54,0  |
| 656          | 400<br>X<br>200          | 48                               | 38 | 23 | 24/25      | 190                                 | 150                           | -   |             |             | 282         | 141         | 82          | 270         | 135                   | 70  | 69,5  |
| 657          |                          | 48                               | 48 |    |            | 200                                 | 150                           | 130 |             |             | 200         | 400         | 400         | 200         | 400                   | 400 | 75,0  |
| 658          |                          | 38                               | 33 |    |            | 170                                 | 140                           | -   |             |             |             |             |             |             |                       |     | 79,5  |
| 659          | 400<br>X<br>250          | 48                               | 38 | 28 | 30/32      | 190                                 | 150                           | -   |             |             | 258         | 179         | 108         | 242         | 171                   | 92  | 91,0  |
| 660          |                          | 48                               | 48 |    |            | 200                                 | 150                           | 140 |             |             | 250         | 400         | 400         | 250         | 400                   | 400 | 99,0  |



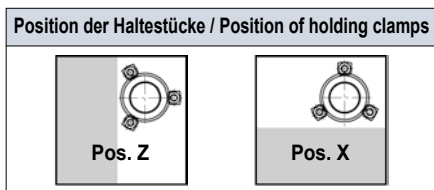
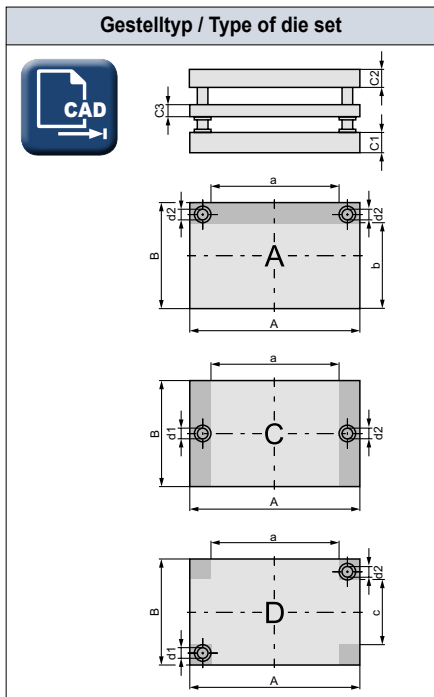
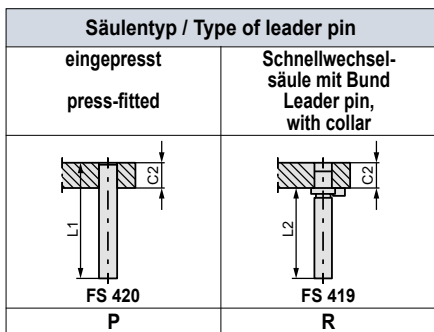
|  |  |
|--|--|
| <b>Sinterbuchse<br/>Leader pin bushing, sintered</b>                           |  |
| C1: FS 741<br>C3: FS 731<br>88   | C1: FS 732<br>C3: FS 731<br>87                   |
| <b>Stahlbuchse mit Bronzeplattierung<br/>Leader pin bushing, bronze plated</b> |  |
| C1: FS 641<br>C3: FS 631<br>71   | C1: FS 632<br>C3: FS 631<br>72                   |
| <b>Stahlbuchse mit Ms-Käfig<br/>Leader pin bushing with ball cage</b>          |  |
| C1: FS 458 + FS 425<br>C3: FS 457 + FS 425<br>91                               | C1: FS 453 + FS 425<br>C3: FS 457 + FS 425<br>92 |



| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |                 |                 |                 |                 |                 | Gewicht / Weight [kg] |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------------|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 88<br>71 72 |             |             | 91 92           |                 |                 |                 |                 |                       |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B     | b<br>X<br>A     | c<br>X<br>A     |                 |                 |                       |       |
| 661          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |                 |                 |                 |                 |                 | 115,0                 |       |
| 662          | 400<br>X<br>300          | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 238<br>X<br>300 | 219<br>X<br>400 | 138<br>X<br>400 | 222<br>X<br>300 | 211<br>X<br>400 | 122<br>X<br>400       | 134,0 |
| 663          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |                 |                 |                 |                 |                 | 144,0                 |       |
| 664          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |                 |                 |                 |                 |                 | 134,0                 |       |
| 665          | 400<br>X<br>350          | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 238<br>X<br>350 | 269<br>X<br>400 | 188<br>X<br>400 | 222<br>X<br>350 | 261<br>X<br>400 | 172<br>X<br>400       | 156,0 |
| 666          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |                 |                 |                 |                 |                 | 167,0                 |       |
| 667          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |                 |                 |                 |                 |                 | 153,0                 |       |
| 668          | 400<br>X<br>400          | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 238<br>X<br>400 | 319<br>X<br>400 | 238<br>X<br>400 | 222<br>X<br>400 | 311<br>X<br>400 | 222<br>X<br>400       | 178,0 |
| 669          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |                 |                 |                 |                 |                 | 190,0                 |       |
| 670          |                          | 38                               | 33 |    |            | 170                                 | 140 | -                             |             |             |             |                 |                 |                 |                 |                 | 99,0                  |       |
| 671          | 500<br>X<br>250          | 48                               | 38 | 28 | 30/32      | 190                                 | 150 | -                             |             |             |             | 358<br>X<br>250 | 179<br>X<br>500 | 108<br>X<br>500 | 342<br>X<br>250 | 171<br>X<br>500 | 92<br>X<br>500        | 114,0 |
| 672          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |             |                 |                 |                 |                 |                 | 124,0                 |       |
| 673          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |                 |                 |                 |                 |                 | 143,0                 |       |
| 674          | 500<br>X<br>300          | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 338<br>X<br>300 | 219<br>X<br>500 | 138<br>X<br>500 | 322<br>X<br>300 | 211<br>X<br>500 | 122<br>X<br>500       | 167,0 |
| 675          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |                 |                 |                 |                 |                 | 179,0                 |       |
| 676          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |                 |                 |                 |                 |                 | 167,0                 |       |
| 677          | 500<br>X<br>350          | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 338<br>X<br>350 | 269<br>X<br>500 | 188<br>X<br>500 | 322<br>X<br>350 | 261<br>X<br>500 | 172<br>X<br>500       | 194,0 |
| 678          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |                 |                 |                 |                 |                 | 208,0                 |       |
| 679          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |                 |                 |                 |                 |                 | 190,0                 |       |
| 680          | 500<br>X<br>400          | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 338<br>X<br>400 | 319<br>X<br>500 | 238<br>X<br>500 | 322<br>X<br>400 | 311<br>X<br>500 | 222<br>X<br>500       | 222,0 |
| 681          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |                 |                 |                 |                 |                 | 237,0                 |       |
| 682          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |                 |                 |                 |                 |                 | 287,0                 |       |
| 683          | 500<br>X<br>500          | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 306<br>X<br>500 | 403<br>X<br>500 | 306<br>X<br>500 | 290<br>X<br>500 | 395<br>X<br>500 | 290<br>X<br>500       | 327,0 |
| 684          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |                 |                 |                 |                 |                 | 346,0                 |       |
| 685          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |                 |                 |                 |                 |                 | 208,0                 |       |
| 686          | 600<br>X<br>300          | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 406<br>X<br>300 | 203<br>X<br>600 | 106<br>X<br>600 | 390<br>X<br>300 | 195<br>X<br>600 | 90<br>X<br>600        | 237,0 |
| 687          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |                 |                 |                 |                 |                 | 251,0                 |       |
| 688          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |                 |                 |                 |                 |                 | 242,0                 |       |
| 689          | 600<br>X<br>350          | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 406<br>X<br>350 | 253<br>X<br>600 | 156<br>X<br>600 | 390<br>X<br>350 | 245<br>X<br>600 | 140<br>X<br>600       | 275,0 |
| 690          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |                 |                 |                 |                 |                 | 292,0                 |       |



|  |                     |
|--|---------------------|
| <b>Sinterbuche</b><br>Leader pin bushing, sintered                           |                     |
| C1: FS 741   | C1: FS 732          |
| C3: FS 731   | C3: FS 731          |
| 88   | 87                  |
| <b>Stahlbuche mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |                     |
| C1: FS 641   | C1: FS 632          |
| C3: FS 631   | C3: FS 631          |
| 71   | 72                  |
| <b>Stahlbuche mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425  | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425  | C3: FS 457 + FS 425 |
| 91   | 92                  |



| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |             |             |             |     | Gewicht / Weight [kg] |       |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|-----------------------|-------|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 88<br>71 72 |             |             | 91 92       |             |             |     |                       |       |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |     |                       |       |       |
| 691          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       | 276,0 |       |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 692          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 406         | 303         | 206         | 390 | 295                   | 190   | 314,0 |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             | 400         | 600         | 600         | 400 | 600                   | 600   |       |
| 693          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 333,0 |
| 694          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       |       | 344,0 |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 695          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 406         | 403         | 306         | 390 | 395                   | 290   | 391,0 |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             | 500         | 600         | 600         | 500 | 600                   | 600   |       |
| 696          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 415,0 |
| 697          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       |       | 412,0 |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 698          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 406         | 503         | 406         | 390 | 495                   | 390   | 468,0 |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             | 600         | 600         | 600         | 600 | 600                   | 600   |       |
| 699          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 497,0 |
| 700          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       |       | 282,0 |
|              | 700                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 701          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 506         | 253         | 156         | 490 | 245                   | 140   | 320,0 |
|              | 350                      |                                  |    |    |            |                                     |     |                               |             |             |             | 350         | 700         | 700         | 350 | 700                   | 700   |       |
| 702          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 340,0 |
| 703          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       |       | 321,0 |
|              | 700                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 704          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 506         | 303         | 206         | 490 | 295                   | 190   | 365,0 |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             | 400         | 700         | 700         | 400 | 700                   | 700   |       |
| 705          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 387,0 |
| 706          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       |       | 400,0 |
|              | 700                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 707          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 506         | 403         | 306         | 490 | 395                   | 290   | 455,0 |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             | 500         | 700         | 700         | 500 | 700                   | 700   |       |
| 708          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 483,0 |
| 709          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       |       | 480,0 |
|              | 700                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 710          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 506         | 503         | 406         | 490 | 495                   | 390   | 545,0 |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             | 600         | 700         | 700         | 600 | 700                   | 700   |       |
| 711          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 579,0 |
| 712          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       |       | 366,0 |
|              | 800                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 713          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 606         | 303         | 206         | 590 | 295                   | 190   | 417,0 |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             | 400         | 800         | 800         | 400 | 800                   | 800   |       |
| 714          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 442,0 |
| 715          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       |       | 457,0 |
|              | 800                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 716          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 606         | 403         | 306         | 590 | 395                   | 290   | 520,0 |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             | 500         | 800         | 800         | 500 | 800                   | 800   |       |
| 717          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 551,0 |
| 718          |                          | 58                               | 48 |    |            | 230                                 | 180 | -                             |             |             |             |             |             |             |     |                       |       | 547,0 |
|              | 800                      |                                  |    |    |            |                                     |     |                               |             |             |             |             |             |             |     |                       |       |       |
| 719          | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -                             |             |             |             | 606         | 503         | 406         | 590 | 495                   | 390   | 623,0 |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             | 600         | 800         | 800         | 600 | 800                   | 800   |       |
| 720          |                          | 68                               | 68 |    |            | 260                                 | 200 | 180                           |             |             |             |             |             |             |     |                       |       | 661,0 |

# Säulengestelle aus Stahl, 2 Platten, 4 Säulen, Typ Q

## Steel die sets, 2 plates, 4 posts, type Q



[SG]

### SÄULENGESTELLE / DIE SETS

| Buchsentyp / Type of bushing   |                 |                 |  |
|--|-----------------|-----------------|--|
| Sinterbuchse<br>Leader pin bushing, sintered                           |                 |                 |  |
|  |                 |                 |  |
| FS 741   | FS 751          | FS 755          |  |
| 46   | 47              | 48              |  |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |  |
|  |                 |                 |  |
| FS 641   | FS 651          | FS 655          |  |
| 41   | 42              | 43              |  |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |  |
|  |                 |                 |  |
| FS 453 + FS 425  | FS 457 + FS 425 | FS 458 + FS 425 |  |
| 51   | 52              | 53              |  |

| Säulentyp / Type of leader pin |        |   |    |
|--------------------------------|--------|---|----|
| eingepresst<br>press-fitted    |        | Schnellwechselsäule mit Bund<br>Leader pin, with collar |    |
|                                |        | L1  | L2 |
| FS 420                         | FS 419 | C1  | C1 |
| P                              | R      |   |    |

**Gestelltyp / Type of die set**

| Position der Haltestücke / Position of holding clamps |  |        |        |
|---|--|--------|--------|
|   |  | Pos. Z | Pos. X |

| Größe / Size | A<br>X<br>B     | Abmessungen / Dimensions         |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |                 |                 |             |                 |                 | Gewicht / Weight [kg] |              |              |              |  |
|--------------|-----------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-----------------|-----------------|-------------|-----------------|-----------------|-----------------------|--------------|--------------|--------------|--|
|              |                 | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 46<br>41    |             |             | 47<br>42        |                 |             | 48<br>43        |                 |                       | 51<br>X<br>B | 52<br>X<br>A | 53<br>X<br>A |  |
|              |                 | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B     | b<br>X<br>A     | c<br>X<br>A |                 |                 |                       |              |              |              |  |
| 601          |                 | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 7,8          |              |  |
| 602          | 125<br>X<br>125 | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 27<br>X<br>125  | 27<br>X<br>125  |             |                 |                 |                       |              | 8,4          |              |  |
| 603          |                 | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |             |                 |                 |                       |              | 9,7          |              |  |
| 604          |                 | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 9,5          |              |  |
| 605          | 160<br>X<br>125 | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 62<br>X<br>125  | 27<br>X<br>160  |             | 50<br>X<br>125  |                 |                       |              | 10,4         |              |  |
| 606          |                 | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |             |                 |                 |                       |              | 11,9         |              |  |
| 607          |                 | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 11,9         |              |  |
| 608          | 160<br>X<br>160 | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 62<br>X<br>160  | 62<br>X<br>160  |             | 50<br>X<br>160  | 50<br>X<br>160  |                       |              | 12,8         |              |  |
| 609          |                 | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |             |                 |                 |                       |              | 14,8         |              |  |
| 610          |                 | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 11,5         |              |  |
| 611          | 200<br>X<br>125 | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 102<br>X<br>125 | 27<br>X<br>200  |             | 90<br>X<br>125  |                 |                       |              | 12,5         |              |  |
| 612          |                 | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |             |                 |                 |                       |              | 14,5         |              |  |
| 613          |                 | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 14,3         |              |  |
| 614          | 200<br>X<br>160 | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 102<br>X<br>160 | 62<br>X<br>200  |             | 90<br>X<br>160  | 50<br>X<br>200  |                       |              | 15,6         |              |  |
| 615          |                 | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |             |                 |                 |                       |              | 18,1         |              |  |
| 616          |                 | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 17,5         |              |  |
| 617          | 200<br>X<br>200 | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 102<br>X<br>200 | 102<br>X<br>200 |             | 90<br>X<br>200  | 90<br>X<br>200  |                       |              | 19,1         |              |  |
| 618          |                 | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |             |                 |                 |                       |              | 22,3         |              |  |
| 619          |                 | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 14,0         |              |  |
| 620          | 250<br>X<br>125 | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 152<br>X<br>125 | 27<br>X<br>250  |             | 140<br>X<br>125 |                 |                       |              | 15,3         |              |  |
| 621          |                 | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |             |                 |                 |                       |              | 17,7         |              |  |
| 622          |                 | 28                               | 23 | -  |            | 130                                 | 100 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 17,5         |              |  |
| 623          | 250<br>X<br>160 | 28                               | 28 | -  | 18/19      | 140                                 | 110 | -                             |             |             |             | 152<br>X<br>160 | 60<br>X<br>250  |             | 140<br>X<br>160 | 50<br>X<br>250  |                       |              | 19,1         |              |  |
| 624          |                 | 38                               | 28 | -  |            | 150                                 | 110 | 100                           |             |             |             |                 |                 |             |                 |                 |                       |              | 22,3         |              |  |
| 625          |                 | 33                               | 28 | -  |            | 150                                 | 110 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 26,0         |              |  |
| 626          | 250<br>X<br>200 | 33                               | 33 | -  | 24/25      | 160                                 | 120 | -                             |             |             |             | 132<br>X<br>200 | 82<br>X<br>250  |             | 120<br>X<br>200 | 70<br>X<br>250  |                       |              | 27,9         |              |  |
| 627          |                 | 48                               | 38 | -  |            | 180                                 | 130 | 120                           |             |             |             |                 |                 |             |                 |                 |                       |              | 35,8         |              |  |
| 628          |                 | 33                               | 28 | -  |            | 150                                 | 110 | -                             |             |             |             |                 |                 |             |                 |                 |                       |              | 32,0         |              |  |
| 629          | 250<br>X<br>250 | 33                               | 33 | -  | 24/25      | 160                                 | 120 | -                             |             |             |             | 132<br>X<br>250 | 132<br>X<br>250 |             | 120<br>X<br>250 | 120<br>X<br>250 |                       |              | 34,4         |              |  |
| 630          |                 | 48                               | 38 | -  |            | 170                                 | 130 | 120                           |             |             |             |                 |                 |             |                 |                 |                       |              | 44,2         |              |  |



[03.12.2018]

| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Sinterbuchse<br>Leader pin bushing, sintered                           |                 |                 |
|  |                 |                 |
| FS 741   | FS 751          | FS 755          |
| 46   | 47              | 48              |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 641   | FS 651          | FS 655          |
| 41   | 42              | 43              |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 453 + FS 425  | FS 457 + FS 425 | FS 458 + FS 425 |
| 51   | 52              | 53              |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 420                         | FS 419  |
| P                              | R   |

| Gestelltyp / Type of die set |
|------------------------------|
|                              |
|                              |
|                              |

| Position der Haltestücke / Position of holding clamps |
|---|
|   |
| Pos. Z  |
|   |
| Pos. X  |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     | Arbeitsflächen / Working area |     |             |             |             |                 |                 |             |             | Gewicht / Weight [kg] |                 |                 |  |  |  |      |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-------------------------------|-----|-------------|-------------|-------------|-----------------|-----------------|-------------|-------------|-----------------------|-----------------|-----------------|--|--|--|------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |                               |     | 46<br>41    |             |             | 47<br>42        |                 |             | 48<br>43    |                       |                 | 51<br>52<br>53  |  |  |  |      |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2                            | L3  | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B     | b<br>X<br>A     | c<br>X<br>A | a<br>X<br>B |                       | b<br>X<br>A     | c<br>X<br>A     |  |  |  |      |
| 631          |                          | 33                               | 28 | -  |            | 150                                 | 110                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 25,0 |
| 632          | 300<br>X<br>160          | 33                               | 33 | -  | 24/25      | 160                                 | 120                           | -   |             |             |             | 182<br>X<br>160 | 42<br>X<br>300  |             |             |                       | 170<br>X<br>160 | 30<br>X<br>300  |  |  |  | 26,9 |
| 633          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 34,4 |
| 634          |                          | 33                               | 28 | -  |            | 150                                 | 110                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 30,8 |
| 635          | 300<br>X<br>200          | 33                               | 33 | -  | 24/25      | 160                                 | 120                           | -   |             |             |             | 182<br>X<br>200 | 82<br>X<br>300  |             |             |                       | 170<br>X<br>200 | 70<br>X<br>300  |  |  |  | 33,1 |
| 636          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 42,5 |
| 637          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 44,8 |
| 638          | 300<br>X<br>250          | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             | 158<br>X<br>250 | 108<br>X<br>300 |             |             |                       | 142<br>X<br>250 | 92<br>X<br>300  |  |  |  | 47,8 |
| 639          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 54,0 |
| 640          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 53,5 |
| 641          | 300<br>X<br>300          | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             | 158<br>X<br>300 | 158<br>X<br>300 |             |             |                       | 142<br>X<br>300 | 142<br>X<br>300 |  |  |  | 57,0 |
| 642          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 64,0 |
| 643          |                          | 33                               | 28 | -  |            | 150                                 | 110                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 35,6 |
| 644          | 350<br>X<br>200          | 33                               | 33 | -  | 24/25      | 160                                 | 120                           | -   |             |             |             | 232<br>X<br>200 | 82<br>X<br>350  |             |             |                       | 220<br>X<br>200 | 70<br>X<br>350  |  |  |  | 38,3 |
| 645          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 49,3 |
| 646          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 52,5 |
| 647          | 350<br>X<br>250          | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             | 208<br>X<br>250 | 108<br>X<br>350 |             |             |                       | 192<br>X<br>250 | 92<br>X<br>350  |  |  |  | 55,5 |
| 648          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 62,0 |
| 649          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 61,5 |
| 650          | 350<br>X<br>300          | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             | 208<br>X<br>300 | 158<br>X<br>350 |             |             |                       | 192<br>X<br>300 | 142<br>X<br>350 |  |  |  | 66,0 |
| 651          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 74,0 |
| 652          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 71,5 |
| 653          | 350<br>X<br>350          | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             | 208<br>X<br>350 | 208<br>X<br>350 |             |             |                       | 192<br>X<br>350 | 192<br>X<br>350 |  |  |  | 76,5 |
| 654          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 86,0 |
| 655          |                          | 33                               | 28 | -  |            | 150                                 | 110                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 40,4 |
| 656          | 400<br>X<br>200          | 33                               | 33 | -  | 24/25      | 160                                 | 120                           | -   |             |             |             | 282<br>X<br>200 | 82<br>X<br>400  |             |             |                       | 270<br>X<br>200 | 70<br>X<br>400  |  |  |  | 43,5 |
| 657          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 56,0 |
| 658          |                          | 38                               | 33 | -  |            | 160                                 | 120                           | -   |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 59,0 |
| 659          | 400<br>X<br>250          | 38                               | 38 | -  | 30/32      | 170                                 | 130                           | -   |             |             |             | 258<br>X<br>250 | 108<br>X<br>400 |             |             |                       | 242<br>X<br>250 | 92<br>X<br>400  |  |  |  | 63,0 |
| 660          |                          | 48                               | 38 | -  |            | 180                                 | 130                           | 120 |             |             |             |                 |                 |             |             |                       |                 |                 |  |  |  | 70,5 |



# Säulengestelle aus Stahl, 2 Platten, 4 Säulen, Typ Q



[SG]

## Steel die sets, 2 plates, 4 posts, type Q

SÄULENGESTELLE / DIE SETS

| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Sinterbuchse<br>Leader pin bushing, sintered                           |                 |                 |
|  |                 |                 |
| FS 741   | FS 751          | FS 755          |
| 46   | 47              | 48              |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 641   | FS 651          | FS 655          |
| 41   | 42              | 43              |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 453 + FS 425  | FS 457 + FS 425 | FS 458 + FS 425 |
| 51   | 52              | 53              |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 420                         | FS 419  |
| P                              | R   |

| Gestelltyp / Type of die set |
|------------------------------|
|                              |
|                              |

| Position der Haltestücke / Position of holding clamps |
|---|
|   |
|   |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |             |             |             |          |  | Gewicht / Weight [kg] |              |              |              |  |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|--|-----------------------|--------------|--------------|--------------|--|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 46<br>41    |             |             | 47<br>42    |             |             | 48<br>43 |  |                       | 51<br>X<br>B | 52<br>X<br>A | 53<br>X<br>A |  |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |          |  |                       |              |              |              |  |
| 661          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 87,0         |  |
| 662          | 400                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 96,5         |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 238         | 138         |          |  |                       |              |              |              |  |
| 300          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 300         | 400         |          |  |                       |              |              | 106,0        |  |
| 663          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 101,0        |  |
| 664          | 400                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 112,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 238         | 188         |          |  |                       |              |              |              |  |
| 350          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 350         | 400         |          |  |                       |              |              | 123,0        |  |
| 665          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 114,0        |  |
| 666          | 400                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 127,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 238         | 238         |          |  |                       |              |              |              |  |
| 350          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 400         | 400         |          |  |                       |              |              | 140,0        |  |
| 667          |                          |                                  | 38 | 33 | -          |                                     | 160 | 120                           | -           |             |             |             |             |             |          |  |                       |              |              | 73,0         |  |
| 668          | 400                      |                                  | 38 | 38 | -          |                                     | 170 | 130                           | -           |             |             |             |             |             |          |  |                       |              |              | 78,0         |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 250         | 500         |          |  |                       |              |              |              |  |
| 400          |                          |                                  | 48 | 38 | -          |                                     | 180 | 130                           | 120         |             |             |             | 250         | 500         |          |  |                       |              |              | 87,5         |  |
| 669          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 108,0        |  |
| 670          | 500                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 119,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 338         | 138         |          |  |                       |              |              |              |  |
| 250          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 300         | 500         |          |  |                       |              |              | 131,0        |  |
| 671          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 125,0        |  |
| 672          | 500                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 138,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 338         | 188         |          |  |                       |              |              |              |  |
| 250          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 350         | 500         |          |  |                       |              |              | 152,0        |  |
| 673          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 141,0        |  |
| 674          | 500                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 157,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 338         | 238         |          |  |                       |              |              |              |  |
| 300          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 400         | 500         |          |  |                       |              |              | 173,0        |  |
| 675          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 175,0        |  |
| 676          | 500                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 195,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 338         | 338         |          |  |                       |              |              |              |  |
| 350          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 350         | 500         |          |  |                       |              |              | 214,0        |  |
| 677          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 128,0        |  |
| 678          | 500                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 142,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 438         | 138         |          |  |                       |              |              |              |  |
| 400          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 300         | 600         |          |  |                       |              |              | 156,0        |  |
| 679          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 148,0        |  |
| 680          | 500                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 165,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 438         | 188         |          |  |                       |              |              |              |  |
| 300          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 350         | 600         |          |  |                       |              |              | 181,0        |  |
| 681          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 128,0        |  |
| 682          | 600                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 148,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 438         | 188         |          |  |                       |              |              |              |  |
| 300          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 300         | 600         |          |  |                       |              |              | 165,0        |  |
| 683          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 128,0        |  |
| 684          | 600                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 148,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 438         | 188         |          |  |                       |              |              |              |  |
| 350          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 350         | 600         |          |  |                       |              |              | 165,0        |  |
| 685          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 128,0        |  |
| 686          | 600                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 148,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 438         | 188         |          |  |                       |              |              |              |  |
| 300          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 300         | 600         |          |  |                       |              |              | 165,0        |  |
| 687          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 128,0        |  |
| 688          | 600                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 148,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 438         | 188         |          |  |                       |              |              |              |  |
| 350          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 350         | 600         |          |  |                       |              |              | 165,0        |  |
| 689          |                          |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 128,0        |  |
| 690          | 600                      |                                  | 48 | 38 | -          |                                     | 190 | 140                           | -           |             |             |             |             |             |          |  |                       |              |              | 148,0        |  |
|              | X                        |                                  | 48 | 48 | -          | 40/42                               | 200 | 150                           | -           |             |             |             | 438         | 188         |          |  |                       |              |              |              |  |
| 350          |                          |                                  | 58 | 48 | -          |                                     | 210 | 150                           | 140         |             |             |             | 350         | 600         |          |  |                       |              |              | 165,0        |  |

# Säulengestelle aus Stahl, 2 Platten, 4 Säulen, Typ Q

## Steel die sets, 2 plates, 4 posts, type Q



### SÄULENGESTELLE / DIE SETS

| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Sinterbuchse<br>Leader pin bushing, sintered                           |                 |                 |
|  |                 |                 |
| FS 741   | FS 751          | FS 755          |
| 46   | 47              | 48              |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 641   | FS 651          | FS 655          |
| 41   | 42              | 43              |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 453 + FS 425  | FS 457 + FS 425 | FS 458 + FS 425 |
| 51   | 52              | 53              |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 420                         | FS 419  |
| P                              | R   |

| Gestelltyp / Type of die set |
|------------------------------|
|                              |
|                              |

| Position der Haltestücke / Position of holding clamps |
|---|
|   |
|   |
| Pos. Z  |
| Pos. X  |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |     |             | Arbeitsflächen / Working area |             |                 |                 |             |             |             |                 |                 | Gewicht / Weight [kg] |  |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-----|-------------|-------------------------------|-------------|-----------------|-----------------|-------------|-------------|-------------|-----------------|-----------------|-----------------------|--|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |     | 46<br>41    |                               |             | 47<br>42        |                 |             | 48<br>43    |             |                 | 51<br>52<br>53  |                       |  |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3  | a<br>X<br>B | b<br>X<br>A                   | c<br>X<br>A | a<br>X<br>B     | b<br>X<br>A     | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A     |                 |                       |  |       |
| 691          |                          | 48                               | 38 | -  |            | 190                                 | 140 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 168,0 |
| 692          | 600<br>X<br>400          | 48                               | 48 | -  | 40/42      | 200                                 | 150 | -   |             |                               |             | 438<br>X<br>400 | 238<br>X<br>600 |             |             |             | 422<br>X<br>400 | 222<br>X<br>600 |                       |  | 187,0 |
| 693          |                          | 58                               | 48 | -  |            | 210                                 | 150 | 140 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 206,0 |
| 694          |                          | 58                               | 48 | -  |            | 220                                 | 160 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 259,0 |
| 695          | 600<br>X<br>500          | 58                               | 58 | -  | 50/52      | 230                                 | 170 | -   |             |                               |             | 406<br>X<br>500 | 306<br>X<br>600 |             |             |             | 390<br>X<br>500 | 290<br>X<br>600 |                       |  | 283,0 |
| 696          |                          | 68                               | 58 | -  |            | 240                                 | 170 | 160 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 306,0 |
| 697          |                          | 58                               | 48 | -  |            | 220                                 | 160 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 309,0 |
| 698          | 600<br>X<br>600          | 58                               | 58 | -  | 50/52      | 230                                 | 170 | -   |             |                               |             | 406<br>X<br>600 | 406<br>X<br>600 |             |             |             | 390<br>X<br>600 | 390<br>X<br>600 |                       |  | 337,0 |
| 699          |                          | 68                               | 58 | -  |            | 240                                 | 170 | 160 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 365,0 |
| 700          |                          | 48                               | 38 | -  |            | 190                                 | 140 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 172,0 |
| 701          | 700<br>X<br>350          | 48                               | 48 | -  | 40/42      | 200                                 | 150 | -   |             |                               |             | 538<br>X<br>350 | 188<br>X<br>700 |             |             |             | 522<br>X<br>350 | 172<br>X<br>700 |                       |  | 191,0 |
| 702          |                          | 58                               | 48 | -  |            | 210                                 | 150 | 140 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 210,0 |
| 703          |                          | 58                               | 48 | -  |            | 220                                 | 160 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 242,0 |
| 704          | 700<br>X<br>400          | 58                               | 58 | -  | 50/52      | 230                                 | 170 | -   |             |                               |             | 506<br>X<br>400 | 206<br>X<br>700 |             |             |             | 490<br>X<br>400 | 190<br>X<br>700 |                       |  | 264,0 |
| 705          |                          | 68                               | 58 | -  |            | 240                                 | 170 | 160 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 286,0 |
| 706          |                          | 58                               | 48 | -  |            | 220                                 | 160 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 300,0 |
| 707          | 700<br>X<br>500          | 58                               | 58 | -  | 50/52      | 230                                 | 170 | -   |             |                               |             | 506<br>X<br>500 | 306<br>X<br>700 |             |             |             | 490<br>X<br>500 | 290<br>X<br>700 |                       |  | 328,0 |
| 708          |                          | 68                               | 58 | -  |            | 240                                 | 170 | 160 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 356,0 |
| 709          |                          | 58                               | 48 | -  |            | 220                                 | 160 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 359,0 |
| 710          | 700<br>X<br>600          | 58                               | 58 | -  | 50/52      | 230                                 | 170 | -   |             |                               |             | 506<br>X<br>600 | 406<br>X<br>700 |             |             |             | 490<br>X<br>600 | 390<br>X<br>700 |                       |  | 392,0 |
| 711          |                          | 68                               | 58 | -  |            | 240                                 | 170 | 160 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 425,0 |
| 712          |                          | 58                               | 48 | -  |            | 220                                 | 160 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 276,0 |
| 713          | 800<br>X<br>400          | 58                               | 58 | -  | 50/52      | 230                                 | 170 | -   |             |                               |             | 606<br>X<br>400 | 206<br>X<br>800 |             |             |             | 590<br>X<br>400 | 190<br>X<br>800 |                       |  | 301,0 |
| 714          |                          | 68                               | 58 | -  |            | 240                                 | 170 | 160 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 326,0 |
| 715          |                          | 58                               | 48 | -  |            | 220                                 | 160 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 342,0 |
| 716          | 800<br>X<br>500          | 58                               | 58 | -  | 50/52      | 230                                 | 170 | -   |             |                               |             | 606<br>X<br>500 | 306<br>X<br>800 |             |             |             | 590<br>X<br>500 | 290<br>X<br>800 |                       |  | 374,0 |
| 717          |                          | 68                               | 58 | -  |            | 240                                 | 170 | 160 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 405,0 |
| 718          |                          | 58                               | 48 | -  |            | 220                                 | 160 | -   |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 409,0 |
| 719          | 800<br>X<br>600          | 58                               | 58 | -  | 50/52      | 230                                 | 170 | -   |             |                               |             | 606<br>X<br>600 | 406<br>X<br>800 |             |             |             | 590<br>X<br>600 | 390<br>X<br>800 |                       |  | 447,0 |
| 720          |                          | 68                               | 58 | -  |            | 240                                 | 170 | 160 |             |                               |             |                 |                 |             |             |             |                 |                 |                       |  | 484,0 |

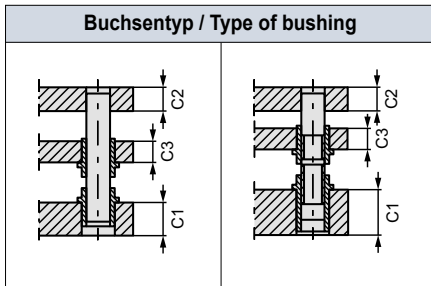
# Säulengestelle aus Stahl, 3 Platten, 4 Säulen, Typ Q



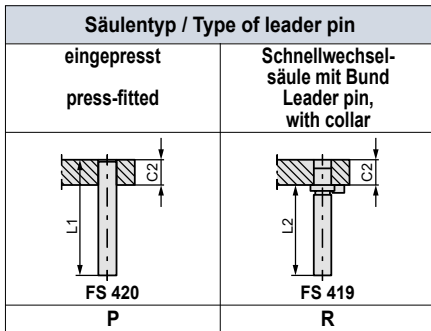
[SG]

## Steel die sets, 3 plates, 4 posts, type Q

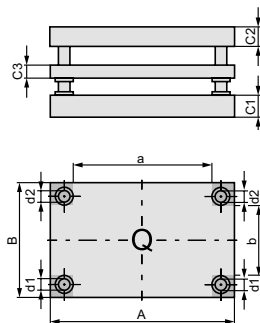
SÄULENGESTELLE / DIE SETS



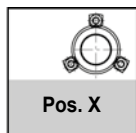
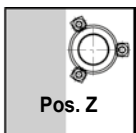
| Sinterbuchse<br>Leader pin bushing, sintered                           |  |
|--|--|
| C1: FS 741<br>C3: FS 731<br>88   | C1: FS 732<br>C3: FS 731<br>87                   |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |  |
| C1: FS 641<br>C3: FS 631<br>71   | C1: FS 632<br>C3: FS 631<br>72                   |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |  |
| C1: FS 458 + FS 425<br>C3: FS 457 + FS 425<br>91                       | C1: FS 453 + FS 425<br>C3: FS 457 + FS 425<br>92 |



### Gestelltyp / Type of die set

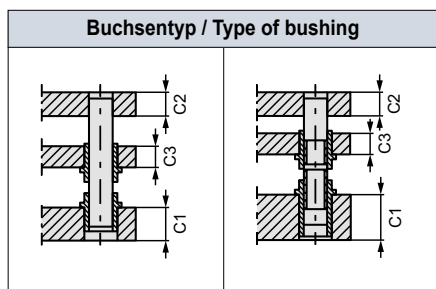


### Position der Haltestücke / Position of holding clamps

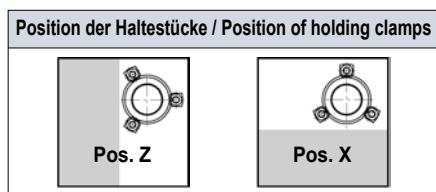
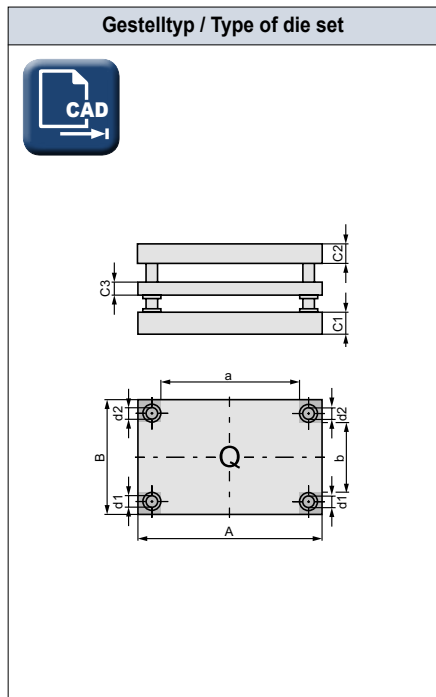
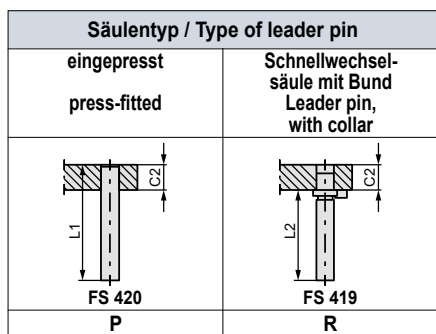


| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |                 |                 |             | Gewicht / Weight [kg] |                 |      |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-----------------|-----------------|-------------|-----------------------|-----------------|------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 88<br>71 72 |             |                 | 91 92           |             |                       |                 |      |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A     | a<br>X<br>B     | b<br>X<br>A |                       | c<br>X<br>A     |      |
| 601          |                          | 28                               | 23 |    |            | 140                                 | 120 | -                             |             |             |                 |                 |             |                       |                 | 10,0 |
| 602          | 125<br>X<br>125          | 38                               | 28 | 18 | 18/19      | 160                                 | 130 | -                             |             |             | 27<br>X<br>125  | 27<br>X<br>125  |             |                       |                 | 11,8 |
| 603          |                          | 38                               | 38 |    |            | 170                                 | 130 | 120                           |             |             |                 |                 |             |                       |                 | 13,1 |
| 604          |                          | 28                               | 23 |    |            | 140                                 | 120 | -                             |             |             |                 |                 |             |                       |                 | 12,4 |
| 605          | 160<br>X<br>125          | 38                               | 28 | 18 | 18/19      | 160                                 | 130 | -                             |             |             | 62<br>X<br>125  | 27<br>X<br>160  |             |                       |                 | 14,2 |
| 606          |                          | 38                               | 38 |    |            | 170                                 | 130 | 120                           |             |             |                 |                 |             |                       |                 | 16,3 |
| 607          |                          | 28                               | 23 |    |            | 140                                 | 120 | -                             |             |             |                 |                 |             |                       |                 | 15,4 |
| 608          | 160<br>X<br>160          | 38                               | 28 | 18 | 18/19      | 160                                 | 130 | -                             |             |             | 62<br>X<br>160  | 62<br>X<br>160  |             | 50<br>X<br>160        | 50<br>X<br>160  | 18,4 |
| 609          |                          | 38                               | 38 |    |            | 170                                 | 130 | 120                           |             |             |                 |                 |             |                       |                 | 20,4 |
| 610          |                          | 28                               | 23 |    |            | 140                                 | 120 | -                             |             |             |                 |                 |             |                       |                 | 15,1 |
| 611          | 200<br>X<br>125          | 38                               | 28 | 18 | 18/19      | 160                                 | 130 | -                             |             |             | 102<br>X<br>125 | 27<br>X<br>200  |             | 90<br>X<br>125        |                 | 18,0 |
| 612          |                          | 38                               | 38 |    |            | 170                                 | 130 | 120                           |             |             |                 |                 |             |                       |                 | 20,0 |
| 613          |                          | 28                               | 23 |    |            | 140                                 | 120 | -                             |             |             |                 |                 |             |                       |                 | 18,9 |
| 614          | 200<br>X<br>160          | 38                               | 28 | 18 | 18/19      | 160                                 | 130 | -                             |             |             | 102<br>X<br>160 | 62<br>X<br>200  |             | 90<br>X<br>160        | 50<br>X<br>200  | 22,6 |
| 615          |                          | 38                               | 38 |    |            | 170                                 | 130 | 120                           |             |             |                 |                 |             |                       |                 | 25,2 |
| 616          |                          | 28                               | 23 |    |            | 140                                 | 120 | -                             |             |             |                 |                 |             |                       |                 | 23,2 |
| 617          | 200<br>X<br>200          | 38                               | 28 | 18 | 18/19      | 160                                 | 130 | -                             |             |             | 102<br>X<br>200 | 102<br>X<br>200 |             | 90<br>X<br>200        | 90<br>X<br>200  | 27,9 |
| 618          |                          | 38                               | 38 |    |            | 170                                 | 130 | 120                           |             |             |                 |                 |             |                       |                 | 31,1 |
| 619          |                          | 28                               | 23 |    |            | 140                                 | 120 | -                             |             |             |                 |                 |             |                       |                 | 18,5 |
| 620          | 250<br>X<br>125          | 38                               | 28 | 18 | 18/19      | 160                                 | 130 | -                             |             |             | 152<br>X<br>125 | 27<br>X<br>250  |             | 140<br>X<br>125       |                 | 22,1 |
| 621          |                          | 38                               | 38 |    |            | 170                                 | 130 | 120                           |             |             |                 |                 |             |                       |                 | 24,6 |
| 622          |                          | 28                               | 23 |    |            | 140                                 | 120 | -                             |             |             |                 |                 |             |                       |                 | 23,2 |
| 623          | 250<br>X<br>160          | 38                               | 28 | 18 | 18/19      | 160                                 | 130 | -                             |             |             | 152<br>X<br>160 | 60<br>X<br>250  |             | 140<br>X<br>160       | 50<br>X<br>250  | 27,9 |
| 624          |                          | 38                               | 38 |    |            | 170                                 | 130 | 120                           |             |             |                 |                 |             |                       |                 | 31,1 |
| 625          |                          | 33                               | 28 |    |            | 160                                 | 130 | -                             |             |             |                 |                 |             |                       |                 | 35,0 |
| 626          | 250<br>X<br>200          | 48                               | 38 | 23 | 24/25      | 190                                 | 150 | -                             |             |             | 132<br>X<br>200 | 82<br>X<br>250  |             | 120<br>X<br>200       | 70<br>X<br>250  | 44,8 |
| 627          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                       |                 | 48,7 |
| 628          |                          | 33                               | 28 |    |            | 160                                 | 130 | -                             |             |             |                 |                 |             |                       |                 | 43,2 |
| 629          | 250<br>X<br>250          | 48                               | 38 | 23 | 24/25      | 190                                 | 150 | -                             |             |             | 132<br>X<br>250 | 132<br>X<br>250 |             | 120<br>X<br>250       | 120<br>X<br>250 | 55,5 |
| 630          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                       |                 | 60,5 |

[SG]



|  |                     |
|--|---------------------|
| <b>Sinterbuchse<br/>Leader pin bushing, sintered</b>                           |                     |
| C1: FS 741   | C1: FS 732          |
| C3: FS 731   | C3: FS 731          |
| 88   | 87                  |
| <b>Stahlbuchse mit Bronzeplattierung<br/>Leader pin bushing, bronze plated</b> |                     |
| C1: FS 641   | C1: FS 632          |
| C3: FS 631   | C3: FS 631          |
| 71   | 72                  |
| <b>Stahlbuchse mit Ms-Käfig<br/>Leader pin bushing with ball cage</b>          |                     |
| C1: FS 458 + FS 425  | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425  | C3: FS 457 + FS 425 |
| 91   | 92                  |



| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |                 |                 |             |                 |                 | Gewicht / Weight [kg] |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-----------------|-----------------|-------------|-----------------|-----------------|-----------------------|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 88<br>71 72 |             |                 | 91 92           |             |                 |                 |                       |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A     | a<br>X<br>B     | b<br>X<br>A | c<br>X<br>A     |                 |                       |       |
| 631          |                          | 33                               | 28 |    |            | 160                                 | 130 | -                             |             |             |                 |                 |             |                 |                 |                       | 33,7  |
| 632          | 300<br>X<br>160          | 48                               | 38 | 23 | 24/25      | 190                                 | 150 | -                             |             |             | 182<br>X<br>160 | 42<br>X<br>300  |             | 170<br>X<br>160 | 30<br>X<br>300  |                       | 43,1  |
| 633          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                 |                 |                       | 46,9  |
| 634          |                          | 33                               | 28 |    |            | 160                                 | 130 | -                             |             |             |                 |                 |             |                 |                 |                       | 41,6  |
| 635          | 300<br>X<br>200          | 48                               | 38 | 23 | 24/25      | 190                                 | 150 | -                             |             |             | 182<br>X<br>200 | 82<br>X<br>300  |             | 170<br>X<br>200 | 70<br>X<br>300  |                       | 53,5  |
| 636          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                 |                 |                       | 58,5  |
| 637          |                          | 38                               | 33 |    |            | 170                                 | 140 | -                             |             |             |                 |                 |             |                 |                 |                       | 61,5  |
| 638          | 300<br>X<br>250          | 48                               | 38 | 28 | 30/32      | 190                                 | 150 | -                             |             |             | 158<br>X<br>250 | 108<br>X<br>300 |             | 142<br>X<br>250 | 92<br>X<br>300  |                       | 70,5  |
| 639          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                 |                 |                       | 76,0  |
| 640          |                          | 38                               | 33 |    |            | 170                                 | 140 | -                             |             |             |                 |                 |             |                 |                 |                       | 73,0  |
| 641          | 300<br>X<br>300          | 48                               | 38 | 28 | 30/32      | 190                                 | 150 | -                             |             |             | 158<br>X<br>300 | 158<br>X<br>300 |             | 142<br>X<br>300 | 142<br>X<br>300 |                       | 83,5  |
| 642          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                 |                 |                       | 90,5  |
| 643          |                          | 33                               | 28 |    |            | 160                                 | 130 | -                             |             |             |                 |                 |             |                 |                 |                       | 48,2  |
| 644          | 350<br>X<br>200          | 48                               | 38 | 23 | 24/25      | 190                                 | 150 | -                             |             |             | 232<br>X<br>200 | 82<br>X<br>350  |             | 220<br>X<br>200 | 70<br>X<br>350  |                       | 62,0  |
| 645          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                 |                 |                       | 67,5  |
| 646          |                          | 38                               | 33 |    |            | 170                                 | 140 | -                             |             |             |                 |                 |             |                 |                 |                       | 71,0  |
| 647          | 350<br>X<br>250          | 48                               | 38 | 28 | 30/32      | 190                                 | 150 | -                             |             |             | 208<br>X<br>250 | 108<br>X<br>350 |             | 192<br>X<br>250 | 92<br>X<br>350  |                       | 81,5  |
| 648          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                 |                 |                       | 88,5  |
| 649          |                          | 38                               | 33 |    |            | 170                                 | 140 | -                             |             |             |                 |                 |             |                 |                 |                       | 85,0  |
| 650          | 350<br>X<br>300          | 48                               | 38 | 28 | 30/32      | 190                                 | 150 | -                             |             |             | 208<br>X<br>300 | 158<br>X<br>350 |             | 192<br>X<br>300 | 142<br>X<br>350 |                       | 97,0  |
| 651          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                 |                 |                       | 105,0 |
| 652          |                          | 38                               | 33 |    |            | 170                                 | 140 | -                             |             |             |                 |                 |             |                 |                 |                       | 98,5  |
| 653          | 350<br>X<br>350          | 48                               | 38 | 28 | 30/32      | 190                                 | 150 | -                             |             |             | 208<br>X<br>350 | 208<br>X<br>350 |             | 192<br>X<br>350 | 192<br>X<br>350 |                       | 113,0 |
| 654          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                 |                 |                       | 123,0 |
| 655          |                          | 33                               | 28 |    |            | 160                                 | 130 | -                             |             |             |                 |                 |             |                 |                 |                       | 55,0  |
| 656          | 400<br>X<br>200          | 48                               | 38 | 23 | 24/25      | 190                                 | 150 | -                             |             |             | 282<br>X<br>200 | 82<br>X<br>400  |             | 270<br>X<br>200 | 70<br>X<br>400  |                       | 70,5  |
| 657          |                          | 48                               | 48 |    |            | 200                                 | 150 | 130                           |             |             |                 |                 |             |                 |                 |                       | 77,0  |
| 658          |                          | 38                               | 33 |    |            | 170                                 | 140 | -                             |             |             |                 |                 |             |                 |                 |                       | 81,0  |
| 659          | 400<br>X<br>250          | 48                               | 38 | 28 | 30/32      | 190                                 | 150 | -                             |             |             | 258<br>X<br>250 | 108<br>X<br>400 |             | 242<br>X<br>250 | 92<br>X<br>400  |                       | 92,5  |
| 660          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |                 |                 |             |                 |                 |                       | 101,0 |

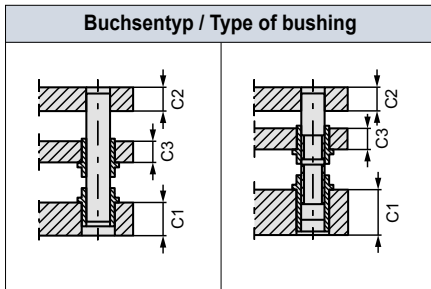
# Säulengestelle aus Stahl, 3 Platten, 4 Säulen, Typ Q

## Steel die sets, 3 plates, 4 posts, type Q

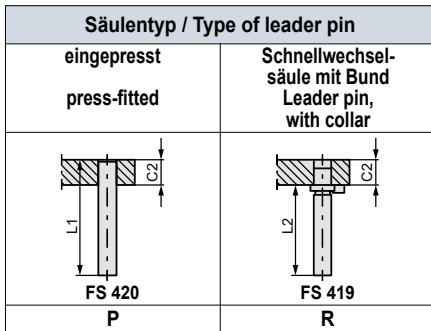


[SG]

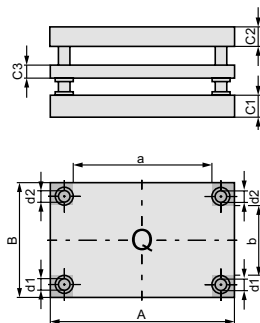
### SÄULENGESTELLE / DIE SETS



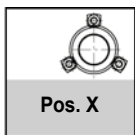
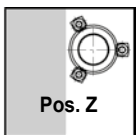
| Sinterbuchse<br>Leader pin bushing, sintered                           |  |
|--|--|
| C1: FS 741<br>C3: FS 731<br>88   | C1: FS 732<br>C3: FS 731<br>87                   |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |  |
| C1: FS 641<br>C3: FS 631<br>71   | C1: FS 632<br>C3: FS 631<br>72                   |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |  |
| C1: FS 458 + FS 425<br>C3: FS 457 + FS 425<br>91                       | C1: FS 453 + FS 425<br>C3: FS 457 + FS 425<br>92 |



### Gestelltyp / Type of die set



### Position der Haltestücke / Position of holding clamps



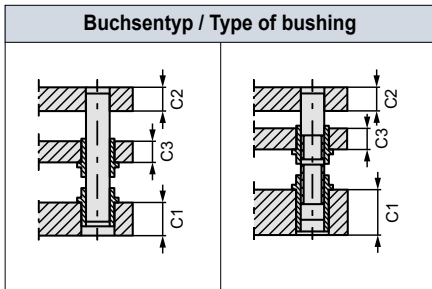
| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |             |             |             |     |     | Gewicht / Weight [kg] |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|-----|-----------------------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 88<br>71 72 |             |             | 91 92       |             |             |     |     |                       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |     |     |                       |
| 661          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |             |     |     | 118,0                 |
| 662          | 400                      | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 238         | 138         |             | 222 | 122 | 137,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 300                      |                                  |    |    |            |                                     |     |                               |             |             |             | 300         | 400         |             | 300 | 400 | 147,0                 |
| 663          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |             |             |             |     |     |                       |
| 664          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |             |     |     | 137,0                 |
| 665          | 400                      | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 238         | 188         |             | 222 | 172 | 159,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 350                      |                                  |    |    |            |                                     |     |                               |             |             |             | 350         | 400         |             | 350 | 400 | 170,0                 |
| 666          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |             |             |             |     |     |                       |
| 667          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |             |     |     | 156,0                 |
| 668          | 400                      | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 238         | 238         |             | 222 | 222 | 181,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             | 400         | 400         |             | 400 | 400 | 194,0                 |
| 669          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |             |             |             |     |     |                       |
| 670          |                          | 38                               | 33 |    |            | 170                                 | 140 | -                             |             |             |             |             |             |             |     |     | 100,0                 |
| 671          | 500                      | 48                               | 38 | 28 | 30/32      | 190                                 | 150 | -                             |             |             |             | 358         | 108         |             | 342 | 92  | 115,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 250                      |                                  |    |    |            |                                     |     |                               |             |             |             | 250         | 500         |             | 250 | 500 | 125,0                 |
| 672          |                          | 48                               | 48 |    |            | 200                                 | 150 | 140                           |             |             |             |             |             |             |     |     |                       |
| 673          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |             |     |     | 146,0                 |
| 674          | 500                      | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 338         | 138         |             | 322 | 122 | 170,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 300                      |                                  |    |    |            |                                     |     |                               |             |             |             | 300         | 500         |             | 300 | 500 | 182,0                 |
| 675          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |             |             |             |     |     |                       |
| 676          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |             |     |     | 170,0                 |
| 677          | 500                      | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 338         | 188         |             | 322 | 172 | 197,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 350                      |                                  |    |    |            |                                     |     |                               |             |             |             | 350         | 500         |             | 350 | 500 | 211,0                 |
| 678          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |             |             |             |     |     |                       |
| 679          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |             |     |     | 193,0                 |
| 680          | 500                      | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 338         | 238         |             | 322 | 222 | 225,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             | 400         | 500         |             | 400 | 500 | 240,0                 |
| 681          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |             |             |             |     |     |                       |
| 682          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |             |     |     | 240,0                 |
| 683          | 500                      | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 338         | 338         |             | 322 | 322 | 279,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             | 500         | 500         |             | 500 | 500 | 299,0                 |
| 684          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |             |             |             |     |     |                       |
| 685          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |             |     |     | 174,0                 |
| 686          | 600                      | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 438         | 138         |             | 422 | 122 | 203,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 300                      |                                  |    |    |            |                                     |     |                               |             |             |             | 300         | 600         |             | 300 | 600 | 217,0                 |
| 687          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |             |             |             |     |     |                       |
| 688          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |             |     |     | 202,0                 |
| 689          | 600                      | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -                             |             |             |             | 438         | 188         |             | 422 | 172 | 235,0                 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |             | X   | X   |                       |
|              | 350                      |                                  |    |    |            |                                     |     |                               |             |             |             | 350         | 600         |             | 350 | 600 | 252,0                 |
| 690          |                          | 58                               | 58 |    |            | 230                                 | 170 | 160                           |             |             |             |             |             |             |     |     |                       |

# Säulengestelle aus Stahl, 3 Platten, 4 Säulen, Typ Q

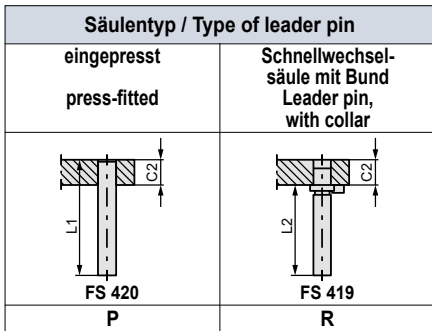
## Steel die sets, 3 plates, 4 posts, type Q



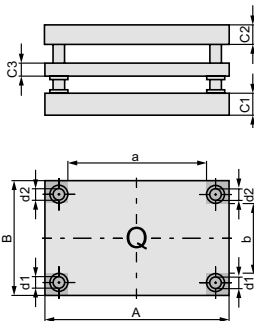
### SÄULENGESTELLE / DIE SETS



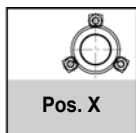
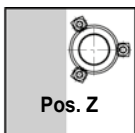
|   |                     |
|---|---------------------|
| <b>Sinterbuche<br/>Leader pin bushing, sintered</b>                           |                     |
| C1: FS 741  | C1: FS 732          |
| C3: FS 731  | C3: FS 731          |
| 88  | 87                  |
| <b>Stahlbuche mit Bronzeplattierung<br/>Leader pin bushing, bronze plated</b> |                     |
| C1: FS 641  | C1: FS 632          |
| C3: FS 631  | C3: FS 631          |
| 71  | 72                  |
| <b>Stahlbuche mit Ms-Käfig<br/>Leader pin bushing with ball cage</b>          |                     |
| C1: FS 458 + FS 425   | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425   | C3: FS 457 + FS 425 |
| 91  | 92                  |



**Gestelltyp / Type of die set**



**Position der Haltestücke / Position of holding clamps**

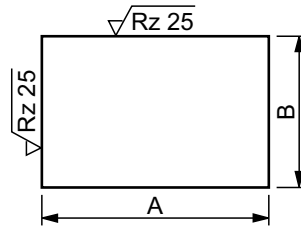


| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |     | Arbeitsflächen / Working area |             |             |             |             |             |     |     | Gewicht / Weight [kg] |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-----|-----|-----------------------|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |     | 88<br>71 72                   |             |             | 91 92       |             |             |     |     |                       |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3  | a<br>X<br>B                   | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |     |     |                       |       |
| 691          |                          | 48                               | 38 |    |            | 200                                 | 160 | -   |                               |             |             |             |             |             |     |     | 230,0                 |       |
| 692          | 600                      |                                  |    |    |            |                                     |     |     |                               |             |             | 438         | 238         |             | 422 | 222 |                       | 268,0 |
|              | X                        | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 693          | 400                      |                                  |    |    |            |                                     |     |     |                               |             |             | 400         | 600         |             | 400 | 600 |                       | 287,0 |
|              | X                        | 58                               | 58 |    |            | 230                                 | 170 | 160 |                               |             |             |             |             |             |     |     |                       |       |
| 694          |                          | 58                               | 48 |    |            | 230                                 | 180 | -   |                               |             |             |             |             |             |     |     | 348,0                 |       |
| 695          | 600                      |                                  |    |    |            |                                     |     |     |                               |             |             | 406         | 306         |             | 390 | 290 |                       | 395,0 |
|              | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 696          | 500                      |                                  |    |    |            |                                     |     |     |                               |             |             | 500         | 600         |             | 500 | 600 |                       | 419,0 |
|              | X                        | 68                               | 68 |    |            | 260                                 | 200 | 180 |                               |             |             |             |             |             |     |     |                       |       |
| 697          |                          | 58                               | 48 |    |            | 230                                 | 180 | -   |                               |             |             |             |             |             |     |     | 416,0                 |       |
| 698          | 600                      |                                  |    |    |            |                                     |     |     |                               |             |             | 406         | 406         |             | 390 | 390 |                       | 473,0 |
|              | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 699          | 600                      |                                  |    |    |            |                                     |     |     |                               |             |             | 600         | 600         |             | 600 | 600 |                       | 501,0 |
|              | X                        | 68                               | 68 |    |            | 260                                 | 200 | 180 |                               |             |             |             |             |             |     |     |                       |       |
| 700          |                          | 48                               | 38 |    |            | 200                                 | 160 | -   |                               |             |             |             |             |             |     |     | 235,0                 |       |
| 701          | 700                      |                                  |    |    |            |                                     |     |     |                               |             |             | 538         | 188         |             | 522 | 172 |                       | 274,0 |
|              | X                        | 58                               | 48 | 33 | 40/42      | 220                                 | 170 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 702          | 350                      |                                  |    |    |            |                                     |     |     |                               |             |             | 350         | 700         |             | 350 | 700 |                       | 293,0 |
|              | X                        | 58                               | 58 |    |            | 230                                 | 170 | 160 |                               |             |             |             |             |             |     |     |                       |       |
| 703          |                          | 58                               | 48 |    |            | 230                                 | 180 | -   |                               |             |             |             |             |             |     |     | 326,0                 |       |
| 704          | 700                      |                                  |    |    |            |                                     |     |     |                               |             |             | 506         | 206         |             | 490 | 190 |                       | 370,0 |
|              | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 705          | 400                      |                                  |    |    |            |                                     |     |     |                               |             |             | 400         | 700         |             | 400 | 700 |                       | 392,0 |
|              | X                        | 68                               | 68 |    |            | 260                                 | 200 | 180 |                               |             |             |             |             |             |     |     |                       |       |
| 706          |                          | 58                               | 48 |    |            | 230                                 | 180 | -   |                               |             |             |             |             |             |     |     | 405,0                 |       |
| 707          | 700                      |                                  |    |    |            |                                     |     |     |                               |             |             | 506         | 306         |             | 490 | 290 |                       | 460,0 |
|              | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 708          | 500                      |                                  |    |    |            |                                     |     |     |                               |             |             | 500         | 700         |             | 500 | 700 |                       | 487,0 |
|              | X                        | 68                               | 68 |    |            | 260                                 | 200 | 180 |                               |             |             |             |             |             |     |     |                       |       |
| 709          |                          | 58                               | 48 |    |            | 230                                 | 180 | -   |                               |             |             |             |             |             |     |     | 484,0                 |       |
| 710          | 700                      |                                  |    |    |            |                                     |     |     |                               |             |             | 506         | 406         |             | 490 | 390 |                       | 540,0 |
|              | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 711          | 600                      |                                  |    |    |            |                                     |     |     |                               |             |             | 600         | 700         |             | 600 | 700 |                       | 583,0 |
|              | X                        | 68                               | 68 |    |            | 260                                 | 200 | 180 |                               |             |             |             |             |             |     |     |                       |       |
| 712          |                          | 58                               | 48 |    |            | 230                                 | 180 | -   |                               |             |             |             |             |             |     |     | 371,0                 |       |
| 713          | 800                      |                                  |    |    |            |                                     |     |     |                               |             |             | 606         | 206         |             | 590 | 190 |                       | 421,0 |
|              | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 714          | 400                      |                                  |    |    |            |                                     |     |     |                               |             |             | 400         | 800         |             | 400 | 800 |                       | 447,0 |
|              | X                        | 68                               | 68 |    |            | 260                                 | 200 | 180 |                               |             |             |             |             |             |     |     |                       |       |
| 715          |                          | 58                               | 48 |    |            | 230                                 | 180 | -   |                               |             |             |             |             |             |     |     | 461,0                 |       |
| 716          | 800                      |                                  |    |    |            |                                     |     |     |                               |             |             | 606         | 306         |             | 590 | 290 |                       | 524,0 |
|              | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 717          | 500                      |                                  |    |    |            |                                     |     |     |                               |             |             | 500         | 800         |             | 500 | 800 |                       | 556,0 |
|              | X                        | 68                               | 68 |    |            | 260                                 | 200 | 180 |                               |             |             |             |             |             |     |     |                       |       |
| 718          |                          | 58                               | 48 |    |            | 230                                 | 180 | -   |                               |             |             |             |             |             |     |     | 552,0                 |       |
| 719          | 800                      |                                  |    |    |            |                                     |     |     |                               |             |             | 606         | 406         |             | 590 | 390 |                       | 627,0 |
|              | X                        | 68                               | 58 | 38 | 50/52      | 250                                 | 200 | -   |                               |             |             | X           | X           |             | X   | X   |                       |       |
| 720          | 600                      |                                  |    |    |            |                                     |     |     |                               |             |             | 600         | 800         |             | 600 | 800 |                       | 665,0 |
|              | X                        | 68                               | 68 |    |            | 260                                 | 200 | 180 |                               |             |             |             |             |             |     |     |                       |       |



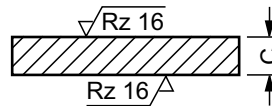
Mat.: C45

Toleranz Außenmaße /  
Tolerance of length and width



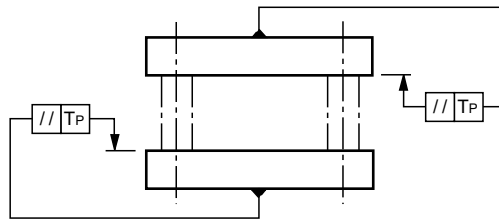
A x B +0,06  
-0,06

Toleranz Plattenstärke /  
Tolerance of thickness



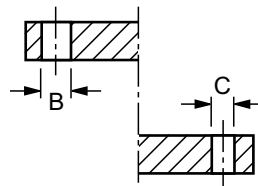
C ± 2

Parallelität der Flächenpaare /  
Parallelism of two surfaces



TP = 0,012 / 100 mm

Bohrungstoleranzen /  
Hole tolerances



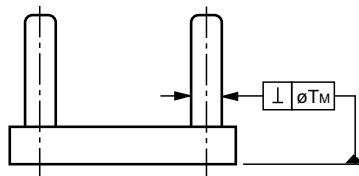
B = Aufnahmebohrung Buchse/ Mounting hole for bushing:

FS 4 .. = H6  
FS 6 .. = H6

C = Aufnahmebohrung Säule/ Mounting hole for leader pin:

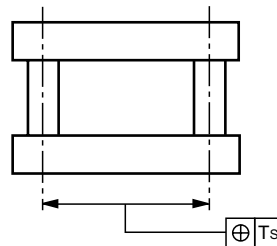
FS 320 = R7  
FS 319 = JS6

Winkelgenauigkeit der Führungssäulen /  
Angular accuracy of leader pins



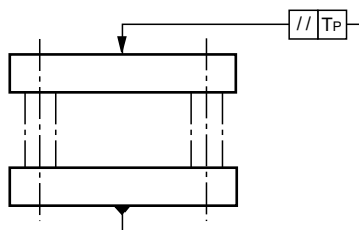
TM = 0,012 / 100 mm

Toleranz Systemabstände /  
Tolerance of dimensions between leader-  
pin (and bushing) - holes



Ts = ± 0,010

Planparallelität im  
zusammengebauten Zustand /  
Parallelism after mounting



TP = 0,015 / 100 mm

Bestellbeispiel / Order-example

| 2 C                           | 343                           | IEP                             | 141                           | Z  |
|-------------------------------|-------------------------------|---------------------------------|-------------------------------|--|
| Gestelltyp<br>Type of die set | Kataloggröße<br>Catalog sizes | Säulentyp<br>Type of leader pin | Buchsentyp<br>Type of bushing | Position der Haltestücke<br>Position of holding clamps |

**Gestelltyp / Type of die set**

**Position der Haltestücke / Position of holding clamps**

**Buchsentyp / Type of bushing**

**Stahlbuchse, RM-beschichtet**  
Leader pin bushing, RM plated

|           |           |           |
|-----------|-----------|-----------|
|           |           |           |
| FS 330 RM | FS 340 RM | FS 350 RM |
| 141       | 142       | 143       |

**Stahlbuchse mit Bronzeplattierung**  
Leader pin bushing, bronze plated

|        |        |        |
|--------|--------|--------|
|        |        |        |
| FS 331 | FS 351 | FS 355 |
| 131    | 132    | 133    |

**Stahlbuchse mit Ms-Käfig**  
Leader pin bushing with ball cage

|                 |                 |                 |
|-----------------|-----------------|-----------------|
|                 |                 |                 |
| FS 353 + FS 325 | FS 357 + FS 325 | FS 358 + FS 325 |
| 151             | 152             | 153             |

**Säulentyp / Type of leader pin**

|                             |  |
|-----------------------------|--|
| eingepresst<br>press-fitted | Schnellwechselsäule mit Bund<br>Leader pin with collar |
|                             |  |
| FS 320                      | FS 319   |
| IEP                         | IER  |



Bestellbeispiel / Order-example

| <b>3 C</b>                    | <b>343</b>                    | <b>IEP</b>                      | <b>182</b>                    | <b>Z</b>   |
|-------------------------------|-------------------------------|---------------------------------|-------------------------------|--|
| Gestelltyp<br>Type of die set | Kataloggröße<br>Catalog sizes | Säulentyp<br>Type of leader pin | Buchsentyp<br>Type of bushing | Position der Haltestücke<br>Position of holding clamps |

**Gestelltyp / Type of die set**

**Buchsentyp / Type of bushing**

|   |  |
|---|--|
| <b>Stahlbuchse, RM-beschichtet</b><br>Leader pin bushing, RM plated           |  |
| C1 = FS 440 RM<br>C3 = FS 430 RM  | C1 = FS 450 RM<br>C3 = FS 430 RM             |
| <b>182</b>  | <b>183</b>                                   |
| <b>Stahlbuchse mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |  |
| C1 = FS 651<br>C3 = FS 631  | C1 = FS 655<br>C3 = FS 631                   |
| <b>172</b>  | <b>173</b>                                   |
| <b>Stahlbuchse mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |  |
| C1 = FS 458 + FS 425<br>C3 = FS 457 + FS 425                                  | C1 = FS 453 + FS 425<br>C3 = FS 457 + FS 425 |
| <b>192</b>  | <b>193</b>                                   |

**Säulentyp / Type of leader pin**

|                             |  |
|-----------------------------|--|
| eingepresst<br>press-fitted | Schnellwechselsäule mit Bund<br>Leader pin with collar |
|                             |  |
| FS 420                      | FS 419   |
| <b>IEP</b>                  | <b>IER</b>   |

**Position der Haltestücke / Position of holding clamps**



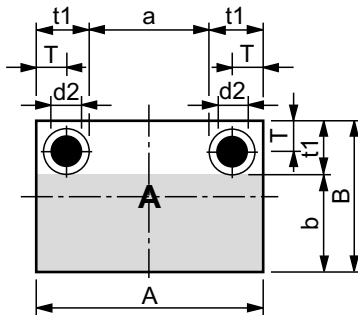
| Position<br>Position | Platten-<br>maße<br>Plate length<br>and width | Platten-<br>stärke<br>Plate<br>thickness |    |    | Säulentyp in C1<br>oder C2*<br>Type of leader pin<br>in C1 or C2* |             | Buchsentyp in C1<br>oder C2**<br>Type of bushing<br>in C1 or C2** |            | Buchsentyp<br>in C3<br>Type of bushing<br>in C3 |            | Haltestück-<br>position<br>Position of holding<br>clamps |
|----------------------|---|--|----|----|---|-------------|---|------------|---|------------|--|
|                      |   | A x B                                    | C1 | C2 | C3  | FS ...      | d1 x l  | FS ...     | d x l   | FS ...     |  |
| Q                    | 610 x 494                                     | 78                                       | 48 | 38 | 320   | 40/42 x 250 | 351   | 40/42 x 67 | 331   | 40/42 x 51 | X  |

\* = Säulentyp in C1 oder C2 bitte angeben. / Please fill in type of leader pin in C1 or C2.

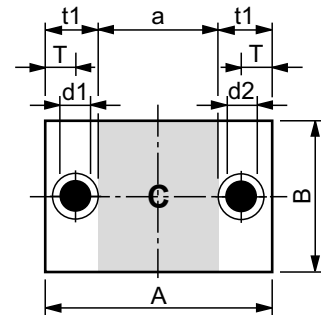
\*\* = Buchsentyp in C1 oder C2 bitte angeben. / Please fill in type of bushing in C1 or C2.

Arbeitsflächen / Working areas

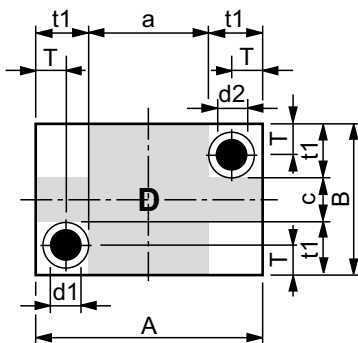
$b = B - t1$



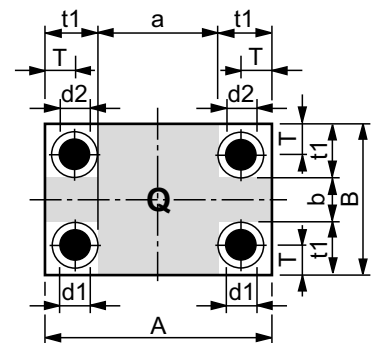
$a = A - (2 \times t1)$



$a = A - (2 \times t1)$   
 $c = B - (2 \times t1)$

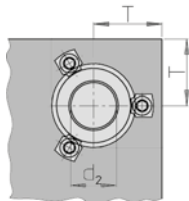


$a = A - (2 \times t1)$   
 $b = B - (2 \times t1)$



Führungsbuchsen mit Bund

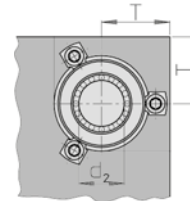
Leader pin bushings, with collar



| $d_1/d_2$ | T    |
|-----------|------|
| 19/20     | 35   |
| 24/25     | 40   |
| 30/32     | 43,5 |
| 38/40     | 51   |
| 48/50     | 57   |
| 60/63     | 68   |
| 80        | 76   |

Führungsbuchsen mit Bund

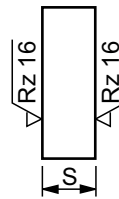
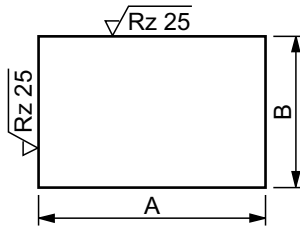
für Kugelführung  
Leader pin bushings, with collar  
for ball-bearings



| $d_1/d_2$ | T    |
|-----------|------|
| 19/20     | 35   |
| 24/25     | 40   |
| 30/32     | 43,5 |
| 38/40     | 51   |
| 48/50     | 57   |
| 60/63     | 68   |
| 80        | 76   |

Mat.: C45

Toleranz Außenmaße /  
Tolerance of length and width



A x B +0,06  
-0,06

S ± 2

Parallelität S / Parallelism S: 0,012 / 100 mm

| A x B     | S  |    |    |    |    |    |    |    |
|-----------|----|----|----|----|----|----|----|----|
|           | 18 | 23 | 28 | 33 | 38 | 48 | 58 | 68 |
| 125 x 125 | •  | •  | •  |    | •  |    |    |    |
| 160 x 125 | •  | •  | •  |    | •  |    |    |    |
| 160 x 160 | •  | •  | •  |    | •  |    |    |    |
| 200 x 125 | •  | •  | •  |    | •  |    |    |    |
| 200 x 160 | •  | •  | •  | •  | •  | •  |    |    |
| 200 x 200 | •  | •  | •  | •  | •  | •  |    |    |
| 250 x 125 | •  | •  | •  | •  | •  | •  |    |    |
| 250 x 160 | •  | •  | •  | •  | •  | •  |    |    |
| 250 x 200 |    | •  | •  | •  | •  | •  |    |    |
| 250 x 250 |    | •  | •  | •  | •  | •  |    |    |
| 300 x 160 |    | •  | •  | •  | •  | •  |    |    |
| 300 x 200 |    | •  | •  | •  | •  | •  |    |    |
| 300 x 250 |    |    | •  | •  | •  | •  |    |    |
| 300 x 300 |    |    | •  | •  | •  | •  |    |    |
| 350 x 200 |    | •  | •  | •  | •  | •  |    |    |
| 350 x 250 |    |    | •  | •  | •  | •  |    |    |
| 350 x 300 |    |    | •  | •  | •  | •  | •  |    |
| 350 x 350 |    |    | •  | •  | •  | •  | •  |    |
| 400 x 200 |    | •  | •  | •  | •  | •  |    |    |
| 400 x 250 |    |    | •  | •  | •  | •  |    |    |
| 400 x 300 |    |    |    | •  | •  | •  | •  |    |
| 400 x 350 |    |    |    | •  | •  | •  | •  |    |
| 400 x 400 |    |    |    | •  | •  | •  | •  |    |
| 500 x 250 |    |    | •  | •  | •  | •  |    |    |
| 500 x 300 |    |    |    | •  | •  | •  | •  |    |
| 500 x 350 |    |    |    | •  | •  | •  | •  |    |
| 500 x 400 |    |    |    | •  | •  | •  | •  |    |
| 500 x 500 |    |    |    | •  | •  | •  | •  | •  |
| 600 x 300 |    |    |    | •  | •  | •  | •  | •  |
| 600 x 350 |    |    |    | •  | •  | •  | •  | •  |
| 600 x 400 |    |    |    | •  | •  | •  | •  | •  |
| 600 x 500 |    |    |    |    | •  | •  | •  | •  |
| 600 x 600 |    |    |    |    | •  | •  | •  | •  |
| 700 x 350 |    |    |    | •  | •  | •  | •  | •  |
| 700 x 400 |    |    |    |    | •  | •  | •  | •  |
| 700 x 500 |    |    |    |    | •  | •  | •  | •  |
| 700 x 600 |    |    |    |    | •  | •  | •  | •  |
| 800 x 400 |    |    |    |    | •  | •  | •  | •  |
| 800 x 500 |    |    |    |    | •  | •  | •  | •  |
| 800 x 600 |    |    |    |    | •  | •  | •  | •  |

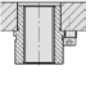
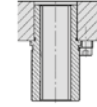
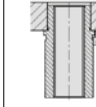
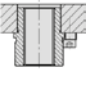
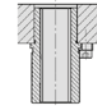
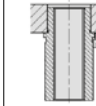
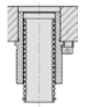
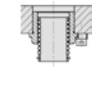
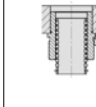
| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Stahlbuchse, RM-beschichtet<br>Leader pin bushing, RM plated           |                 |                 |
|  |                 |                 |
| FS 330 RM  | FS 340 RM       | FS 350 RM       |
| 141  | 142             | 143             |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 331   | FS 351          | FS 355          |
| 131  | 132             | 133             |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 353 + FS 325  | FS 357 + FS 325 | FS 358 + FS 325 |
| 151  | 152             | 153             |

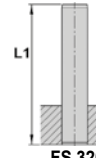
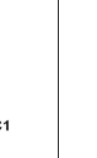
| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 320<br>IEP                  | FS 319<br>IER   |


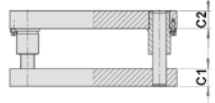
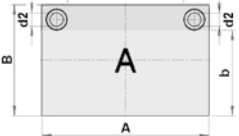
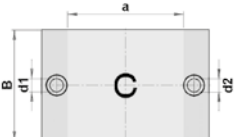

| Gestelltyp / Type of die set |  |
|------------------------------|--|
|                              |  |
|                              |  |
|                              |  |

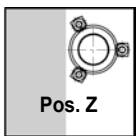
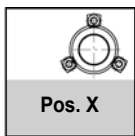
| Position der Haltestücke / Position of holding clamps |        |
|---|--------|
|   |        |
| Pos. Z  | Pos. X |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |             |             |             |             |             | Gewicht / Weight [kg] |                   |             |  |     |     |      |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------------|-------------|--|-----|-----|------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 141<br>131  |             |             | 142<br>132  |             |             | 143<br>133  |             |                       | 151<br>152<br>153 |             |  |     |     |      |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A |                       |                   | c<br>X<br>A |  |     |     |      |
| 301          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 7,0  |
| 302          | 125                      | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -                             |             |             |             | 15          | 70          | 15          |             |             |                       |                   |             |  | 70  |     | 7,7  |
| 303          | 125                      | 38                               | 28 | -  |            | 160                                 | 112 | -                             |             |             |             | 120         | 125         | 125         |             |             |                       |                   |             |  | 125 |     | 8,9  |
| 304          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 8,8  |
| 305          | 160                      | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -                             |             |             |             | 50          | 70          | 15          |             |             |                       |                   |             |  | 50  | 70  | 9,6  |
| 306          | 125                      | 38                               | 28 | -  |            | 160                                 | 112 | -                             |             |             |             | 125         | 160         | 160         |             |             |                       |                   |             |  | 125 | 160 | 11,2 |
| 307          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 11,0 |
| 308          | 160                      | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -                             |             |             |             | 50          | 105         | 50          |             |             |                       |                   |             |  | 50  | 105 | 12,0 |
| 309          | 160                      | 38                               | 28 | -  |            | 160                                 | 112 | -                             |             |             |             | 160         | 160         | 160         |             |             |                       |                   |             |  | 160 | 160 | 14,0 |
| 310          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 10,8 |
| 311          | 200                      | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -                             |             |             |             | 90          | 70          | 15          |             |             |                       |                   |             |  | 90  | 70  | 11,8 |
| 312          | 125                      | 38                               | 28 | -  |            | 160                                 | 112 | -                             |             |             |             | 125         | 200         | 200         |             |             |                       |                   |             |  | 125 | 200 | 13,7 |
| 313          |                          | 33                               | 28 | -  |            | 140                                 | 112 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 16,4 |
| 314          | 200                      | 33                               | 33 | -  | 24/25      | 160                                 | 125 | -                             |             |             |             | 72          | 96          | 32          |             |             |                       |                   |             |  | 70  | 95  | 17,6 |
| 315          | 160                      | 48                               | 38 | -  |            | 180                                 | 140 | -                             |             |             |             | 160         | 200         | 200         |             |             |                       |                   |             |  | 160 | 200 | 22,6 |
| 316          |                          | 33                               | 28 | -  |            | 140                                 | 112 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 20,2 |
| 317          | 200                      | 33                               | 33 | -  | 24/25      | 160                                 | 125 | -                             |             |             |             | 72          | 136         | 72          |             |             |                       |                   |             |  | 72  | 136 | 21,8 |
| 318          | 200                      | 48                               | 38 | -  |            | 180                                 | 140 | -                             |             |             |             | 200         | 200         | 200         |             |             |                       |                   |             |  | 200 | 200 | 28,0 |
| 319          |                          | 33                               | 28 | -  |            | 140                                 | 112 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 16,0 |
| 320          | 250                      | 33                               | 33 | -  | 24/25      | 160                                 | 125 | -                             |             |             |             | 122         | 61          |             |             |             |                       |                   |             |  | 122 | 61  | 17,3 |
| 321          | 125                      | 48                               | 38 | -  |            | 180                                 | 140 | -                             |             |             |             | 125         | 250         |             |             |             |                       |                   |             |  | 125 | 250 | 22,1 |
| 322          |                          | 33                               | 28 | -  |            | 140                                 | 112 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 20,2 |
| 323          | 250                      | 33                               | 33 | -  | 24/25      | 160                                 | 125 | -                             |             |             |             | 122         | 96          | 32          |             |             |                       |                   |             |  | 122 | 96  | 21,8 |
| 324          | 160                      | 48                               | 38 | -  |            | 180                                 | 140 | -                             |             |             |             | 160         | 250         | 250         |             |             |                       |                   |             |  | 160 | 250 | 28,0 |
| 325          |                          | 33                               | 28 | -  |            | 140                                 | 112 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 25,0 |
| 326          | 250                      | 33                               | 33 | -  | 24/25      | 160                                 | 125 | -                             |             |             |             | 122         | 136         | 72          |             |             |                       |                   |             |  | 122 | 136 | 27,0 |
| 327          | 200                      | 48                               | 38 | -  |            | 180                                 | 140 | -                             |             |             |             | 200         | 250         | 250         |             |             |                       |                   |             |  | 200 | 250 | 34,8 |
| 328          |                          | 38                               | 33 | -  |            | 160                                 | 125 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |     |     | 36,4 |
| 329          | 250                      | 38                               | 38 | -  | 30/32      | 180                                 | 140 | -                             |             |             |             | 106         | 178         | 106         |             |             |                       |                   |             |  | 106 | 178 | 38,8 |
| 330          | 250                      | 48                               | 38 | -  |            | 180                                 | 140 | -                             |             |             |             | 250         | 250         | 250         |             |             |                       |                   |             |  | 250 | 250 | 43,7 |

| Buchsentyp / Type of bushing  |   |   |
|---|---|---|
| Stahlbuchse, RM-beschichtet<br>Leader pin bushing, RM plated                      |   |   |
|  |  |  |
| FS 330 RM   | FS 340 RM   | FS 350 RM   |
| 141   | 142   | 143   |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated            |   |   |
|  |  |  |
| FS 331  | FS 351  | FS 355  |
| 131   | 132   | 133   |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage                     |   |   |
|  |  |  |
| FS 353 + FS 325   | FS 357 + FS 325   | FS 358 + FS 325   |
| 151   | 152   | 153   |

| Säulentyp / Type of leader pin  |   |
|---|---|
| eingepresst<br>press-fitted   | Schnellwechselsäule mit Bund<br>Leader pin, with collar                             |
|  |  |
| FS 320  | FS 319  |
| IEP   | IER   |

| Gestelltyp / Type of die set  |   |
|---|---|
|  |  |
|  |  |
|  |   |

| Position der Haltestücke / Position of holding clamps                               |   |
|---|---|
|  |  |
| Pos. Z  | Pos. X  |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     | Arbeitsflächen / Working area |    |             |             |             |             |             |             |             | Gewicht / Weight [kg] |             |                   |             |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-------------------------------|----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------------|-------------|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |                               |    | 141<br>131  |             |             | 142<br>132  |             |             | 143<br>133  |                       |             | 151<br>152<br>153 |             |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2                            | L3 | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B |                       | b<br>X<br>A |                   | c<br>X<br>A |       |
| 331          |                          | 33                               | 28 | -  |            | 140                                 | 112                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 24,0  |
| 332          | 300                      | 33                               | 33 | -  | 24/25      | 160                                 | 126                           | -  |             |             |             | 172         | 96          | 32          | 172         | 96                    | 32          |                   |             | 25,9  |
|              | X                        | 33                               | 33 | -  |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
|              | 160                      |                                  |    |    |            |                                     |                               |    |             |             |             | 160         | 300         | 300         | 160         | 300                   | 300         |                   |             | 33,4  |
| 333          |                          | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             |       |
| 334          | 300                      | 33                               | 28 | -  |            | 140                                 | 112                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 29,8  |
| 335          | X                        | 33                               | 33 | -  | 24/25      | 160                                 | 125                           | -  |             |             |             | 172         | 136         | 72          | 172         | 136                   | 72          |                   |             | 32,1  |
|              | 200                      |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
| 336          |                          | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 41,5  |
| 337          | 300                      | 38                               | 33 | -  |            | 160                                 | 125                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 43,3  |
| 338          | X                        | 38                               | 38 | -  | 30/32      | 180                                 | 140                           | -  |             |             |             | 156         | 178         | 106         | 156         | 178                   | 106         |                   |             | 46,3  |
|              | 250                      |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
| 339          |                          | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 52,5  |
| 340          | 300                      | 38                               | 33 | -  |            | 160                                 | 125                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 52,0  |
| 341          | X                        | 38                               | 38 | -  | 30/32      | 180                                 | 140                           | -  |             |             |             | 156         | 228         | 156         | 156         | 228                   | 156         |                   |             | 55,5  |
|              | 300                      |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
| 342          |                          | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 62,5  |
| 343          | 350                      | 33                               | 28 | -  |            | 140                                 | 112                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 34,6  |
| 344          | X                        | 33                               | 33 | -  | 24/25      | 160                                 | 125                           | -  |             |             |             | 222         | 136         | 72          | 222         | 136                   | 72          |                   |             | 37,3  |
|              | 200                      |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
| 345          |                          | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 48,3  |
| 346          | 350                      | 38                               | 33 | -  |            | 160                                 | 125                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 50,5  |
| 347          | X                        | 38                               | 38 | -  | 30/32      | 180                                 | 140                           | -  |             |             |             | 206         | 178         | 106         | 206         | 178                   | 106         |                   |             | 54,0  |
|              | 250                      |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
| 348          |                          | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 61,0  |
| 349          | 350                      | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 74,0  |
| 350          | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160                           | -  |             |             |             | 182         | 216         | 132         | 182         | 216                   | 132         |                   |             | 82,5  |
|              | 300                      |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
| 351          |                          | 58                               | 48 | -  |            | 224                                 | 160                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 90,5  |
| 352          | 350                      | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 86,0  |
| 353          | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160                           | -  |             |             |             | 182         | 266         | 182         | 182         | 266                   | 182         |                   |             | 95,5  |
|              | 350                      |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
| 354          |                          | 58                               | 48 | -  |            | 224                                 | 160                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 105,0 |
| 355          | 400                      | 33                               | 28 | -  |            | 140                                 | 112                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 39,4  |
| 356          | X                        | 33                               | 33 | -  | 24/25      | 160                                 | 125                           | -  |             |             |             | 272         | 136         | 72          | 272         | 136                   | 72          |                   |             | 42,5  |
|              | 200                      |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
| 357          |                          | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 55,0  |
| 358          | 400                      | 38                               | 33 | -  |            | 160                                 | 125                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 57,5  |
| 359          | X                        | 38                               | 38 | -  | 30/32      | 180                                 | 140                           | -  |             |             |             | 256         | 178         | 106         | 256         | 178                   | 106         |                   |             | 61,5  |
|              | 250                      |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           | X           | X           | X                     | X           |                   |             |       |
| 360          |                          | 48                               | 38 | -  |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |                   |             | 69,0  |

| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Stahlbuchse, RM-beschichtet<br>Leader pin bushing, RM plated           |                 |                 |
|  |                 |                 |
| FS 330 RM  | FS 340 RM       | FS 350 RM       |
| 141  | 142             | 143             |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 331   | FS 351          | FS 355          |
| 131  | 132             | 133             |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 353 + FS 325  | FS 357 + FS 325 | FS 358 + FS 325 |
| 151  | 152             | 153             |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 320                         | FS 319  |
| IEP                            | IER   |

| Gestelltyp / Type of die set |  |
|------------------------------|--|
|                              |  |
|                              |  |
|                              |  |

| Position der Haltestücke / Position of holding clamps |        |
|---|--------|
|   |        |
| Pos. Z  | Pos. X |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |    | Arbeitsflächen / Working area |             |             |             |             |             |             |             |             | Gewicht / Weight [kg] |                   |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |    | 141<br>131                    |             |             | 142<br>132  |             |             | 143<br>133  |             |             |                       | 151<br>152<br>153 |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3 | a<br>X<br>B                   | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |                       |                   |
| 361          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 84,0              |
| 362          | 400                      | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 232         | 216         | 132         | 232         | 216         | 132         |                       | 93,5              |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 300                      |                                  |    |    |            |                                     |     |    |                               |             |             | 300         | 400         | 400         | 300         | 400         | 400         |                       | 103,0             |
| 363          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |
| 364          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 97,5              |
| 365          | 400                      | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 232         | 266         | 182         | 232         | 266         | 182         |                       | 109,0             |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 350                      |                                  |    |    |            |                                     |     |    |                               |             |             | 350         | 400         | 400         | 350         | 400         | 400         |                       | 120,0             |
| 366          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |
| 367          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 111,0             |
| 368          | 400                      | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 232         | 316         | 232         | 232         | 316         | 232         |                       | 124,0             |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             | 400         | 400         | 400         | 400         | 400         | 400         |                       | 137,0             |
| 369          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |
| 370          |                          | 38                               | 33 | -  |            | 160                                 | 125 | -  |                               |             |             |             |             |             |             |             |             |                       | 73,0              |
| 371          | 500                      | 38                               | 38 | -  | 30/32      | 180                                 | 140 | -  |                               |             |             | 356         | 178         | 106         | 356         | 178         | 106         |                       | 78,0              |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 250                      |                                  |    |    |            |                                     |     |    |                               |             |             | 250         | 500         | 500         | 250         | 500         | 500         |                       | 87,5              |
| 372          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |
| 373          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 105,0             |
| 374          | 500                      | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 332         | 216         | 132         | 332         | 216         | 132         |                       | 116,0             |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 300                      |                                  |    |    |            |                                     |     |    |                               |             |             | 300         | 500         | 500         | 300         | 500         | 500         |                       | 128,0             |
| 375          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |
| 376          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 122,0             |
| 377          | 500                      | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 332         | 266         | 182         | 332         | 266         | 182         |                       | 135,0             |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 350                      |                                  |    |    |            |                                     |     |    |                               |             |             | 350         | 500         | 500         | 350         | 500         | 500         |                       | 149,0             |
| 378          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |
| 379          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 138,0             |
| 380          | 500                      | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 332         | 316         | 232         | 332         | 316         | 232         |                       | 154,0             |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             | 400         | 500         | 500         | 400         | 500         | 500         |                       | 170,0             |
| 381          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |
| 382          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 213,0             |
| 383          | 500                      | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -  |                               |             |             | 306         | 403         | 306         | 306         | 403         | 306         |                       | 233,0             |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             | 500         | 500         | 500         | 500         | 500         | 500         |                       | 252,0             |
| 384          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |
| 385          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 155,0             |
| 386          | 600                      | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -  |                               |             |             | 406         | 203         | 106         | 406         | 203         | 106         |                       | 169,0             |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 300                      |                                  |    |    |            |                                     |     |    |                               |             |             | 300         | 600         | 600         | 300         | 600         | 600         |                       | 183,0             |
| 387          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |
| 388          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 180,0             |
| 389          | 600                      | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -  |                               |             |             | 406         | 253         | 156         | 406         | 253         | 156         |                       | 196,0             |
|              | X                        |                                  |    |    |            |                                     |     |    |                               |             |             | X           | X           | X           | X           | X           | X           |                       |                   |
|              | 350                      |                                  |    |    |            |                                     |     |    |                               |             |             | 350         | 600         | 600         | 350         | 600         | 600         |                       | 213,0             |
| 390          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |                   |

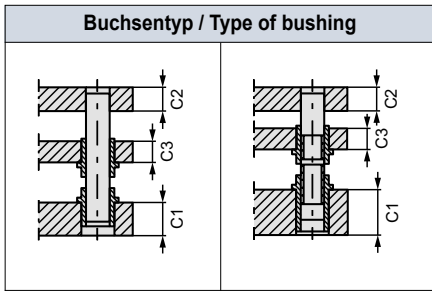
| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Stahlbuchse, RM-beschichtet<br>Leader pin bushing, RM plated           |                 |                 |
|  |                 |                 |
| FS 330 RM  | FS 340 RM       | FS 350 RM       |
| 141  | 142             | 143             |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 331   | FS 351          | FS 355          |
| 131  | 132             | 133             |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 353 + FS 325  | FS 357 + FS 325 | FS 358 + FS 325 |
| 151  | 152             | 153             |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 320                         | FS 319  |
| IEP                            | IER   |

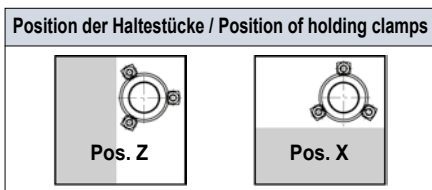
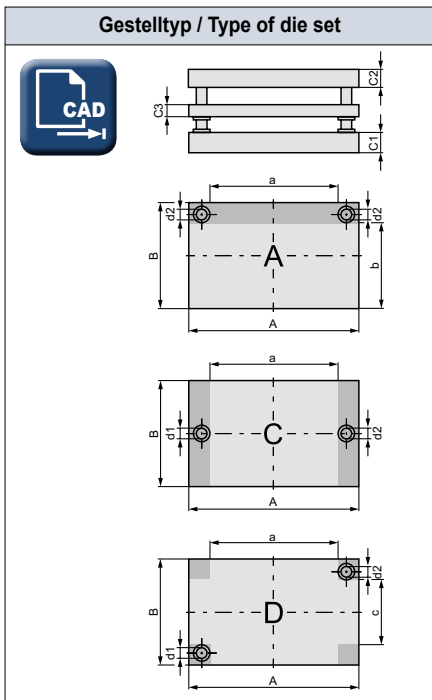
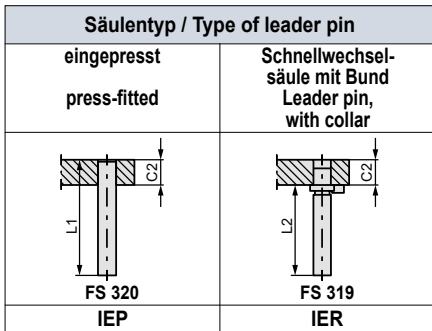
| Gestelltyp / Type of die set |  |
|------------------------------|--|
|                              |  |
|                              |  |
|                              |  |

| Position der Haltestücke / Position of holding clamps |        |
|---|--------|
|   |        |
| Pos. Z  | Pos. X |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |             |             |             |             |             | Gewicht / Weight [kg] |                   |             |  |  |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------------|-------------|--|--|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 141<br>131  |             |             | 142<br>132  |             |             | 143<br>133  |             |                       | 151<br>152<br>153 |             |  |  |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A |                       |                   | c<br>X<br>A |  |  |       |
| 391          | 600                      | 58                               | 48 | -  | -          | 224                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 205,0 |
| 392          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 224,0 |
| 393          | 400                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 242,0 |
| 394          | 600                      | 58                               | 48 | -  | -          | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 254,0 |
| 395          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 278,0 |
| 396          | 500                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 302,0 |
| 397          | 600                      | 58                               | 48 | -  | -          | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 305,0 |
| 398          | X                        | 58                               | 58 | -  | 48/50      | 234                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 333,0 |
| 399          | 600                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 361,0 |
| 400          | 700                      | 58                               | 48 | -  | -          | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 209,0 |
| 401          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 228,0 |
| 402          | 350                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 247,0 |
| 403          | 700                      | 58                               | 48 | -  | -          | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 238,0 |
| 404          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 260,0 |
| 405          | 400                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 282,0 |
| 406          | 700                      | 58                               | 48 | -  | -          | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 296,0 |
| 407          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 324,0 |
| 408          | 500                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 351,0 |
| 409          | 700                      | 58                               | 48 | -  | -          | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 354,0 |
| 410          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 388,0 |
| 411          | 600                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 420,0 |
| 412          | 800                      | 58                               | 48 | -  | -          | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 271,0 |
| 413          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 296,0 |
| 414          | 400                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 321,0 |
| 415          | 800                      | 58                               | 48 | -  | -          | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 338,0 |
| 416          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 369,0 |
| 417          | 500                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 400,0 |
| 418          | 800                      | 58                               | 48 | -  | -          | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 404,0 |
| 419          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 442,0 |
| 420          | 600                      | 68                               | 58 | -  | -          | 250                                 | 180 | -                             |             |             |             |             |             |             |             |             |                       |                   |             |  |  | 480,0 |



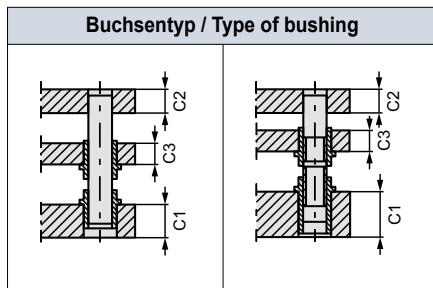
|   |                     |
|---|---------------------|
| <b>Stahlbuchse, RM-beschichtet</b><br>Leader pin bushing, RM plated           |                     |
| C1: FS 440 RM   | C1: FS 450 RM       |
| C3: FS 430 RM   | C3: FS 430 RM       |
| 182   | 183                 |
| <b>Stahlbuchse mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |                     |
| C1: FS 651  | C1: FS 655          |
| C3: FS 631  | C3: FS 631          |
| 172   | 173                 |
| <b>Stahlbuchse mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425   | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425   | C3: FS 457 + FS 425 |
| 192   | 193                 |



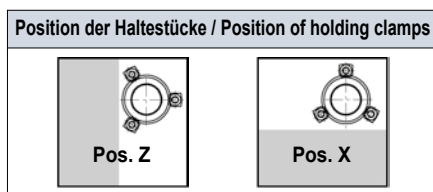
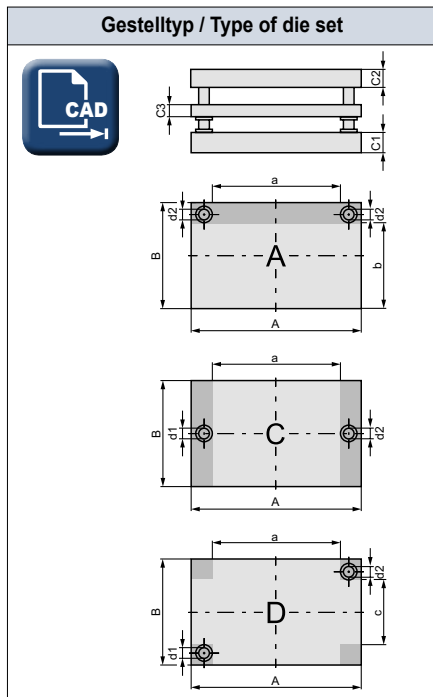
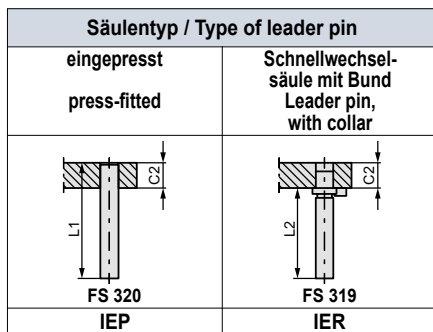
| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |     | Arbeitsflächen / Working area |             |             |             |             |             | Gewicht / Weight [kg] |            |     |      |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-----------------------|------------|-----|------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |     | 182<br>172                    |             |             | 183<br>173  |             |             |                       | 192<br>193 |     |      |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3  | a<br>X<br>B                   | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |                       |            |     |      |
| 301          |                          | 28                               | 23 |    |            | 140                                 | 125 | -   |                               |             |             |             |             |             |                       |            | 9,4 |      |
| 302          | 125                      | X                                | 38 | 28 | 23         | 19/20                               | 160 | 140 | -                             |             |             | 15          | 70          | 15          | 15                    | 70         | 15  | 11,2 |
|              | 125                      |                                  | 38 | 28 |            |                                     | 160 | 140 | -                             |             |             | 125         | 125         | 125         | 125                   | 125        | 125 | 12,4 |
| 303          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -                             |             |             |             |             |             |                       |            |     | 12,4 |
| 304          |                          |                                  | 28 | 23 |            |                                     | 140 | 125 | -                             |             |             |             |             |             |                       |            |     | 11,7 |
| 305          | 160                      | X                                | 38 | 28 | 23         | 19/20                               | 160 | 140 | -                             |             |             | 50          | 70          | 15          | 50                    | 70         | 15  | 14,2 |
|              | 125                      |                                  | 38 | 28 |            |                                     | 160 | 140 | -                             |             |             | 125         | 160         | 160         | 125                   | 160        | 160 | 15,8 |
| 306          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -                             |             |             |             |             |             |                       |            |     | 15,8 |
| 307          |                          |                                  | 28 | 23 |            |                                     | 140 | 125 | -                             |             |             |             |             |             |                       |            |     | 14,8 |
| 308          | 160                      | X                                | 38 | 28 | 23         | 19/20                               | 160 | 140 | -                             |             |             | 50          | 105         | 50          | 50                    | 105        | 50  | 17,8 |
|              | 160                      |                                  | 38 | 28 |            |                                     | 160 | 140 | -                             |             |             | 160         | 160         | 160         | 160                   | 160        | 160 | 19,8 |
| 309          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -                             |             |             |             |             |             |                       |            |     | 19,8 |
| 310          |                          |                                  | 28 | 23 |            |                                     | 140 | 125 | -                             |             |             |             |             |             |                       |            |     | 14,4 |
| 311          | 200                      | X                                | 38 | 28 | 23         | 19/20                               | 160 | 140 | -                             |             |             | 90          | 70          | 15          | 90                    | 70         | 15  | 17,4 |
|              | 125                      |                                  | 38 | 28 |            |                                     | 160 | 140 | -                             |             |             | 125         | 200         | 200         | 125                   | 200        | 200 | 19,4 |
| 312          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -                             |             |             |             |             |             |                       |            |     | 19,4 |
| 313          |                          |                                  | 33 | 28 |            |                                     | 160 | 125 | -                             |             |             |             |             |             |                       |            |     | 22,3 |
| 314          | 200                      | X                                | 48 | 38 | 23         | 24/25                               | 180 | 160 | -                             |             |             | 72          | 96          | 32          | 72                    | 96         | 32  | 28,4 |
|              | 160                      |                                  | 48 | 38 |            |                                     | 180 | 160 | -                             |             |             | 160         | 200         | 200         | 160                   | 200        | 200 | 30,9 |
| 315          |                          |                                  | 48 | 48 |            |                                     | 200 | 160 | -                             |             |             |             |             |             |                       |            |     | 30,9 |
| 316          |                          |                                  | 33 | 28 |            |                                     | 160 | 125 | -                             |             |             |             |             |             |                       |            |     | 27,5 |
| 317          | 200                      | X                                | 48 | 38 | 23         | 24/25                               | 180 | 160 | -                             |             |             | 72          | 136         | 72          | 72                    | 136        | 72  | 35,2 |
|              | 200                      |                                  | 48 | 38 |            |                                     | 180 | 160 | -                             |             |             | 200         | 200         | 200         | 200                   | 200        | 200 | 38,4 |
| 318          |                          |                                  | 48 | 48 |            |                                     | 200 | 160 | -                             |             |             |             |             |             |                       |            |     | 38,4 |
| 319          |                          |                                  | 33 | 28 |            |                                     | 160 | 125 | -                             |             |             |             |             |             |                       |            |     | 21,8 |
| 320          | 250                      | X                                | 48 | 38 | 23         | 24/25                               | 180 | 160 | -                             |             |             | 122         | 61          |             | 122                   | 61         |     | 27,8 |
|              | 125                      |                                  | 48 | 38 |            |                                     | 180 | 160 | -                             |             |             | 125         | 250         |             | 125                   | 250        |     | 30,2 |
| 321          |                          |                                  | 48 | 48 |            |                                     | 200 | 160 | -                             |             |             |             |             |             |                       |            |     | 30,2 |
| 322          |                          |                                  | 33 | 28 |            |                                     | 160 | 125 | -                             |             |             |             |             |             |                       |            |     | 27,5 |
| 323          | 250                      | X                                | 48 | 38 | 23         | 24/25                               | 180 | 160 | -                             |             |             | 122         | 96          | 32          | 122                   | 96         | 32  | 35,2 |
|              | 160                      |                                  | 48 | 38 |            |                                     | 180 | 160 | -                             |             |             | 160         | 250         | 250         | 160                   | 250        | 250 | 38,4 |
| 324          |                          |                                  | 48 | 48 |            |                                     | 200 | 160 | -                             |             |             |             |             |             |                       |            |     | 38,4 |
| 325          |                          |                                  | 33 | 28 |            |                                     | 160 | 125 | -                             |             |             |             |             |             |                       |            |     | 34,2 |
| 326          | 250                      | X                                | 48 | 38 | 23         | 24/25                               | 180 | 160 | -                             |             |             | 122         | 136         | 72          | 122                   | 136        | 72  | 43,8 |
|              | 200                      |                                  | 48 | 38 |            |                                     | 180 | 160 | -                             |             |             | 200         | 250         | 250         | 200                   | 250        | 250 | 47,7 |
| 327          |                          |                                  | 48 | 48 |            |                                     | 200 | 160 | -                             |             |             |             |             |             |                       |            |     | 47,7 |
| 328          |                          |                                  | 38 | 33 |            |                                     | 180 | 125 | -                             |             |             |             |             |             |                       |            |     | 50,5 |
| 329          | 250                      | X                                | 48 | 38 | 33         | 30/32                               | 200 | 160 | -                             |             |             | 106         | 178         | 106         | 106                   | 178        | 106 | 57,5 |
|              | 250                      |                                  | 48 | 38 |            |                                     | 200 | 160 | -                             |             |             | 250         | 250         | 250         | 250                   | 250        | 250 | 62,5 |
| 330          |                          |                                  | 48 | 48 |            |                                     | 200 | 160 | -                             |             |             |             |             |             |                       |            |     | 62,5 |



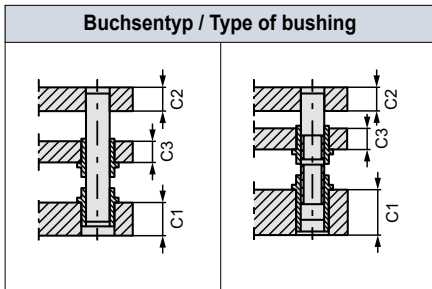
SÄULENGESTELLE / DIE SETS



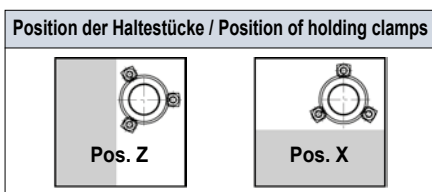
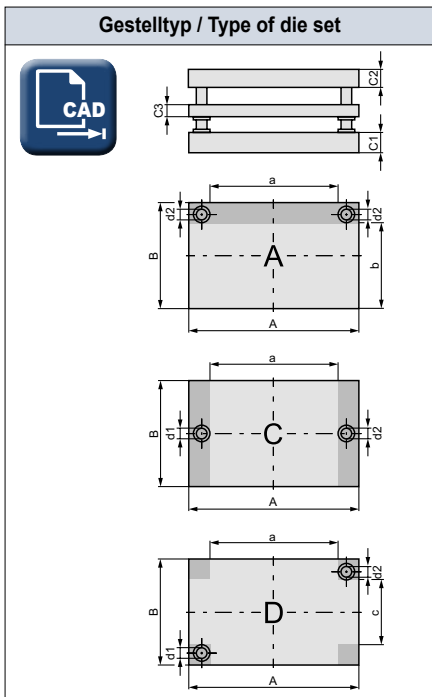
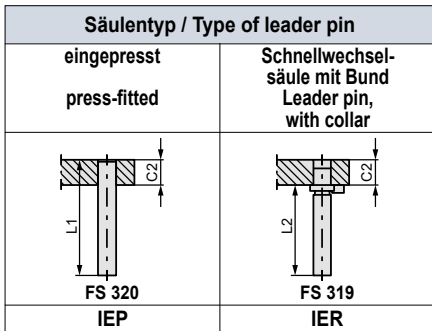
|   |  |
|---|--|
| <b>Stahlbuchse, RM-beschichtet</b><br>Leader pin bushing, RM plated           |  |
| C1: FS 440 RM<br>C3: FS 430 RM  | C1: FS 450 RM<br>C3: FS 430 RM             |
| 182   | 183  |
| <b>Stahlbuchse mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |  |
| C1: FS 651<br>C3: FS 631  | C1: FS 655<br>C3: FS 631                   |
| 172   | 173  |
| <b>Stahlbuchse mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |  |
| C1: FS 458 + FS 425<br>C3: FS 457 + FS 425                                    | C1: FS 453 + FS 425<br>C3: FS 457 + FS 425 |
| 192   | 193  |



| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     | Arbeitsflächen / Working area |    |             |             |             |             | Gewicht / Weight [kg] |             |             |             |             |             |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-------------------------------|----|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------|-------------|-------------|-------------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |                               |    | 182<br>172  |             |             | 183<br>173  |                       |             | 192<br>193  |             |             |             |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2                            | L3 | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B |                       | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |
| 331          |                          | 33                               | 28 |    |            | 160                                 | 125                           | -  |             |             |             |             |                       |             |             |             |             | 32,8        |
| 332          | 300                      | 48                               | 38 | 23 | 24/25      | 180                                 | 160                           | -  |             |             |             | 172         | 96                    | 32          | 172         | 96          | 32          | 42,1        |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 160                      |                                  |    |    |            |                                     |                               |    |             |             |             | 160         | 300                   | 300         | 160         | 300         | 300         | 45,9        |
| 333          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             |             |
| 334          |                          | 33                               | 28 |    |            | 160                                 | 125                           | -  |             |             |             |             |                       |             |             |             |             | 40,7        |
| 335          | 300                      | 48                               | 38 | 23 | 24/25      | 180                                 | 160                           | -  |             |             |             | 172         | 136                   | 72          | 172         | 136         | 72          | 52,5        |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 200                      |                                  |    |    |            |                                     |                               |    |             |             |             | 200         | 300                   | 300         | 200         | 300         | 300         | 57,5        |
| 336          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             |             |
| 337          |                          | 38                               | 33 |    |            | 180                                 | 140                           | -  |             |             |             |             |                       |             |             |             |             | 60,0        |
| 338          | 300                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 156         | 178                   | 106         | 156         | 178         | 106         | 69,0        |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 250                      |                                  |    |    |            |                                     |                               |    |             |             |             | 250         | 300                   | 300         | 250         | 300         | 300         | 74,5        |
| 339          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             |             |
| 340          |                          | 38                               | 33 |    |            | 180                                 | 140                           | -  |             |             |             |             |                       |             |             |             |             | 71,5        |
| 341          | 300                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 156         | 228                   | 156         | 156         | 228         | 156         | 82,5        |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 300                      |                                  |    |    |            |                                     |                               |    |             |             |             | 300         | 300                   | 300         | 300         | 300         | 300         | 89,5        |
| 342          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             |             |
| 343          |                          | 33                               | 28 |    |            | 160                                 | 125                           | -  |             |             |             |             |                       |             |             |             |             | 47,3        |
| 344          | 350                      | 48                               | 38 | 23 | 24/25      | 180                                 | 160                           | -  |             |             |             | 222         | 136                   | 72          | 222         | 136         | 72          | 60,5        |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 200                      |                                  |    |    |            |                                     |                               |    |             |             |             | 200         | 350                   | 350         | 200         | 350         | 350         | 66,5        |
| 345          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             |             |
| 346          |                          | 38                               | 33 |    |            | 180                                 | 140                           | -  |             |             |             |             |                       |             |             |             |             | 69,5        |
| 347          | 350                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 206         | 178                   | 106         | 206         | 178         | 106         | 80,0        |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 250                      |                                  |    |    |            |                                     |                               |    |             |             |             | 250         | 350                   | 350         | 250         | 350         | 350         | 87,0        |
| 348          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             |             |
| 349          |                          | 48                               | 38 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             | 101,0       |
| 350          | 350                      | 58                               | 48 | 38 | 38/40      | 224                                 | 180                           | -  |             |             |             | 182         | 216                   | 132         | 182         | 216         | 132         | 118,0       |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 300                      |                                  |    |    |            |                                     |                               |    |             |             |             | 300         | 350                   | 350         | 300         | 350         | 350         | 126,0       |
| 351          |                          | 58                               | 58 |    |            | 250                                 | 180                           | -  |             |             |             |             |                       |             |             |             |             |             |
| 352          |                          | 48                               | 38 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             | 118,0       |
| 353          | 350                      | 58                               | 48 | 38 | 38/40      | 224                                 | 180                           | -  |             |             |             | 182         | 266                   | 182         | 182         | 266         | 182         | 137,0       |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 350                      |                                  |    |    |            |                                     |                               |    |             |             |             | 350         | 350                   | 350         | 350         | 350         | 350         | 147,0       |
| 354          |                          | 58                               | 58 |    |            | 250                                 | 180                           | -  |             |             |             |             |                       |             |             |             |             |             |
| 355          |                          | 33                               | 28 |    |            | 160                                 | 125                           | -  |             |             |             |             |                       |             |             |             |             | 54,0        |
| 356          | 400                      | 48                               | 38 | 23 | 24/25      | 180                                 | 160                           | -  |             |             |             | 272         | 136                   | 72          | 272         | 136         | 72          | 69,5        |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 200                      |                                  |    |    |            |                                     |                               |    |             |             |             | 200         | 400                   | 400         | 200         | 400         | 400         | 75,0        |
| 357          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             |             |
| 358          |                          | 38                               | 33 |    |            | 180                                 | 125                           | -  |             |             |             |             |                       |             |             |             |             | 79,5        |
| 359          | 400                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 256         | 178                   | 106         | 256         | 178         | 106         | 91,0        |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X                     | X           | X           | X           | X           |             |
|              | 250                      |                                  |    |    |            |                                     |                               |    |             |             |             | 250         | 400                   | 400         | 250         | 400         | 400         | 99,0        |
| 360          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |                       |             |             |             |             |             |

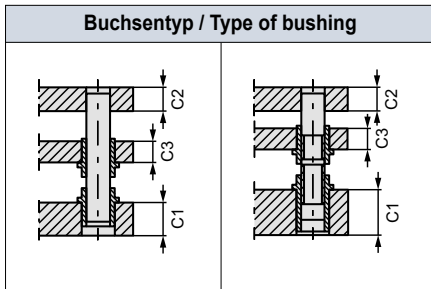


|   |                     |
|---|---------------------|
| <b>Stahlbuchse, RM-beschichtet</b><br>Leader pin bushing, RM plated           |                     |
| C1: FS 440 RM   | C1: FS 450 RM       |
| C3: FS 430 RM   | C3: FS 430 RM       |
| 182   | 183                 |
| <b>Stahlbuchse mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |                     |
| C1: FS 651  | C1: FS 655          |
| C3: FS 631  | C3: FS 631          |
| 172   | 173                 |
| <b>Stahlbuchse mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425   | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425   | C3: FS 457 + FS 425 |
| 192   | 193                 |

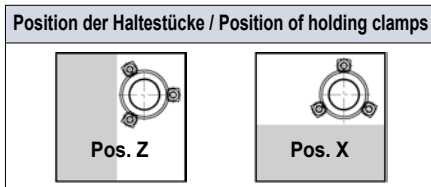
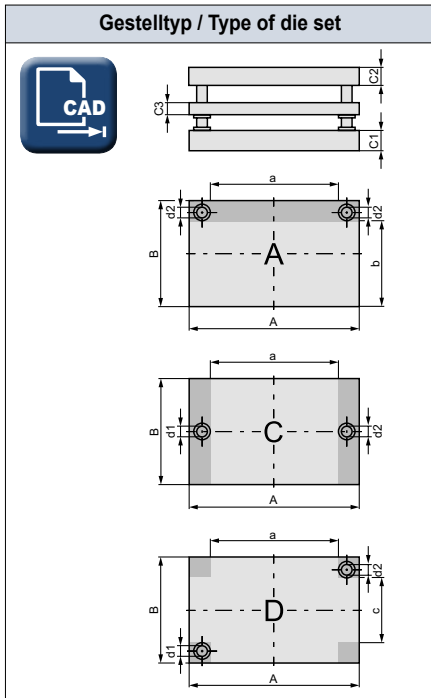
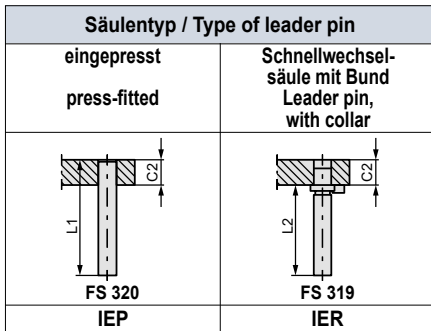


| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |    | Arbeitsflächen / Working area |             |             |             |             |             | Gewicht / Weight [kg] |             |             |             |  |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------|-------------|--|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |    | 182<br>172                    |             |             | 183<br>173  |             |             |                       | 192<br>193  |             |             |  |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3 | a<br>X<br>B                   | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |                       | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |  |
| 361          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |                       |             |             | 115,0       |  |
| 362          | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             |             | 232         | 216         | 132         | 232                   | 216         | 132         | 134,0       |  |
| 300          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 300         | 400         | 400         | 300                   | 400         | 400         |             |  |
| 363          |                          | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             |             |             |             |             |                       |             |             | 144,0       |  |
| 364          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |                       |             |             | 134,0       |  |
| 365          | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             |             | 232         | 266         | 182         | 232                   | 266         | 182         | 156,0       |  |
| 350          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 350         | 400         | 400         | 350                   | 400         | 400         | 167,0       |  |
| 366          |                          | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             |             |             |             |             |                       |             |             | 167,0       |  |
| 367          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |                       |             |             | 153,0       |  |
| 368          | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             |             | 232         | 316         | 232         | 232                   | 316         | 232         | 178,0       |  |
| 400          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 400         | 400         | 400         | 400                   | 400         | 400         | 190,0       |  |
| 369          |                          | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             |             |             |             |             |                       |             |             | 190,0       |  |
| 370          |                          | 38                               | 33 |    |            | 180                                 | 140 | -  |                               |             |             |             |             |             |                       |             |             | 99,0        |  |
| 371          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 48                               | 38 | 33 | 30/32      | 200                                 | 160 | -  |                               |             |             | 356         | 178         | 106         | 356                   | 178         | 106         | 114,0       |  |
| 250          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 250         | 500         | 500         | 250                   | 500         | 500         | 124,0       |  |
| 372          |                          | 48                               | 48 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |                       |             |             | 124,0       |  |
| 373          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |                       |             |             | 143,0       |  |
| 374          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             |             | 332         | 216         | 132         | 332                   | 216         | 132         | 167,0       |  |
| 300          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 300         | 500         | 500         | 300                   | 500         | 500         | 179,0       |  |
| 375          |                          | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             |             |             |             |             |                       |             |             | 179,0       |  |
| 376          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |                       |             |             | 167,0       |  |
| 377          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             |             | 332         | 266         | 182         | 332                   | 266         | 182         | 194,0       |  |
| 350          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 350         | 500         | 500         | 350                   | 500         | 500         | 208,0       |  |
| 378          |                          | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             |             |             |             |             |                       |             |             | 208,0       |  |
| 379          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |                       |             |             | 190,0       |  |
| 380          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             |             | 332         | 316         | 232         | 332                   | 316         | 232         | 222,0       |  |
| 400          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 400         | 500         | 500         | 400                   | 500         | 500         | 237,0       |  |
| 381          |                          | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             |             |             |             |             |                       |             |             | 237,0       |  |
| 382          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |                       |             |             | 287,0       |  |
| 383          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 306         | 403         | 306         | 306                   | 403         | 306         | 327,0       |  |
| 500          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 500         | 500         | 500         | 500                   | 500         | 500         | 346,0       |  |
| 384          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |                       |             |             | 346,0       |  |
| 385          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |                       |             |             | 208,0       |  |
| 386          | 600                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 406         | 203         | 106         | 406                   | 203         | 106         | 237,0       |  |
| 300          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 300         | 600         | 600         | 300                   | 600         | 600         | 251,0       |  |
| 387          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |                       |             |             | 251,0       |  |
| 388          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |                       |             |             | 242,0       |  |
| 389          | 600                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |                       |             |             |             |  |
|              | X                        | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 406         | 253         | 156         | 406                   | 253         | 156         | 275,0       |  |
| 350          |                          |                                  |    |    |            |                                     |     |    |                               |             |             | 350         | 600         | 600         | 350                   | 600         | 600         | 292,0       |  |
| 390          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |                       |             |             | 292,0       |  |










SÄULENGESTELLE / DIE SETS

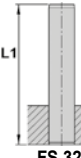
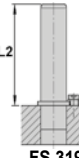



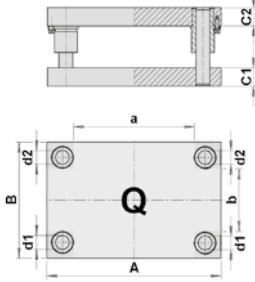
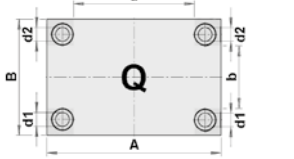
|   |                     |
|---|---------------------|
| <b>Stahlbuchse, RM-beschichtet</b><br>Leader pin bushing, RM plated           |                     |
| C1: FS 440 RM   | C1: FS 450 RM       |
| C3: FS 430 RM   | C3: FS 430 RM       |
| 182   | 183                 |
| <b>Stahlbuchse mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |                     |
| C1: FS 651  | C1: FS 655          |
| C3: FS 631  | C3: FS 631          |
| 172   | 173                 |
| <b>Stahlbuchse mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425   | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425   | C3: FS 457 + FS 425 |
| 192   | 193                 |

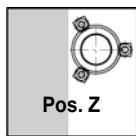
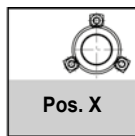


| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |    | Arbeitsflächen / Working area |             |             |             |             |             |             |             |             | Gewicht / Weight [kg] |     |     |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-----|-----|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |    | 182<br>172                    |             |             | 183<br>173  |             |             | 192<br>193  |             |             |                       |     |     |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3 | a<br>X<br>B                   | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |                       |     |     |       |
| 391          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 276,0 |
| 392          | 600<br>X<br>400          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 406         | 303         | 206         | 406         | 303         | 206         | 406                   | 303 | 206 | 314,0 |
| 393          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 333,0 |
| 394          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 344,0 |
| 395          | 600<br>X<br>500          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 406         | 403         | 306         | 406         | 403         | 306         | 406                   | 403 | 306 | 391,0 |
| 396          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 415,0 |
| 397          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 412,0 |
| 398          | 600<br>X<br>600          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 406         | 503         | 406         | 406         | 503         | 406         | 406                   | 503 | 406 | 468,0 |
| 399          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 497,0 |
| 400          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 282,0 |
| 401          | 700<br>X<br>350          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 506         | 253         | 156         | 506         | 253         | 156         | 506                   | 253 | 156 | 320,0 |
| 402          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 340,0 |
| 403          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 321,0 |
| 404          | 700<br>X<br>400          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 506         | 303         | 206         | 506         | 303         | 206         | 506                   | 303 | 206 | 365,0 |
| 405          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 387,0 |
| 406          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 400,0 |
| 407          | 700<br>X<br>500          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 506         | 403         | 306         | 506         | 403         | 306         | 506                   | 403 | 306 | 455,0 |
| 408          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 483,0 |
| 409          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 480,0 |
| 410          | 700<br>X<br>600          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 506         | 503         | 406         | 506         | 503         | 406         | 506                   | 503 | 406 | 545,0 |
| 411          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 579,0 |
| 412          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 366,0 |
| 413          | 800<br>X<br>400          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 606         | 303         | 206         | 606         | 303         | 206         | 606                   | 303 | 206 | 417,0 |
| 414          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 442,0 |
| 415          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 457,0 |
| 416          | 800<br>X<br>500          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 606         | 403         | 306         | 606         | 403         | 306         | 606                   | 403 | 306 | 520,0 |
| 417          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 551,0 |
| 418          |                          | 58                               | 48 |    |            | 224                                 | 180 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 547,0 |
| 419          | 800<br>X<br>600          | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -  |                               |             |             | 606         | 503         | 406         | 606         | 503         | 406         | 606                   | 503 | 406 | 623,0 |
| 420          |                          | 68                               | 68 |    |            | 280                                 | 200 | -  |                               |             |             |             |             |             |             |             |             |                       |     |     | 661,0 |

| Buchsentyp / Type of bushing  |   |   |
|---|---|---|
| Stahlbuchse, RM-beschichtet<br>Leader pin bushing, RM plated                      |   |   |
|  |  |  |
| FS 330 RM   | FS 340 RM   | FS 350 RM   |
| 141   | 142   | 143   |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated            |   |   |
|  |  |  |
| FS 331  | FS 351  | FS 355  |
| 131   | 132   | 133   |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage                     |   |   |
|  |  |  |
| FS 353 + FS 325   | FS 357 + FS 325   | FS 358 + FS 325   |
| 151   | 152   | 153   |

| Säulentyp / Type of leader pin  |   |
|---|---|
| eingepresst<br>press-fitted   | Schnellwechselsäule mit Bund<br>Leader pin, with collar                             |
|  |  |
| FS 320  | FS 319  |
| IEP   | IER   |

| Gestelltyp / Type of die set  |
|---|
|  |
|  |
|  |

| Position der Haltestücke / Position of holding clamps                               |   |
|---|---|
|  |  |
| Pos. Z  | Pos. X  |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |    | Arbeitsflächen / Working area |             |             |                 |                 |             |                 |                 |  | Gewicht / Weight [kg] |               |               |               |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|----|-------------------------------|-------------|-------------|-----------------|-----------------|-------------|-----------------|-----------------|--|-----------------------|---------------|---------------|---------------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |    | 141<br>131                    |             |             | 142<br>132      |                 |             | 143<br>133      |                 |  |                       | 151<br>X<br>B | 152<br>X<br>A | 153<br>X<br>A |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3 | a<br>X<br>B                   | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B     | b<br>X<br>A     | c<br>X<br>A |                 |                 |  |                       |               |               |               |
| 301          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 7,8           |               |               |
| 302          | 125<br>X<br>125          | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -  |                               |             |             | 15<br>X<br>125  | 15<br>X<br>125  |             |                 |                 |  |                       | 8,4           |               |               |
| 303          |                          | 38                               | 28 | -  |            | 160                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 9,7           |               |               |
| 304          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 9,5           |               |               |
| 305          | 160<br>X<br>125          | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -  |                               |             |             | 50<br>X<br>125  | 15<br>X<br>160  |             | 50<br>X<br>125  |                 |  |                       | 10,4          |               |               |
| 306          |                          | 38                               | 28 | -  |            | 150                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 11,9          |               |               |
| 307          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 11,9          |               |               |
| 308          | 160<br>X<br>160          | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -  |                               |             |             | 50<br>X<br>160  | 50<br>X<br>160  |             | 50<br>X<br>160  | 50<br>X<br>160  |  |                       | 12,8          |               |               |
| 309          |                          | 38                               | 28 | -  |            | 160                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 14,8          |               |               |
| 310          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 11,5          |               |               |
| 311          | 200<br>X<br>125          | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -  |                               |             |             | 90<br>X<br>125  | 15<br>X<br>200  |             | 90<br>X<br>125  |                 |  |                       | 12,5          |               |               |
| 312          |                          | 38                               | 28 | -  |            | 160                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 14,5          |               |               |
| 313          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 14,3          |               |               |
| 314          | 200<br>X<br>160          | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -  |                               |             |             | 90<br>X<br>160  | 50<br>X<br>200  |             | 90<br>X<br>160  | 50<br>X<br>200  |  |                       | 15,6          |               |               |
| 315          |                          | 38                               | 28 | -  |            | 160                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 18,1          |               |               |
| 316          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 17,5          |               |               |
| 317          | 200<br>X<br>200          | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -  |                               |             |             | 90<br>X<br>200  | 90<br>X<br>200  |             | 90<br>X<br>200  | 90<br>X<br>200  |  |                       | 19,1          |               |               |
| 318          |                          | 38                               | 28 | -  |            | 160                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 22,3          |               |               |
| 319          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 14,0          |               |               |
| 320          | 250<br>X<br>125          | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -  |                               |             |             | 140<br>X<br>125 | 15<br>X<br>250  |             | 140<br>X<br>125 |                 |  |                       | 15,3          |               |               |
| 321          |                          | 38                               | 28 | -  |            | 160                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 17,7          |               |               |
| 322          |                          | 28                               | 23 | -  |            | 125                                 | 100 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 17,5          |               |               |
| 323          | 250<br>X<br>160          | 28                               | 28 | -  | 19/20      | 140                                 | 112 | -  |                               |             |             | 140<br>X<br>160 | 50<br>X<br>250  |             | 140<br>X<br>160 | 50<br>X<br>250  |  |                       | 19,1          |               |               |
| 324          |                          | 38                               | 28 | -  |            | 160                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 22,3          |               |               |
| 325          |                          | 33                               | 28 | -  |            | 160                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 26,0          |               |               |
| 326          | 250<br>X<br>200          | 33                               | 33 | -  | 24/25      | 160                                 | 125 | -  |                               |             |             | 122<br>X<br>200 | 72<br>X<br>250  |             | 122<br>X<br>200 | 70<br>X<br>250  |  |                       | 27,9          |               |               |
| 327          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 35,8          |               |               |
| 328          |                          | 33                               | 28 | -  |            | 160                                 | 112 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 32,0          |               |               |
| 329          | 250<br>X<br>250          | 33                               | 33 | -  | 24/25      | 160                                 | 125 | -  |                               |             |             | 122<br>X<br>250 | 122<br>X<br>250 |             | 122<br>X<br>250 | 120<br>X<br>250 |  |                       | 34,4          |               |               |
| 330          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |                 |                 |             |                 |                 |  |                       | 44,2          |               |               |










| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Stahlbuchse, RM-beschichtet<br>Leader pin bushing, RM plated           |                 |                 |
|  |                 |                 |
| FS 330 RM  | FS 340 RM       | FS 350 RM       |
| 141  | 142             | 143             |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 331   | FS 351          | FS 355          |
| 131  | 132             | 133             |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 353 + FS 325  | FS 357 + FS 325 | FS 358 + FS 325 |
| 151  | 152             | 153             |

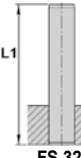
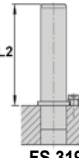
| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 320                         | FS 319  |
| IEP                            | IER   |


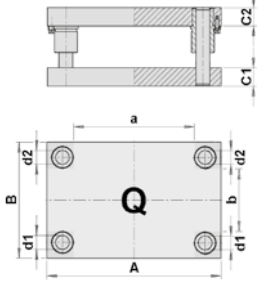
| Gestelltyp / Type of die set |
|------------------------------|
|                              |
|                              |

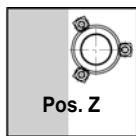
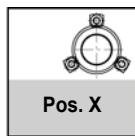
| Position der Haltestücke / Position of holding clamps |
|---|
|   |
|   |

| Größe / Size | Abmessungen / Dimensions |                               |    |    |            |                                  | Arbeitsflächen / Working area |    |             |             |             |             |             |             |             | Gewicht / Weight [kg] |             |             |             |             |             |  |      |  |
|--------------|--------------------------|-------------------------------|----|----|------------|----------------------------------|-------------------------------|----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------|-------------|-------------|-------------|--|------|--|
|              | A<br>X<br>B              | Plattenstärke Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge Length of leader pin |                               |    | 141<br>131  |             |             | 142<br>132  |             |             | 143<br>133  |                       |             | 151<br>152  |             |             | 153         |  |      |  |
|              |                          | C1                            | C2 | C3 |            | L1                               | L2                            | L3 | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B |                       | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |  |      |  |
| 331          |                          | 33                            | 28 | -  |            | 160                              | 112                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 25,0 |  |
| 332          | 300                      | 33                            | 33 | -  | 24/25      | 160                              | 125                           | -  |             |             |             | 172         | 32          |             |             |                       | 172         | 32          |             |             |             |  | 26,9 |  |
| 333          | 160                      | 48                            | 38 | -  |            | 180                              | 140                           | -  |             |             |             | 160         | 300         |             |             |                       | 160         | 300         |             |             |             |  | 34,4 |  |
| 334          |                          | 33                            | 28 | -  |            | 160                              | 112                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 30,8 |  |
| 335          | 300                      | 33                            | 33 | -  | 24/25      | 160                              | 125                           | -  |             |             |             | 172         | 72          |             |             |                       | 172         | 72          |             |             |             |  | 33,1 |  |
| 336          | 200                      | 48                            | 38 | -  |            | 180                              | 140                           | -  |             |             |             | 200         | 300         |             |             |                       | 200         | 300         |             |             |             |  | 42,5 |  |
| 337          |                          | 38                            | 33 | -  |            | 160                              | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 44,8 |  |
| 338          | 300                      | 38                            | 38 | -  | 30/32      | 180                              | 140                           | -  |             |             |             | 156         | 106         |             |             |                       | 156         | 106         |             |             |             |  | 47,8 |  |
| 339          | 250                      | 48                            | 38 | -  |            | 180                              | 140                           | -  |             |             |             | 250         | 300         |             |             |                       | 250         | 300         |             |             |             |  | 54,0 |  |
| 340          |                          | 38                            | 33 | -  |            | 160                              | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 53,5 |  |
| 341          | 300                      | 38                            | 38 | -  | 30/32      | 180                              | 140                           | -  |             |             |             | 156         | 156         |             |             |                       | 156         | 156         |             |             |             |  | 57,0 |  |
| 342          | 300                      | 48                            | 38 | -  |            | 180                              | 130                           | -  |             |             |             | 300         | 300         |             |             |                       | 300         | 300         |             |             |             |  | 64,0 |  |
| 343          |                          | 33                            | 28 | -  |            | 160                              | 112                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 35,6 |  |
| 344          | 350                      | 33                            | 33 | -  | 24/25      | 160                              | 125                           | -  |             |             |             | 222         | 72          |             |             |                       | 222         | 72          |             |             |             |  | 38,3 |  |
| 345          | 200                      | 48                            | 38 | -  |            | 180                              | 140                           | -  |             |             |             | 200         | 350         |             |             |                       | 200         | 350         |             |             |             |  | 49,3 |  |
| 346          |                          | 38                            | 33 | -  |            | 160                              | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 52,5 |  |
| 347          | 350                      | 38                            | 38 | -  | 30/32      | 180                              | 140                           | -  |             |             |             | 206         | 106         |             |             |                       | 206         | 106         |             |             |             |  | 55,5 |  |
| 348          | 250                      | 48                            | 38 | -  |            | 180                              | 140                           | -  |             |             |             | 250         | 350         |             |             |                       | 250         | 350         |             |             |             |  | 62,0 |  |
| 349          |                          | 38                            | 33 | -  |            | 160                              | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 61,5 |  |
| 350          | 350                      | 38                            | 38 | -  | 30/32      | 180                              | 140                           | -  |             |             |             | 206         | 206         |             |             |                       | 206         | 206         |             |             |             |  | 66,0 |  |
| 351          | 300                      | 48                            | 38 | -  |            | 180                              | 140                           | -  |             |             |             | 300         | 350         |             |             |                       | 300         | 350         |             |             |             |  | 74,0 |  |
| 352          |                          | 38                            | 33 | -  |            | 160                              | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 71,5 |  |
| 353          | 350                      | 38                            | 38 | -  | 30/32      | 180                              | 140                           | -  |             |             |             | 206         | 206         |             |             |                       | 206         | 206         |             |             |             |  | 76,5 |  |
| 354          | 350                      | 48                            | 38 | -  |            | 180                              | 140                           | -  |             |             |             | 350         | 350         |             |             |                       | 350         | 350         |             |             |             |  | 86,0 |  |
| 355          |                          | 33                            | 28 | -  |            | 160                              | 112                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 40,4 |  |
| 356          | 400                      | 33                            | 33 | -  | 24/25      | 160                              | 125                           | -  |             |             |             | 272         | 72          |             |             |                       | 272         | 72          |             |             |             |  | 43,5 |  |
| 357          | 200                      | 48                            | 38 | -  |            | 180                              | 140                           | -  |             |             |             | 200         | 400         |             |             |                       | 200         | 400         |             |             |             |  | 56,0 |  |
| 358          |                          | 38                            | 33 | -  |            | 160                              | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |             |             |             |  | 59,0 |  |
| 359          | 400                      | 38                            | 38 | -  | 30/32      | 180                              | 140                           | -  |             |             |             | 256         | 106         |             |             |                       | 256         | 106         |             |             |             |  | 63,0 |  |
| 360          | 250                      | 48                            | 38 | -  |            | 180                              | 140                           | -  |             |             |             | 250         | 400         |             |             |                       | 250         | 400         |             |             |             |  | 70,5 |  |

| Buchsentyp / Type of bushing  |   |   |
|---|---|---|
| Stahlbuchse, RM-beschichtet<br>Leader pin bushing, RM plated                      |   |   |
|  |  |  |
| FS 330 RM   | FS 340 RM   | FS 350 RM   |
| 141   | 142   | 143   |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated            |   |   |
|  |  |  |
| FS 331  | FS 351  | FS 355  |
| 131   | 132   | 133   |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage                     |   |   |
|  |  |  |
| FS 353 + FS 325   | FS 357 + FS 325   | FS 358 + FS 325   |
| 151   | 152   | 153   |

| Säulentyp / Type of leader pin  |   |
|---|---|
| eingepresst<br>press-fitted   | Schnellwechselsäule mit Bund<br>Leader pin, with collar                             |
|  |  |
| FS 320  | FS 319  |
| IEP   | IER   |

| Gestelltyp / Type of die set  |
|---|
|  |
|  |

| Position der Haltestücke / Position of holding clamps                               |   |
|---|---|
|  |  |
| Pos. Z  | Pos. X  |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |    | Arbeitsflächen / Working area |             |             |             |             |             |             |             |             | Gewicht / Weight [kg] |                   |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |    | 141<br>131                    |             |             | 142<br>132  |             |             | 143<br>133  |             |             |                       | 151<br>152<br>153 |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3 | a<br>X<br>B                   | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |                       |                   |
| 361          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 87,0              |
| 362          | 400                      | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 96,5              |
|              | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 232         | 132         |             |             |             |             |                       |                   |
|              | 300                      |                                  |    |    |            |                                     |     |    |                               |             |             | 300         | 400         |             |             |             |             |                       |                   |
| 363          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 106,0             |
| 364          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 101,0             |
| 365          | 400                      | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 112,0             |
|              | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 232         | 182         |             |             |             |             |                       |                   |
|              | 350                      |                                  |    |    |            |                                     |     |    |                               |             |             | 350         | 400         |             |             |             |             |                       |                   |
| 366          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 123,0             |
| 367          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 114,0             |
| 368          | 400                      | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 127,0             |
|              | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 232         | 232         |             |             |             |             |                       |                   |
|              | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             | 400         | 400         |             |             |             |             |                       |                   |
| 369          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 140,0             |
| 370          |                          | 38                               | 33 | -  |            | 160                                 | 125 | -  |                               |             |             |             |             |             |             |             |             |                       | 73,0              |
| 371          | 500                      | 38                               | 33 | -  |            | 160                                 | 125 | -  |                               |             |             |             |             |             |             |             |             |                       | 78,0              |
|              | X                        | 38                               | 38 | -  | 30/32      | 180                                 | 140 | -  |                               |             |             | 356         | 106         |             |             |             |             |                       |                   |
|              | 250                      |                                  |    |    |            |                                     |     |    |                               |             |             | 250         | 500         |             |             |             |             |                       |                   |
| 372          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 87,5              |
| 373          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 108,0             |
| 374          | 500                      | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 119,0             |
|              | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 332         | 132         |             |             |             |             |                       |                   |
|              | 300                      |                                  |    |    |            |                                     |     |    |                               |             |             | 300         | 500         |             |             |             |             |                       |                   |
| 375          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 131,0             |
| 376          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 125,0             |
| 377          | 500                      | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 138,0             |
|              | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 332         | 182         |             |             |             |             |                       |                   |
|              | 350                      |                                  |    |    |            |                                     |     |    |                               |             |             | 350         | 500         |             |             |             |             |                       |                   |
| 378          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 152,0             |
| 379          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 141,0             |
| 380          | 500                      | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 157,0             |
|              | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 332         | 232         |             |             |             |             |                       |                   |
|              | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             | 400         | 500         |             |             |             |             |                       |                   |
| 381          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 173,0             |
| 382          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 175,0             |
| 383          | 500                      | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 195,0             |
|              | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 332         | 332         |             |             |             |             |                       |                   |
|              | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             | 500         | 500         |             |             |             |             |                       |                   |
| 384          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 214,0             |
| 385          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 128,0             |
| 386          | 600                      | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 142,0             |
|              | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 432         | 132         |             |             |             |             |                       |                   |
|              | 300                      |                                  |    |    |            |                                     |     |    |                               |             |             | 300         | 600         |             |             |             |             |                       |                   |
| 387          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 156,0             |
| 388          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 148,0             |
| 389          | 600                      | 48                               | 38 | -  |            | 180                                 | 140 | -  |                               |             |             |             |             |             |             |             |             |                       | 165,0             |
|              | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -  |                               |             |             | 432         | 182         |             |             |             |             |                       |                   |
|              | 350                      |                                  |    |    |            |                                     |     |    |                               |             |             | 350         | 600         |             |             |             |             |                       |                   |
| 390          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -  |                               |             |             |             |             |             |             |             |             |                       | 181,0             |

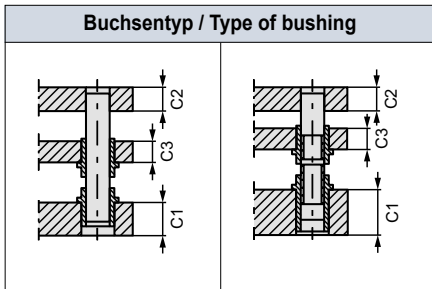
| Buchsentyp / Type of bushing   |                 |                 |
|--|-----------------|-----------------|
| Stahlbuchse, RM-beschichtet<br>Leader pin bushing, RM plated           |                 |                 |
|  |                 |                 |
| FS 330 RM  | FS 340 RM       | FS 350 RM       |
| 141  | 142             | 143             |
| Stahlbuchse mit Bronzeplattierung<br>Leader pin bushing, bronze plated |                 |                 |
|  |                 |                 |
| FS 331   | FS 351          | FS 355          |
| 131  | 132             | 133             |
| Stahlbuchse mit Ms-Käfig<br>Leader pin bushing with ball cage          |                 |                 |
|  |                 |                 |
| FS 353 + FS 325  | FS 357 + FS 325 | FS 358 + FS 325 |
| 151  | 152             | 153             |

| Säulentyp / Type of leader pin |   |
|--------------------------------|---|
| eingepresst<br>press-fitted    | Schnellwechselsäule mit Bund<br>Leader pin, with collar |
|                                |   |
| FS 320                         | FS 319  |
| IEP                            | IER   |

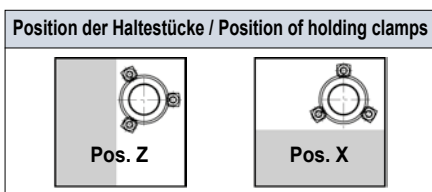
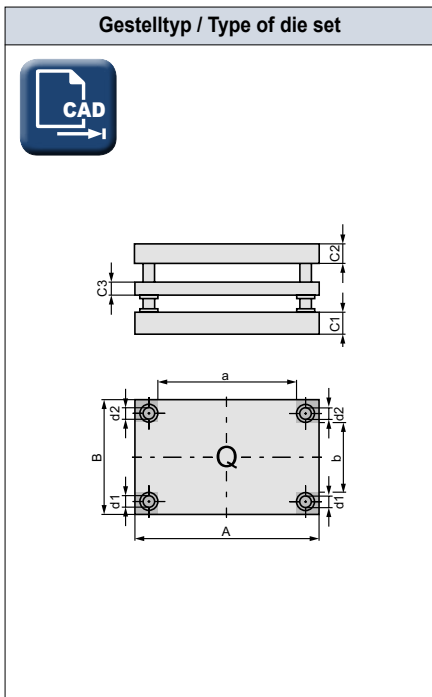
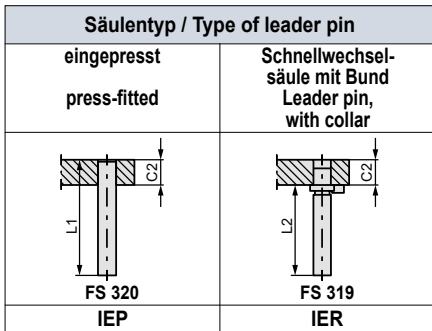
| Gestelltyp / Type of die set |  |
|------------------------------|--|
|                              |  |

| Position der Haltestücke / Position of holding clamps |        |
|---|--------|
|   |        |
| Pos. Z  | Pos. X |

| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |             |             |             |             |             | Gewicht / Weight [kg] |             |     |     |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------|-----|-----|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 141<br>131  |             |             | 142<br>132  |             |             | 143<br>133  |             |                       | 151         | 152 | 153 |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A |                       | c<br>X<br>A |     |     |       |
| 391          |                          | 48                               | 38 | -  |            | 180                                 | 140 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 168,0 |
| 392          | 600                      | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -                             |             |             |             |             | 432         | 232         |             |             | 432                   | 232         |     |     | 187,0 |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | 400         | 600         |             |             | 400                   | 600         |     |     | 206,0 |
| 393          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     |       |
| 394          | 600                      | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 259,0 |
| 395          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             | 406         | 306         |             |             | 406                   | 306         |     |     | 283,0 |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
| 396          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -                             |             |             |             |             | 500         | 600         |             |             | 500                   | 600         |     |     | 306,0 |
| 397          | 600                      | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 309,0 |
| 398          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             | 406         | 406         |             |             | 406                   | 406         |     |     | 337,0 |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
| 399          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -                             |             |             |             |             | 600         | 600         |             |             | 600                   | 600         |     |     | 365,0 |
| 400          | 700                      | 48                               | 38 | -  |            | 180                                 | 140 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 172,0 |
| 401          | X                        | 48                               | 48 | -  | 38/40      | 200                                 | 160 | -                             |             |             |             |             | 532         | 182         |             |             | 532                   | 182         |     |     | 191,0 |
|              | 350                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
| 402          |                          | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             | 350         | 700         |             |             | 350                   | 700         |     |     | 210,0 |
| 403          | 700                      | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 242,0 |
| 404          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             | 506         | 206         |             |             | 506                   | 206         |     |     | 264,0 |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
| 405          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -                             |             |             |             |             | 400         | 700         |             |             | 400                   | 700         |     |     | 286,0 |
| 406          | 700                      | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 300,0 |
| 407          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             | 506         | 306         |             |             | 506                   | 306         |     |     | 328,0 |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
| 408          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -                             |             |             |             |             | 500         | 700         |             |             | 500                   | 700         |     |     | 356,0 |
| 409          | 700                      | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 359,0 |
| 410          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             | 506         | 406         |             |             | 506                   | 406         |     |     | 392,0 |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
| 411          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -                             |             |             |             |             | 600         | 700         |             |             | 600                   | 700         |     |     | 425,0 |
| 412          | 800                      | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 276,0 |
| 413          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             | 606         | 206         |             |             | 606                   | 206         |     |     | 301,0 |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
| 414          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -                             |             |             |             |             | 400         | 800         |             |             | 400                   | 800         |     |     | 326,0 |
| 415          | 800                      | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 342,0 |
| 416          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             | 606         | 306         |             |             | 606                   | 306         |     |     | 374,0 |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
| 417          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -                             |             |             |             |             | 500         | 800         |             |             | 500                   | 800         |     |     | 405,0 |
| 418          | 800                      | 58                               | 48 | -  |            | 224                                 | 160 | -                             |             |             |             |             |             |             |             |             |                       |             |     |     | 409,0 |
| 419          | X                        | 58                               | 58 | -  | 48/50      | 250                                 | 180 | -                             |             |             |             |             | 606         | 406         |             |             | 606                   | 406         |     |     | 447,0 |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             |             | X           | X           |             |             | X                     | X           |     |     |       |
| 420          |                          | 68                               | 58 | -  |            | 250                                 | 180 | -                             |             |             |             |             | 600         | 800         |             |             | 600                   | 800         |     |     | 484,0 |



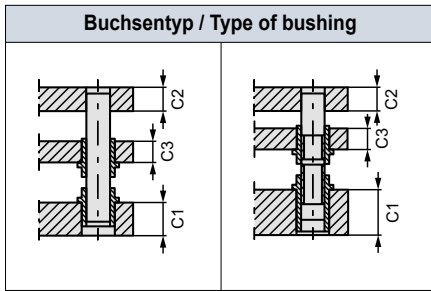
|   |                     |
|---|---------------------|
| <b>Stahlbuchse, RM-beschichtet</b><br>Leader pin bushing, RM plated           |                     |
| C1: FS 440 RM   | C1: FS 450 RM       |
| C3: FS 430 RM   | C3: FS 430 RM       |
| 182   | 183                 |
| <b>Stahlbuchse mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |                     |
| C1: FS 651  | C1: FS 655          |
| C3: FS 631  | C3: FS 631          |
| 172   | 173                 |
| <b>Stahlbuchse mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425   | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425   | C3: FS 457 + FS 425 |
| 192   | 193                 |



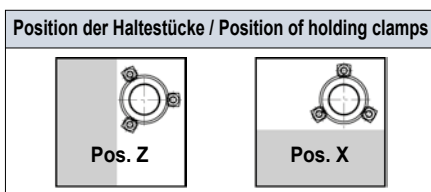
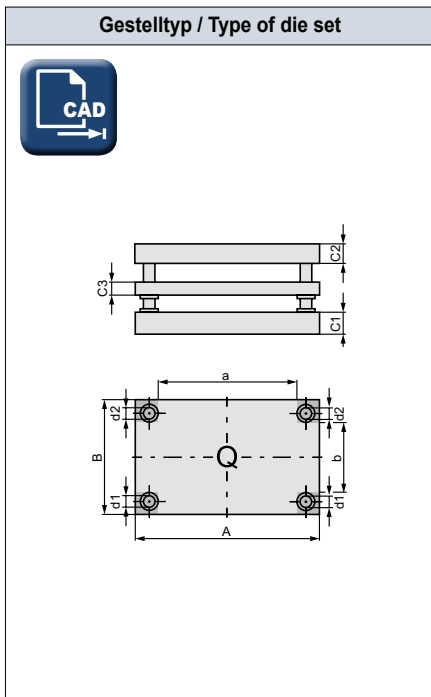
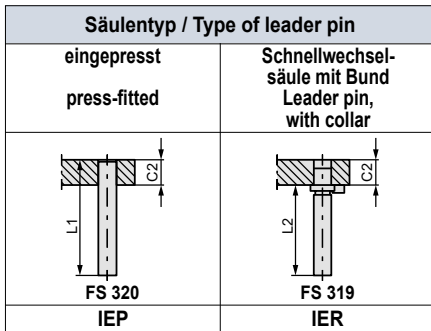
| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |     |             | Arbeitsflächen / Working area |             |             |             |             |             |             |             |     | Gewicht / Weight [kg] |  |      |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-----|-------------|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----|-----------------------|--|------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |     |             |                               |             | 182<br>172  |             | 183<br>173  |             | 192<br>193  |             |     |                       |  |      |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3  | a<br>X<br>B | b<br>X<br>A                   | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |     |                       |  |      |
| 301          |                          | 28                               | 23 |    |            | 140                                 | 125 | -   |             |                               |             |             |             |             |             |             |             |     |                       |  | 10,0 |
| 302          | 125                      | X                                | 38 | 28 | 23         | 19/20                               | 160 | 140 | -           |                               |             |             | 15          | 15          |             |             | 15          | 15  |                       |  | 11,8 |
|              | 125                      |                                  | 38 | 28 |            |                                     | 160 | 140 | -           |                               |             |             | 125         | 125         |             |             | 125         | 125 |                       |  | 13,1 |
| 303          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |
| 304          |                          | 160                              | 28 | 23 |            |                                     | 140 | 125 | -           |                               |             |             |             |             |             |             |             |     |                       |  | 12,4 |
| 305          | X                        | 125                              | 38 | 28 | 23         | 19/20                               | 160 | 140 | -           |                               |             |             | 50          | 15          |             |             | 50          | 15  |                       |  | 14,2 |
|              |                          |                                  | 38 | 28 |            |                                     | 160 | 140 | -           |                               |             |             | 125         | 160         |             |             | 125         | 160 |                       |  | 16,3 |
| 306          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |
| 307          |                          | 160                              | 28 | 23 |            |                                     | 140 | 125 | -           |                               |             |             |             |             |             |             |             |     |                       |  | 15,4 |
| 308          | X                        | 160                              | 38 | 28 | 23         | 19/20                               | 160 | 140 | -           |                               |             |             | 50          | 50          |             |             | 50          | 50  |                       |  | 18,4 |
|              |                          |                                  | 38 | 28 |            |                                     | 160 | 140 | -           |                               |             |             | 160         | 160         |             |             | 160         | 160 |                       |  | 20,4 |
| 309          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |
| 310          |                          | 200                              | 28 | 23 |            |                                     | 140 | 125 | -           |                               |             |             |             |             |             |             |             |     |                       |  | 15,1 |
| 311          | X                        | 125                              | 38 | 28 | 23         | 19/20                               | 160 | 140 | -           |                               |             |             | 90          | 15          |             |             | 90          | 15  |                       |  | 18,0 |
|              |                          |                                  | 38 | 28 |            |                                     | 160 | 140 | -           |                               |             |             | 125         | 200         |             |             | 125         | 200 |                       |  | 20,0 |
| 312          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |
| 313          |                          | 200                              | 28 | 23 |            |                                     | 140 | 125 | -           |                               |             |             |             |             |             |             |             |     |                       |  | 18,9 |
| 314          | X                        | 160                              | 38 | 28 | 23         | 19/20                               | 160 | 140 | -           |                               |             |             | 90          | 50          |             |             | 90          | 50  |                       |  | 22,6 |
|              |                          |                                  | 38 | 28 |            |                                     | 160 | 140 | -           |                               |             |             | 160         | 200         |             |             | 160         | 200 |                       |  | 25,2 |
| 315          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |
| 316          |                          | 200                              | 28 | 23 |            |                                     | 140 | 125 | -           |                               |             |             |             |             |             |             |             |     |                       |  | 23,2 |
| 317          | X                        | 200                              | 38 | 28 | 23         | 19/20                               | 160 | 140 | -           |                               |             |             | 90          | 90          |             |             | 90          | 90  |                       |  | 27,9 |
|              |                          |                                  | 38 | 28 |            |                                     | 160 | 140 | -           |                               |             |             | 200         | 200         |             |             | 200         | 200 |                       |  | 31,1 |
| 318          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |
| 319          |                          | 250                              | 28 | 23 |            |                                     | 140 | 125 | -           |                               |             |             |             |             |             |             |             |     |                       |  | 18,5 |
| 320          | X                        | 125                              | 38 | 28 | 23         | 19/20                               | 160 | 140 | -           |                               |             |             | 140         | 15          |             |             | 140         | 15  |                       |  | 22,1 |
|              |                          |                                  | 38 | 28 |            |                                     | 160 | 140 | -           |                               |             |             | 125         | 250         |             |             | 125         | 250 |                       |  | 24,6 |
| 321          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |
| 322          |                          | 250                              | 28 | 23 |            |                                     | 140 | 125 | -           |                               |             |             |             |             |             |             |             |     |                       |  | 23,2 |
| 323          | X                        | 160                              | 38 | 28 | 23         | 19/20                               | 160 | 140 | -           |                               |             |             | 140         | 50          |             |             | 140         | 50  |                       |  | 27,9 |
|              |                          |                                  | 38 | 28 |            |                                     | 160 | 140 | -           |                               |             |             | 160         | 250         |             |             | 160         | 250 |                       |  | 31,1 |
| 324          |                          |                                  | 38 | 38 |            |                                     | 180 | 140 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |
| 325          |                          | 250                              | 33 | 28 |            |                                     | 160 | 125 | -           |                               |             |             |             |             |             |             |             |     |                       |  | 35,0 |
| 326          | X                        | 200                              | 48 | 38 | 23         | 24/25                               | 180 | 160 | -           |                               |             |             | 122         | 72          |             |             | 122         | 72  |                       |  | 44,8 |
|              |                          |                                  | 48 | 38 |            |                                     | 180 | 160 | -           |                               |             |             | 200         | 250         |             |             | 200         | 250 |                       |  | 48,7 |
| 327          |                          |                                  | 48 | 48 |            |                                     | 200 | 160 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |
| 328          |                          | 250                              | 33 | 28 |            |                                     | 160 | 125 | -           |                               |             |             |             |             |             |             |             |     |                       |  | 43,2 |
| 329          | X                        | 250                              | 48 | 38 | 23         | 24/25                               | 180 | 160 | -           |                               |             |             | 122         | 122         |             |             | 122         | 122 |                       |  | 55,5 |
|              |                          |                                  | 48 | 38 |            |                                     | 180 | 160 | -           |                               |             |             | 250         | 250         |             |             | 250         | 250 |                       |  | 60,5 |
| 330          |                          |                                  | 48 | 48 |            |                                     | 200 | 160 | -           |                               |             |             |             |             |             |             |             |     |                       |  |      |



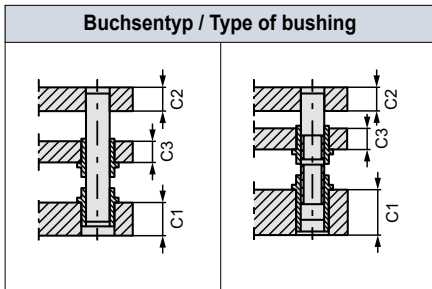
SÄULENGESTELLE / DIE SETS



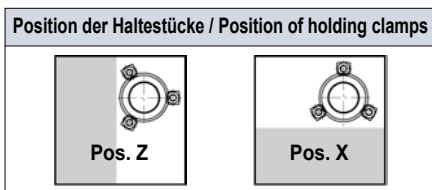
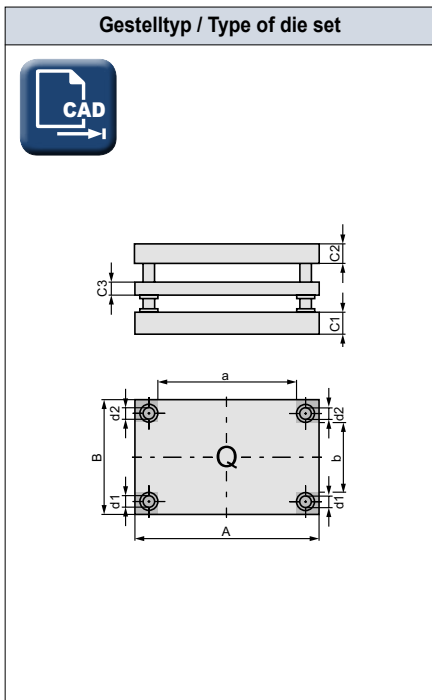
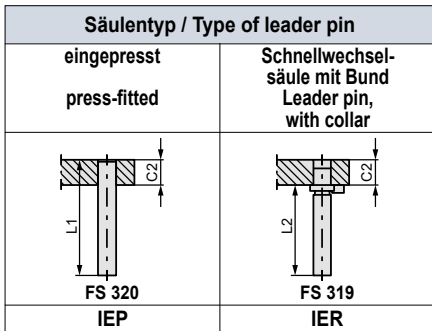
|   |                     |
|---|---------------------|
| <b>Stahlbuchse, RM-beschichtet</b><br>Leader pin bushing, RM plated           |                     |
| C1: FS 440 RM   | C1: FS 450 RM       |
| C3: FS 430 RM   | C3: FS 430 RM       |
| 182   | 183                 |
| <b>Stahlbuchse mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |                     |
| C1: FS 651  | C1: FS 655          |
| C3: FS 631  | C3: FS 631          |
| 172   | 173                 |
| <b>Stahlbuchse mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425   | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425   | C3: FS 457 + FS 425 |
| 192   | 193                 |



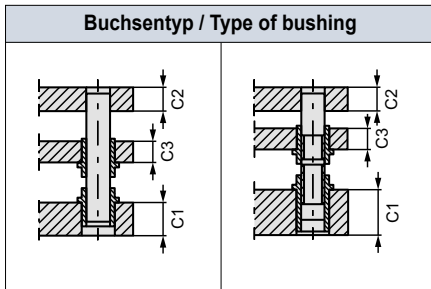
| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     | Arbeitsflächen / Working area |    |             |             |             |             |             |             |             | Gewicht / Weight [kg] |             |             |  |  |       |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-------------------------------|----|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-----------------------|-------------|-------------|--|--|-------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |                               |    | 182<br>172  |             |             | 183<br>173  |             |             | 192<br>193  |                       |             |             |  |  |       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2                            | L3 | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B |                       | b<br>X<br>A | c<br>X<br>A |  |  |       |
| 331          |                          | 33                               | 28 |    |            | 160                                 | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 33,7  |
| 332          | 300                      | 48                               | 38 | 23 | 24/25      | 180                                 | 140                           | -  |             |             |             | 172         | 32          |             |             |                       | 172         | 32          |  |  | 43,1  |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 160          |                          | 48                               | 48 |    |            | 200                                 | 140                           | -  |             |             |             | 160         | 300         |             |             |                       | 160         | 300         |  |  | 46,9  |
| 333          |                          | 48                               | 48 |    |            | 200                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |
| 334          |                          | 33                               | 28 |    |            | 160                                 | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 41,6  |
| 335          | 300                      | 48                               | 38 | 23 | 24/25      | 180                                 | 140                           | -  |             |             |             | 172         | 72          |             |             |                       | 172         | 72          |  |  | 53,5  |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 200          |                          | 48                               | 48 |    |            | 200                                 | 140                           | -  |             |             |             | 200         | 300         |             |             |                       | 200         | 300         |  |  | 58,5  |
| 336          |                          | 48                               | 48 |    |            | 200                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |
| 337          |                          | 38                               | 33 |    |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 61,5  |
| 338          | 300                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 156         | 106         |             |             |                       | 152         | 106         |  |  | 70,5  |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 250          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             | 250         | 300         |             |             |                       | 250         | 300         |  |  | 76,0  |
| 339          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |
| 340          |                          | 38                               | 33 |    |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 73,0  |
| 341          | 300                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 156         | 156         |             |             |                       | 156         | 156         |  |  | 83,5  |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 300          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             | 300         | 300         |             |             |                       | 300         | 300         |  |  | 90,5  |
| 342          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |
| 343          |                          | 33                               | 28 |    |            | 160                                 | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 48,2  |
| 344          | 350                      | 48                               | 38 | 23 | 24/25      | 180                                 | 160                           | -  |             |             |             | 222         | 72          |             |             |                       | 222         | 72          |  |  | 62,0  |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 200          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             | 200         | 350         |             |             |                       | 200         | 350         |  |  | 67,5  |
| 345          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |
| 346          |                          | 38                               | 33 |    |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 71,0  |
| 347          | 350                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 206         | 106         |             |             |                       | 206         | 106         |  |  | 81,5  |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 250          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             | 250         | 350         |             |             |                       | 250         | 350         |  |  | 88,5  |
| 348          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |
| 349          |                          | 38                               | 33 |    |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 85,0  |
| 350          | 350                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 206         | 156         |             |             |                       | 206         | 156         |  |  | 97,0  |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 300          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             | 300         | 350         |             |             |                       | 300         | 350         |  |  | 105,0 |
| 351          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |
| 352          |                          | 38                               | 33 |    |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 98,5  |
| 353          | 350                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 206         | 206         |             |             |                       | 206         | 206         |  |  | 113,0 |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 350          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             | 350         | 350         |             |             |                       | 350         | 350         |  |  | 123,0 |
| 354          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |
| 355          |                          | 33                               | 28 |    |            | 160                                 | 125                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 55,0  |
| 356          | 400                      | 48                               | 38 | 23 | 24/25      | 180                                 | 140                           | -  |             |             |             | 272         | 72          |             |             |                       | 272         | 72          |  |  | 70,5  |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 200          |                          | 48                               | 48 |    |            | 200                                 | 140                           | -  |             |             |             | 200         | 400         |             |             |                       | 200         | 400         |  |  | 77,0  |
| 357          |                          | 48                               | 48 |    |            | 200                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |
| 358          |                          | 38                               | 33 |    |            | 180                                 | 140                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  | 81,0  |
| 359          | 400                      | 48                               | 38 | 33 | 30/32      | 200                                 | 160                           | -  |             |             |             | 256         | 106         |             |             |                       | 256         | 106         |  |  | 92,5  |
|              | X                        |                                  |    |    |            |                                     |                               |    |             |             |             | X           | X           |             |             |                       | X           | X           |  |  |       |
| 250          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             | 250         | 400         |             |             |                       | 250         | 400         |  |  | 101,0 |
| 360          |                          | 48                               | 48 |    |            | 200                                 | 160                           | -  |             |             |             |             |             |             |             |                       |             |             |  |  |       |



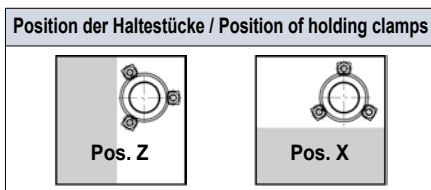
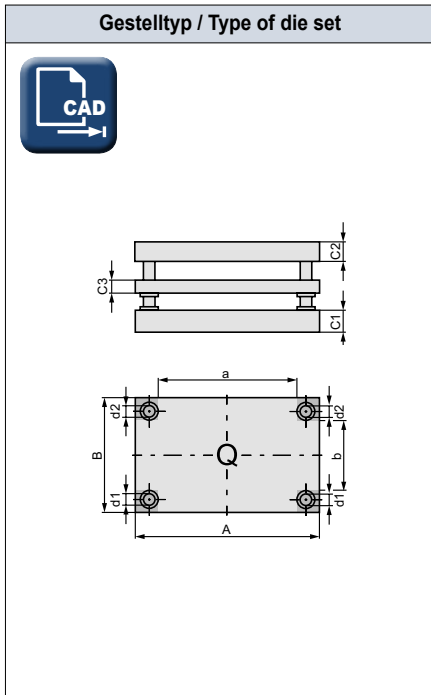
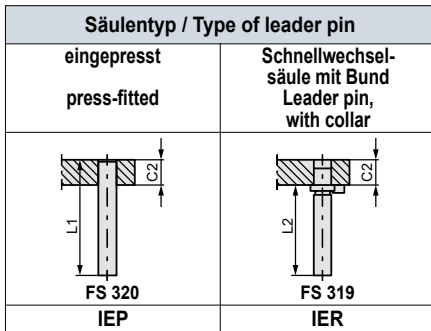
|   |                     |
|---|---------------------|
| <b>Stahlbuchse, RM-beschichtet</b><br>Leader pin bushing, RM plated           |                     |
| C1: FS 440 RM   | C1: FS 450 RM       |
| C3: FS 430 RM   | C3: FS 430 RM       |
| 182   | 183                 |
| <b>Stahlbuchse mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |                     |
| C1: FS 651  | C1: FS 655          |
| C3: FS 631  | C3: FS 631          |
| 172   | 173                 |
| <b>Stahlbuchse mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425   | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425   | C3: FS 457 + FS 425 |
| 192   | 193                 |



| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     |    | Arbeitsflächen / Working area |             |             |             |             |             |     |  | Gewicht / Weight [kg] |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-----|--|-----------------------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |    | 182<br>172                    |             |             | 183<br>173  |             | 192<br>193  |     |  |                       |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3 | a<br>X<br>B                   | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A |     |  |                       |
| 361          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |     |  | 118,0                 |
| 362          | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             | 232         | 132         |             | 232         | 132 |  | 137,0                 |
| 363          | 300                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             | 300         | 400         |             | 300         | 400 |  | 147,0                 |
| 364          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |     |  | 137,0                 |
| 365          | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             | 232         | 182         |             | 232         | 182 |  | 159,0                 |
| 366          | 350                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             | 350         | 400         |             | 350         | 400 |  | 170,0                 |
| 367          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |     |  | 156,0                 |
| 368          | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             | 232         | 232         |             | 232         | 232 |  | 181,0                 |
| 369          | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             | 400         | 400         |             | 400         | 400 |  | 194,0                 |
| 370          |                          | 38                               | 33 |    |            | 180                                 | 140 | -  |                               |             |             |             |             |             |     |  | 100,0                 |
| 371          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 48                               | 38 | 33 | 30/32      | 200                                 | 160 | -  |                               |             | 356         | 106         |             | 356         | 106 |  | 115,0                 |
| 372          | 250                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 48                               | 48 |    |            | 200                                 | 160 | -  |                               |             | 250         | 500         |             | 250         | 500 |  | 125,0                 |
| 373          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |     |  | 146,0                 |
| 374          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             | 332         | 132         |             | 332         | 132 |  | 170,0                 |
| 375          | 300                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             | 300         | 500         |             | 300         | 500 |  | 182,0                 |
| 376          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |     |  | 170,0                 |
| 377          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             | 332         | 182         |             | 332         | 182 |  | 197,0                 |
| 378          | 350                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             | 350         | 500         |             | 350         | 500 |  | 211,0                 |
| 379          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |     |  | 193,0                 |
| 380          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             | 332         | 232         |             | 332         | 232 |  | 225,0                 |
| 381          | 400                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             | 400         | 500         |             | 400         | 500 |  | 240,0                 |
| 382          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |     |  | 240,0                 |
| 383          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             | 332         | 332         |             | 332         | 332 |  | 279,0                 |
| 384          | 500                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             | 500         | 500         |             | 500         | 500 |  | 299,0                 |
| 385          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |     |  | 174,0                 |
| 386          | 600                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             | 432         | 132         |             | 432         | 132 |  | 203,0                 |
| 387          | 300                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             | 300         | 600         |             | 300         | 600 |  | 217,0                 |
| 388          |                          | 48                               | 38 |    |            | 200                                 | 160 | -  |                               |             |             |             |             |             |     |  | 202,0                 |
| 389          | 600                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -  |                               |             | 432         | 182         |             | 432         | 182 |  | 235,0                 |
| 390          | 350                      |                                  |    |    |            |                                     |     |    |                               |             |             |             |             |             |     |  |                       |
|              | X                        | 58                               | 58 |    |            | 250                                 | 180 | -  |                               |             | 350         | 600         |             | 350         | 600 |  | 252,0                 |



|   |                     |
|---|---------------------|
| <b>Stahlbuchse, RM-beschichtet</b><br>Leader pin bushing, RM plated           |                     |
| C1: FS 440 RM   | C1: FS 450 RM       |
| C3: FS 430 RM   | C3: FS 430 RM       |
| 182   | 183                 |
| <b>Stahlbuchse mit Bronzeplattierung</b><br>Leader pin bushing, bronze plated |                     |
| C1: FS 651  | C1: FS 655          |
| C3: FS 631  | C3: FS 631          |
| 172   | 173                 |
| <b>Stahlbuchse mit Ms-Käfig</b><br>Leader pin bushing with ball cage          |                     |
| C1: FS 458 + FS 425   | C1: FS 453 + FS 425 |
| C3: FS 457 + FS 425   | C3: FS 457 + FS 425 |
| 192   | 193                 |



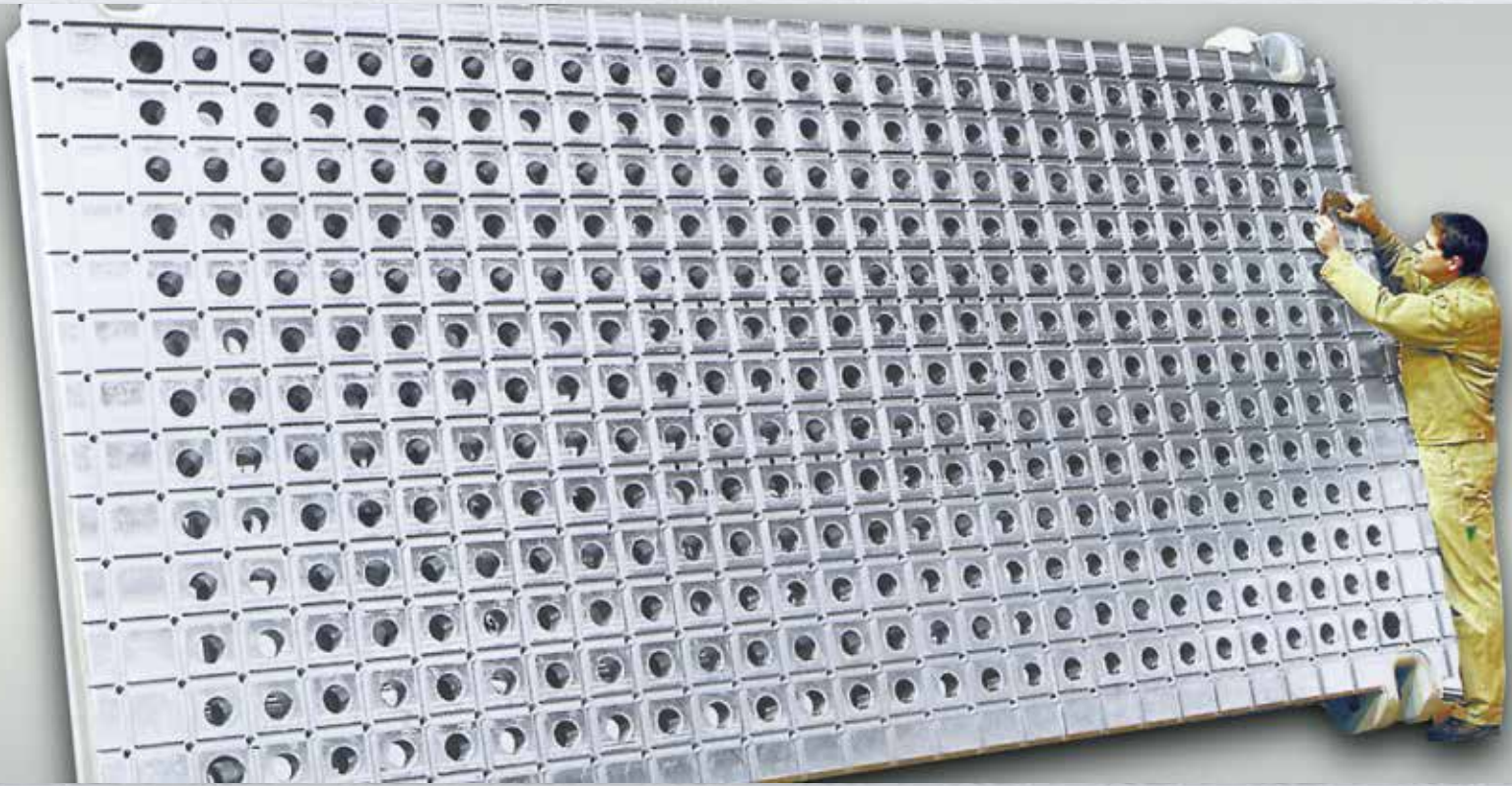
| Größe / Size | Abmessungen / Dimensions |                                  |    |    |            |                                     |     | Arbeitsflächen / Working area |             |             |             |             |             | Gewicht / Weight [kg] |               |               |             |
|--------------|--------------------------|----------------------------------|----|----|------------|-------------------------------------|-----|-------------------------------|-------------|-------------|-------------|-------------|-------------|-----------------------|---------------|---------------|-------------|
|              | A<br>X<br>B              | Plattenstärke<br>Plate thickness |    |    | Ø<br>d1/d2 | Säulenlänge<br>Length of leader pin |     |                               | 182<br>172  |             |             | 183<br>173  |             |                       | 192<br>X<br>B | 193<br>X<br>A |             |
|              |                          | C1                               | C2 | C3 |            | L1                                  | L2  | L3                            | a<br>X<br>B | b<br>X<br>A | c<br>X<br>A | a<br>X<br>B | b<br>X<br>A |                       |               |               | c<br>X<br>A |
| 391          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |                       |               |               | 230,0       |
| 392          | 600                      | 58                               | 48 | 38 | 38/40      | 224                                 | 180 | -                             |             |             |             | 432         | 232         |                       | 432           | 232           | 268,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             | 400         | 600         |                       | 400           | 600           | 287,0       |
| 393          |                          | 58                               | 58 |    |            | 250                                 | 180 | -                             |             |             |             |             |             |                       |               |               |             |
| 394          |                          | 58                               | 48 |    |            | 224                                 | 180 | -                             |             |             |             |             |             |                       |               |               | 348,0       |
| 395          | 600                      | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -                             |             |             |             | 406         | 306         |                       | 406           | 306           | 395,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             | 500         | 600         |                       | 500           | 600           | 419,0       |
| 396          |                          | 68                               | 68 |    |            | 280                                 | 200 | -                             |             |             |             |             |             |                       |               |               |             |
| 397          |                          | 58                               | 48 |    |            | 224                                 | 180 | -                             |             |             |             |             |             |                       |               |               | 416,0       |
| 398          | 600                      | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -                             |             |             |             | 406         | 406         |                       | 406           | 406           | 473,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             | 600         | 600         |                       | 600           | 600           | 501,0       |
| 399          |                          | 68                               | 68 |    |            | 280                                 | 200 | -                             |             |             |             |             |             |                       |               |               |             |
| 400          |                          | 48                               | 38 |    |            | 200                                 | 160 | -                             |             |             |             |             |             |                       |               |               | 235,0       |
| 401          | 700                      | 58                               | 48 | 48 | 38/40      | 224                                 | 180 | -                             |             |             |             | 532         | 182         |                       | 532           | 182           | 274,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 350                      |                                  |    |    |            |                                     |     |                               |             |             |             | 350         | 700         |                       | 350           | 700           | 293,0       |
| 402          |                          | 58                               | 58 |    |            | 250                                 | 180 | -                             |             |             |             |             |             |                       |               |               |             |
| 403          |                          | 58                               | 48 |    |            | 224                                 | 180 | -                             |             |             |             |             |             |                       |               |               | 326,0       |
| 404          | 700                      | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -                             |             |             |             | 506         | 206         |                       | 506           | 206           | 370,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             | 400         | 700         |                       | 400           | 700           | 392,0       |
| 405          |                          | 68                               | 68 |    |            | 280                                 | 200 | -                             |             |             |             |             |             |                       |               |               |             |
| 406          |                          | 58                               | 48 |    |            | 224                                 | 180 | -                             |             |             |             |             |             |                       |               |               | 405,0       |
| 407          | 700                      | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -                             |             |             |             | 506         | 306         |                       | 506           | 306           | 460,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             | 500         | 700         |                       | 500           | 700           | 487,0       |
| 408          |                          | 68                               | 68 |    |            | 280                                 | 200 | -                             |             |             |             |             |             |                       |               |               |             |
| 409          |                          | 58                               | 48 |    |            | 224                                 | 180 | -                             |             |             |             |             |             |                       |               |               | 484,0       |
| 410          | 700                      | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -                             |             |             |             | 506         | 406         |                       | 506           | 406           | 540,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             | 600         | 700         |                       | 600           | 700           | 583,0       |
| 411          |                          | 68                               | 68 |    |            | 280                                 | 200 | -                             |             |             |             |             |             |                       |               |               |             |
| 412          |                          | 58                               | 48 |    |            | 224                                 | 180 | -                             |             |             |             |             |             |                       |               |               | 371,0       |
| 413          | 800                      | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -                             |             |             |             | 606         | 206         |                       | 606           | 206           | 421,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 400                      |                                  |    |    |            |                                     |     |                               |             |             |             | 400         | 800         |                       | 400           | 800           | 447,0       |
| 414          |                          | 68                               | 68 |    |            | 280                                 | 200 | -                             |             |             |             |             |             |                       |               |               |             |
| 415          |                          | 58                               | 48 |    |            | 224                                 | 180 | -                             |             |             |             |             |             |                       |               |               | 461,0       |
| 416          | 800                      | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -                             |             |             |             | 606         | 306         |                       | 606           | 306           | 524,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 500                      |                                  |    |    |            |                                     |     |                               |             |             |             | 500         | 800         |                       | 500           | 800           | 556,0       |
| 417          |                          | 68                               | 68 |    |            | 280                                 | 200 | -                             |             |             |             |             |             |                       |               |               |             |
| 418          |                          | 58                               | 48 |    |            | 224                                 | 180 | -                             |             |             |             |             |             |                       |               |               | 552,0       |
| 419          | 800                      | 68                               | 58 | 48 | 48/50      | 250                                 | 200 | -                             |             |             |             | 606         | 406         |                       | 606           | 406           | 627,0       |
|              | X                        |                                  |    |    |            |                                     |     |                               |             |             |             | X           | X           |                       | X             | X             |             |
|              | 600                      |                                  |    |    |            |                                     |     |                               |             |             |             | 600         | 800         |                       | 600           | 800           | 665,0       |
| 420          |                          | 68                               | 68 |    |            | 280                                 | 200 | -                             |             |             |             |             |             |                       |               |               |             |





**MSP** **GN** **GM** **BH**

**Märkische Stanz-Partner**



## **[stanznormalien]**

Großstahlplatten und Stahl-Schweiß-Konstruktionen mit Sonderbearbeitungen

## **[standarddiecomponents]**

XXL - Steel plates and welded units  
with additional work / secondary operation





CNC - Brennschneiden  
CNC - flame cutting

Glühen  
Annealing

Stahlkies strahlen  
Steel shot blasting

Richten  
Flattening

Farbgebung - Grundierung  
Coloring - priming

CNC - Diskusschleifen  
CNC - rotary grinding

CNC - Feinschleifen  
CNC - finish grinding

Materiallager ST 52-3, Blechdicken 10 – 600 mm  
Stock ST 52-3, sheet thickness 10 – 600 mm

Abmessungen 6.000 x 3.000 x 2.000 mm, bis 25 t Stückgewicht  
Dimensions 6.000 x 3.000 x 2.000 mm, up to 25 t unit weight

Abmessungen 6.000 x 3.000 x 2.000 mm, bis 25 t Stückgewicht  
Dimensions 6.000 x 3.000 x 2.000 mm, up to 25 t unit weight

Abmessungen 6.000 x 3.000 x 2.000 mm, bis 25 t Stückgewicht  
Dimensions 6.000 x 3.000 x 2.000 mm, up to 25 t unit weight

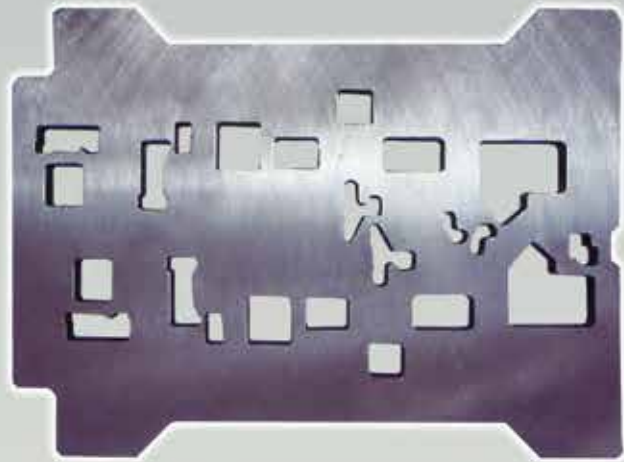
Abmessungen 6.000 x 3.000 x 2.000 mm, bis 25 t Stückgewicht  
Dimensions 6.000 x 3.000 x 2.000 mm, up to 25 t unit weight

Verfahrweg  
Travelling distance 4.000 x 1.250 x 300 mm

Verfahrweg  
Travelling distance 3.000 x 1.600 x 600 mm

**XXL - Steel plates and welded units**

SÄULENGESTELLE / DIE SETS



|   |   |                                 |
|---|---|---------------------------------|
| <b>CNC - Lehrenbohren</b><br>CNC - jig boring                 | <b>Verfahrweg</b><br>Travelling distance  | <b>3.000 x 1.600 x 600 mm</b>   |
| <b>CNC - Portalfräsen</b><br>CNC - portal milling             | <b>Verfahrweg</b><br>Travelling distance  | <b>7.000 x 3.000 x 1.400 mm</b> |
| <b>CNC - Fräsen und Bohren</b><br>CNC - milling and -drilling | <b>Verfahrweg</b><br>Travelling distance  | <b>4.900 x 2.400 x 800 mm</b>   |
| <b>CNC - Portalmessen</b><br>CNC - portal measuring           | <b>Verfahrweg</b><br>Travelling distance  | <b>3.000 x 1.600 x 800 mm</b>   |
| <b>CNC - Tieflochbohren</b><br>CNC - gun drilling             | <b>Durchmesser 30 – 120 mm / Diameter 30 – 120 mm</b><br>bis 1.500 mm als Sacklochbohrung / Blind holes up to 1.500 mm deep<br>bis 3.000 mm als Durchgangsbohrung / Through holes up to 3.000 mm long |                                 |

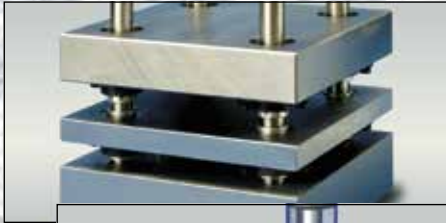
Die Herstellung/Bearbeitung der Produkte erfolgt nach Kundenzeichnung oder nach CAD-Datei im DXF-, DWG-, IGES-, VDA- oder Catia-Format. / Basis for the manufacturing process are drawings supplied by the customer, printed or as DXF-, DWG-, IGES-, VDA- or Catia - CAD - data files.





Märkische Stanz-Partner

# [lieferprogramm] [productrange]

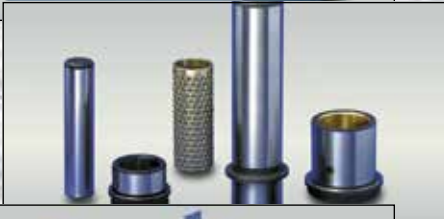


## [säulengestelle]

in Standard- und Sonder-  
Abmessungen ab 125 x 125 mm  
bis 3.000 x 6.000 mm

## [diesets]

in standard and custom sizes  
between 125 x 125 mm up to  
3.000 x 6.000 mm



## [führungssysteme]

in den verschiedensten  
Ausführungen

## [guidingsystems]

available in various designs



## [schneidelemente]

mit unterschiedlichsten  
Schneidgeometrien

## [cuttingelements]

with countless cutting-tip  
geometries



## [technischeHilfsmittel]

umfangreiche Auswahl von  
Schrauben bis zu kleinen  
Schiebern

## [generaldiecomponents]

huge selection ranging from  
screws to small cam units



## [federelemente]

umfassendes Programm an ISO-,  
Elastomer- und ähnlichen Federn

## [springs]

extensive program of ISO-,  
elastomer- and similar springs



## [nitrocy]Gasdruckfedern]

umfangreiches Programm für  
unterschiedliche Anwendungen

## [nitrocy]GasSprings]

large program for all commonly  
used applications



## [hysonStickstoffSysteme]

große Auswahl aus dem Programm  
eines der Weltmarktführer

## [hysonNitrogenSystems]

huge program from one of the  
world market leaders

**Märkische Stanz-Partner Normalien GmbH**

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Our general terms and conditions, which we gladly provide / send on your request, apply at all times.







**MSP** GN GM BH

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**[führungssysteme]**



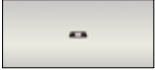




**[guidingsystems]**

[FS]

|     | <b>Führungselemente,<br/>M-Line</b>   | <b>Guidingelements,<br/>M-Line</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|---|--|--------------------------------|-----------------------|
|    | <u>Führungsbuchsen mit Bund,<br/>Kugelführung, M-Line, kurzer Bund</u>                    | <u>Leader pin bushings, with collar,<br/>ball bearing, M-Line, short headed</u>        | <b>FS 357</b>                  | <b>FS.5</b>           |
|    | <u>Führungsbuchsen mit Bund,<br/>Kugelführung, M-Line, langer Bund</u>                    | <u>Leader pin bushings, with collar,<br/>ball bearing, M-Line, long headed</u>         | <b>FS 353<br/>FS 358</b>       | <b>FS.5</b>           |
|    | <u>Führungsbuchsen mit Bund,<br/>Stahl/Bronze, M-Line, kurzer Bund</u>                    | <u>Leader pin bushings, with collar,<br/>steel/bronze, M-Line, short headed</u>        | <b>FS 331</b>                  | <b>FS.4</b>           |
|    | <u>Führungsbuchsen mit Bund,<br/>Stahl/Bronze, M-Line, langer Bund</u>                    | <u>Leader pin bushings, with collar,<br/>steel/bronze, M-Line, long headed</u>         | <b>FS 351<br/>FS 355</b>       | <b>FS.4</b>           |
|    | <u>Führungsbuchsen mit Bund,<br/>Stahlführung, M-Line, kurzer Bund<br/>RM-beschichtet</u> | <u>Leader pin bushings, with collar,<br/>steel, M-Line, short headed<br/>RM-coated</u> | <b>FS 330 RM</b>               | <b>FS.3</b>           |
|    | <u>Führungsbuchsen mit Bund,<br/>Stahlführung, M-Line, langer Bund<br/>RM-beschichtet</u> | <u>Leader pin bushings, with collar,<br/>steel, M-Line, long headed<br/>RM-coated</u>  | <b>FS 340 RM<br/>FS 350 RM</b> | <b>FS.3</b>           |
|    | <u>Führungssäulen, zylindrisch,<br/>zum Einpressen, M-Line</u>                            | <u>Leader pins, cylindrical,<br/>for press fitting, M-Line</u>                         | <b>FS 320</b>                  | <b>FS.1</b>           |
|   | <u>Haltescheiben für Bundsäulen-<br/>befestigung</u>                                      | <u>Holding disks</u>   | <b>FS 398</b>                  | <b>FS.7</b>           |
|  | <u>Haltestücke</u>  | <u>Holding clamps</u>  | <b>FS 395 / A - C</b>          | <b>FS.7</b>           |
|  | <u>Kugelkäfige aus Messing, M-Line</u>  | <u>Ball cages, brass, M-Line</u>   | <b>FS 325</b>                  | <b>FS.6</b>           |
|  | <u>Schnellwechsel-Führungssäulen<br/>mit Bund, M-Line</u>                                 | <u>Quick change leader pins with collar,<br/>M-Line</u>                                | <b>FS 319</b>                  | <b>FS.2</b>           |

|   | <b>Führungssäulen</b>   | <b>Leader pins</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b>  |
|---|---|--|--------------------------------|------------------------|
|  | <u>Führungssäulen für Großwerkzeuge<br/>nach DIN 9833</u>             | <u>Leader pins for large dies,<br/>DIN 9833</u>                  | <b>FS 410<br/>FS 412</b>       | <b>FS.10<br/>FS.11</b> |
|  | <u>Führungssäulen, zylindrisch,<br/>zum Einpressen, nach DIN 9825</u> | <u>Leader pins, cylindrical,<br/>for press fitting, DIN 9825</u> | <b>FS 420</b>                  | <b>FS.8</b>            |
|  | <u>Schnellwechsel-Führungssäulen<br/>mit Bund</u>                     | <u>Quick change leader pins with collar</u>                      | <b>FS 419</b>                  | <b>FS.9</b>            |

|    | <b>Führungsbuchsen</b>  | <b>Leader pin bushings</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|---|--|--------------------------------|-----------------------|
|    | <u>Führungsbuchsen mit Bund,<br/>Bronze beschichtet, kurzer Bund</u>              | <u>Leader pin bushings, with collar,<br/>bronze plated, short headed</u>                 | FS 631<br>FS 632               | FS.15<br>FS.16        |
|    | <u>Führungsbuchsen mit Bund,<br/>Bronze beschichtet, langer Bund</u>              | <u>Leader pin bushings, with collar,<br/>bronze plated, long headed</u>                  | FS 641, FS 651<br>FS 655       | FS.15<br>FS.16        |
|    | <u>Führungsbuchsen mit Bund,<br/>Gleitschicht Sintermetall, kurzer Bund</u>       | <u>Leader pin bushings, with collar,<br/>sinter-metal plated, short headed</u>           | FS 731<br>FS 732               | FS.13<br>FS.14        |
|    | <u>Führungsbuchsen mit Bund,<br/>Gleitschicht Sintermetall, langer Bund</u>       | <u>Leader pin bushings, with collar,<br/>sinter-metal plated, long headed</u>            | FS 741, FS 751<br>FS 755       | FS.13<br>FS.14        |
|    | <u>Führungsbuchsen mit Bund,<br/>Kugelführung</u>                                 | <u>Leader pin bushings, with collar,<br/>for ball bearing application</u>                | FS 457, FS 458<br>FS 453       | FS.17                 |
|    | <u>Führungsbuchsen mit Bund,<br/>Stahlführung, kurzer Bund<br/>RM-beschichtet</u> | <u>Leader pin bushings, with collar,<br/>steel, short headed<br/>RM-coated</u>           | FS 430 RM<br>FS 439 RM         | FS.12                 |
|    | <u>Führungsbuchsen mit Bund,<br/>Stahlführung, langer Bund<br/>RM-beschichtet</u> | <u>Leader pin bushings, with collar,<br/>steel, long headed<br/>RM-coated</u>            | FS 440 RM<br>FS 450 RM         | FS.12                 |
|  | <u>Führungsbuchsen mit Festschmierstoff</u>                                       | <u>Leader pin bushings with self lubricating<br/>graphite plugs</u>                      | FS 462                         | FS.26                 |
|  | <u>Führungsbuchsen mit Festschmierstoff<br/>NAAMS</u>                             | <u>Leader pin bushings with self lubricating<br/>graphite plugs, NAAMS</u>               | FS 461                         | FS.25                 |
|  | <u>Führungsbuchsen mit Festschmierstoff<br/>nach DIN 9834 / ISO 9448</u>          | <u>Leader pin bushings with self lubricating<br/>graphite plugs, DIN 9834 / ISO 9448</u> | FS 460                         | FS.23                 |

|  | <b>Kugelkäfige und Befestigungselemente</b> | <b>Ball cages and mounting elements</b> | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|---|---|--------------------------------|-----------------------|
|  | <u>Abgehängte Kugelkäfige</u>               | <u>Ball cages with circlip</u>          | FS 424                         | FS.19<br>FS.20        |
|  | <u>Befestigungselemente RA</u>              | <u>Mounting elements RA</u>             | FS 424 / RA                    | FS.22                 |
|  | <u>Befestigungselemente SI</u>              | <u>Mounting elements SI</u>             | FS 424 / SI                    | FS.21                 |
|  | <u>Befestigungselemente TR</u>              | <u>Mounting elements TR</u>             | FS 424 / TR                    | FS.21                 |
|  | <u>Befestigungselemente VI</u>              | <u>Mounting elements VI</u>             | FS 424 / VI                    | FS.22                 |
|  | <u>Kugelkäfige aus Messing</u>              | <u>Ball cages, brass</u>                | FS 425                         | FS.18                 |

[FS]

[FS]

|  | <b>Gleitplatten</b>  | <b>Wear plates</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b>  |
|--|--|--|--------------------------------|------------------------|
|  | <u>Führungsglaschen,<br/>Stahl mit Festschmierstoff</u>                  | <u>Guide brackets, steel with self<br/>lubricating graphite plugs</u>                    | <b>FS 509</b>                  | <b>FS.38</b>           |
|  | <u>Gleitleisten VDI 3357 Bronze mit<br/>Festschmierstoff</u>             | <u>Wear strips VDI 3357 with self<br/>lubricating graphite plugs</u>                     | <b>FS 506</b>                  | <b>FS.35</b>           |
|  | <u>Gleitplatten, Bronze mit Festschmierstoff,<br/>5 mm dick</u>          | <u>Wear plates, bronze with self<br/>lubricating graphite plugs, 5 mm thick</u>          | <b>FS 505</b>                  | <b>FS.34</b>           |
|  | <u>Gleitplatten, Bronze mit Festschmierstoff,<br/>10 mm dick</u>         | <u>Wear plates, bronze with self<br/>lubricating graphite plugs, 10 mm thick</u>         | <b>FS 503<br/>FS 504</b>       | <b>FS.32<br/>FS.33</b> |
|  | <u>Gleitplatten VDI 3357 Bronze mit<br/>Festschmierstoff, 12 mm dick</u> | <u>Wear plates VDI 3357 with self<br/>lubricating graphite plugs, 12 mm thick</u>        | <b>FS 502</b>                  | <b>FS.31</b>           |
|  | <u>Gleitplatten VDI 3357 Bronze mit<br/>Festschmierstoff, 20 mm dick</u> | <u>Wear plates VDI 3357 with self<br/>lubricating graphite plugs, 20 mm thick</u>        | <b>FS 500</b>                  | <b>FS.29</b>           |
|  | <u>Gleitplatten VDI 3357, Stahl,<br/>20 mm dick</u>                      | <u>Wear plates VDI 3357, steel,<br/>20 mm thick</u>                                      | <b>FS 501</b>                  | <b>FS.30</b>           |
|  | <u>Prismenführungen, VDI 3357,<br/>Bronze mit Festschmierstoff</u>       | <u>„V“ drivers, VDI 3357, bronze with self<br/>lubricating graphite plugs</u>            | <b>FS 526</b>                  | <b>FS.42</b>           |
|  | <u>Prismenführungen, VDI 3357, Stahl</u>                                 | <u>„V“ drivers, VDI 3357, steel</u>  | <b>FS 524</b>                  | <b>FS.41</b>           |
|  | <u>Überlaufkeile, VDI 3357, Bronze mit<br/>Festschmierstoff</u>          | <u>Cam dwells, VDI 3357, bronze with self<br/>lubricating graphite plugs</u>             | <b>FS 507</b>                  | <b>FS.36</b>           |
|  | <u>Überlaufkeile, VDI 3357, Stahl</u>                                    | <u>Cam dwells, VDI 3357, steel</u>   | <b>FS 508</b>                  | <b>FS.37</b>           |
|  | <u>Winkelleisten, Bronze mit<br/>Festschmierstoff</u>                    | <u>„L“ shaped wear plates, bronze with self<br/>lubricating graphite plugs</u>           | <b>FS 510</b>                  | <b>FS.39</b>           |
|  | <u>Winkelleisten, VDI 3357, Bronze mit<br/>Festschmierstoff</u>          | <u>„L“ shaped wear plates, VDI 3357,<br/>bronze with self lubricating graphite plugs</u> | <b>FS 511</b>                  | <b>FS.40</b>           |

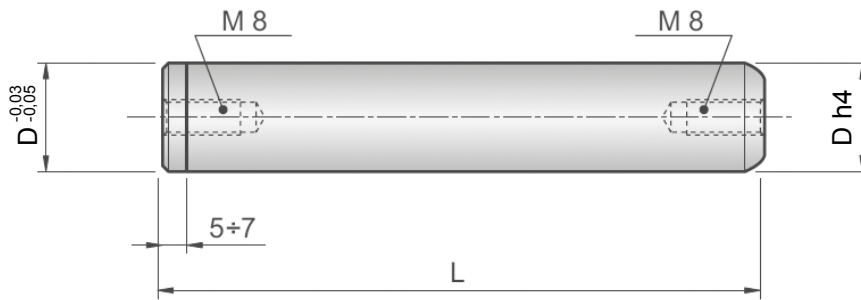
|  | <b>Zubehör Bereich<br/>Führungssysteme</b>  | <b>Elements product line<br/>„guiding systems“</b>  | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|--|---|---|--------------------------------|-----------------------|
|  | <u>Haltescheiben für Bundsäulen-<br/>befestigung</u>                                  | <u>Holding disks</u>  | <b>FS 958</b>                  | <b>FS.28</b>          |
|  | <u>Haltestücke für Führungsbuchsen mit<br/>Festschmierstoff n.DIN 9834 / ISO 9448</u> | <u>Holding clamps for bronze leader pin<br/>bushings with selflubricating graphite<br/>plugs, DIN 9834 / ISO 9448</u> | <b>FS 460 HS</b>               | <b>FS.24</b>          |
|  | <u>Haltestücke für Säulen- und<br/>Buchsenbefestigung</u>                             | <u>Holding clamps for holding leader pins<br/>and -bushings</u>   | <b>FS 955</b>                  | <b>FS.27</b>          |

FS 320

Mat.: 1.7131 / 61 - 63 HRC

Mat.: 1.7131 / 61 - 63 HRC

FS 320 / 25 x 200



| D     | L   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|       | 100 | 112 | 125 | 140 | 160 | 180 | 200 | 224 | 250 | 280 | 315 | 355 | 400 | 450 | 500 | 600 | 700 | 800 |
| 19-20 | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |     |     |     |     |     |     |
| 24-25 |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |
| 30-32 |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |
| 38-40 |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |
| 48-50 |     |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |
| 60-63 |     |     |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |
| 80    |     |     |     |     |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   |

[FS]



FS 319

Mat.: 1.7131 / 61 - 63 HRC

Mat.: 1.7131 / 61 - 63 HRC

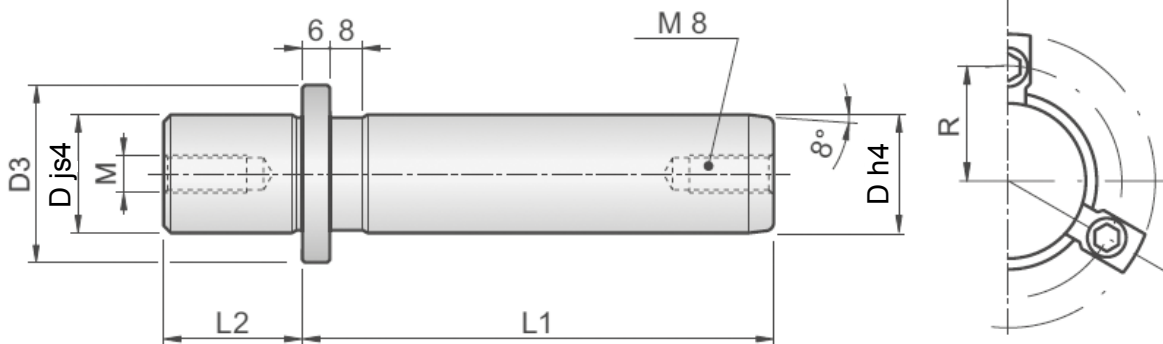
FS 319 / 25 x 160

Lieferumfang:

- 3 Halteklammern mit Schrauben
- alternativ, wenn angegeben:
- 1 Haltescheibe FS 398 mit Schraube

Included:

- 3 holding clamps with screws
- alternatively, if specified:
- 1 mount disk FS 398 with screw



| D     | D3 | M   | R    | L2 |
|-------|----|-----|------|----|
| 19-20 | 25 | M8  | 18,0 | 23 |
| 24-25 | 32 | M8  | 21,5 | 30 |
| 30-32 | 40 | M8  | 25,5 | 37 |
| 38-40 | 50 | M8  | 30,5 | 37 |
| 48-50 | 63 | M8  | 37,0 | 47 |
| 60-63 | 80 | M8  | 45,5 | 47 |
| 80    | 95 | M12 | 53,0 | 60 |

| D     | L1  |     |     |     |     |     |     |     |     |     |     |     |     |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|       | 100 | 112 | 125 | 140 | 160 | 180 | 200 | 224 | 250 | 280 | 315 | 355 | 400 |
| 19-20 | •   | •   | •   | •   | •   | •   | •   |     |     |     |     |     |     |
| 24-25 | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |     |
| 30-32 |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |
| 38-40 |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |
| 48-50 |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 60-63 |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 80    |     |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   |



# Führungsbuchsen mit Bund, RM-beschichtet, M-Line

## Leader pin bushings with collar, RM plated, M-Line



FÜHRUNGSSYSTEME / GUIDINGSYSTEMS

mit langem Bund/long-headed style

**FS 340 ... RM**

**FS 350 ... RM**



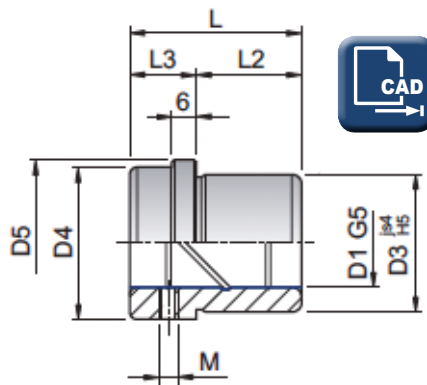
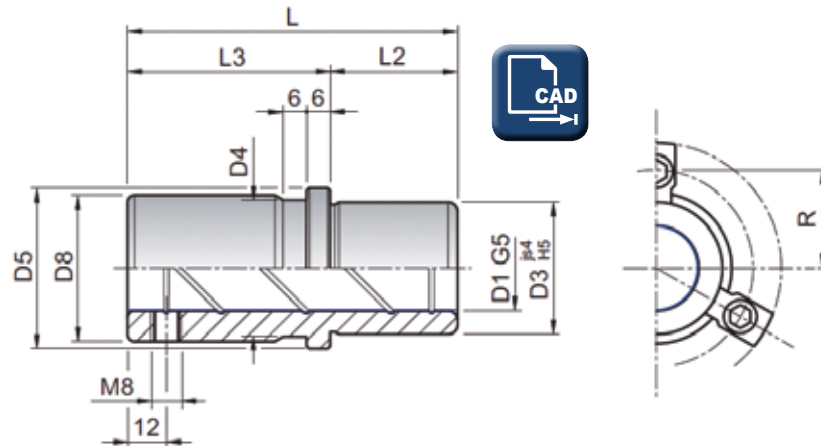
Mat.: 1.7131 / 61 - 63 HRC  
RM-beschichtet (selbstschmierend)

Lieferumfang:  
• 3 Halteklammern mit Schrauben

Mat.: 1.7131 / 61 - 63 HRC  
RM-coated (self lubricating)

Included:  
• 3 holding clamps with screws

**FS 340 / 25 x 59 / RM**



mit kurzem Bund/short-headed style

**FS 330 ... RM**



| D1    | D3 | D4 | D5 | D8 | Artikelnummer<br>Article number | R    | L   | L2 | L3 |
|-------|----|----|----|----|---------------------------------|------|-----|----|----|
| 19-20 | 32 | 32 | 40 | -  | FS 330 ... RM                   | 26   | 35  | 23 | 12 |
| 19-20 | 32 | 32 | 40 | 39 | FS 340 ... RM                   | 26   | 43  | 23 | 20 |
| 19-20 | 32 | 32 | 40 | 39 | FS 350 ... RM                   | 26   | 59  | 23 | 36 |
| 24-25 | 40 | 40 | 48 | -  | FS 330 ... RM                   | 30   | 35  | 23 | 12 |
| 24-25 | 40 | 40 | 48 | 46 | FS 340 ... RM                   | 30   | 59  | 23 | 36 |
| 24-25 | 40 | 40 | 48 | 46 | FS 350 ... RM                   | 30   | 79  | 23 | 56 |
| 30-32 | 48 | 48 | 56 | -  | FS 330 ... RM                   | 33,5 | 42  | 30 | 12 |
| 30-32 | 48 | 48 | 56 | 53 | FS 340 ... RM                   | 33,5 | 75  | 30 | 45 |
| 30-32 | 48 | 48 | 56 | 53 | FS 350 ... RM                   | 33,5 | 93  | 30 | 63 |
| 38-40 | 58 | 58 | 66 | -  | FS 330 ... RM                   | 38,5 | 52  | 37 | 15 |
| 38-40 | 58 | 58 | 66 | 63 | FS 340 ... RM                   | 38,5 | 82  | 37 | 45 |
| 38-40 | 58 | 58 | 66 | 63 | FS 350 ... RM                   | 38,5 | 108 | 37 | 71 |
| 48-50 | 70 | 70 | 80 | -  | FS 330 ... RM                   | 45,5 | 65  | 47 | 18 |
| 48-50 | 70 | 70 | 80 | 77 | FS 340 ... RM                   | 45,5 | 97  | 47 | 50 |
| 48-50 | 70 | 70 | 80 | 77 | FS 350 ... RM                   | 45,5 | 127 | 47 | 80 |
| 60-63 | 85 | 85 | 95 | -  | FS 330 ... RM                   | 53   | 80  | 60 | 20 |
| 60-63 | 85 | 85 | 95 | 92 | FS 340 ... RM                   | 53   | 116 | 60 | 56 |
| 60-63 | 85 | 85 | 95 | 92 | FS 350 ... RM                   | 53   | 150 | 60 | 90 |

[FS]

mit langem Bund/long-headed style

**FS 351**  
**FS 355**

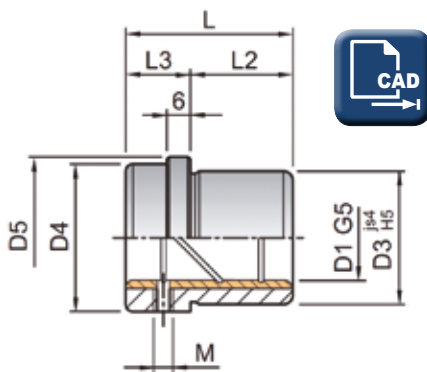
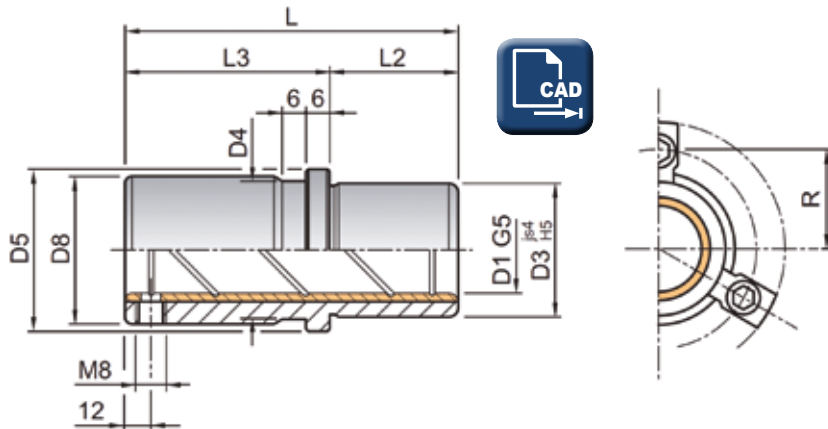
Mat.: 1.7131 + Bronze  
Härte: 61 - 63 HRC

Lieferumfang:  
• 3 Halteklammern mit Schrauben

Mat.: 1.7131 + bronze  
Hardness: 61 - 63 HRC

Included:  
• 3 holding clamps with screws

**FS 331 / 25 x 35**



Führungsbuchsen können auch  
RM-beschichtet werden /  
Leader pin bushings can be  
delivered RM-coated.

mit kurzem Bund/short-headed style

**FS 331**



| D1    | D3 | D4 | D5 | D8 | Artikelnummer<br>Article number | R    | L   | L2 | L3 |
|-------|----|----|----|----|---------------------------------|------|-----|----|----|
| 19-20 | 32 | 32 | 40 | -  | FS 331                          | 26   | 35  | 23 | 12 |
| 19-20 | 32 | 32 | 40 | 39 | FS 351                          | 26   | 43  | 23 | 20 |
| 19-20 | 32 | 32 | 40 | 39 | FS 355                          | 26   | 59  | 23 | 36 |
| 24-25 | 40 | 40 | 48 | -  | FS 331                          | 30   | 35  | 23 | 12 |
| 24-25 | 40 | 40 | 48 | 46 | FS 351                          | 30   | 59  | 23 | 36 |
| 24-25 | 40 | 40 | 48 | 46 | FS 355                          | 30   | 79  | 23 | 56 |
| 30-32 | 48 | 48 | 56 | -  | FS 331                          | 33,5 | 42  | 30 | 12 |
| 30-32 | 48 | 48 | 56 | 53 | FS 351                          | 33,5 | 75  | 30 | 45 |
| 30-32 | 48 | 48 | 56 | 53 | FS 355                          | 33,5 | 93  | 30 | 63 |
| 38-40 | 58 | 58 | 66 | -  | FS 331                          | 38,5 | 52  | 37 | 15 |
| 38-40 | 58 | 58 | 66 | 63 | FS 351                          | 38,5 | 82  | 37 | 45 |
| 38-40 | 58 | 58 | 66 | 63 | FS 355                          | 38,5 | 108 | 37 | 71 |
| 48-50 | 70 | 70 | 80 | -  | FS 331                          | 45,5 | 65  | 47 | 18 |
| 48-50 | 70 | 70 | 80 | 77 | FS 351                          | 45,5 | 97  | 47 | 50 |
| 48-50 | 70 | 70 | 80 | 77 | FS 355                          | 45,5 | 127 | 47 | 80 |
| 60-63 | 85 | 85 | 95 | -  | FS 331                          | 53   | 80  | 60 | 20 |
| 60-63 | 85 | 85 | 95 | 92 | FS 351                          | 53   | 116 | 60 | 56 |
| 60-63 | 85 | 85 | 95 | 92 | FS 355                          | 53   | 150 | 60 | 90 |





mit langem Bund/long-headed style

**FS 358**  
**FS 353**

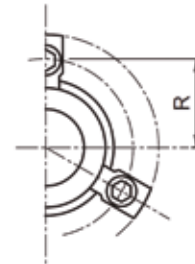
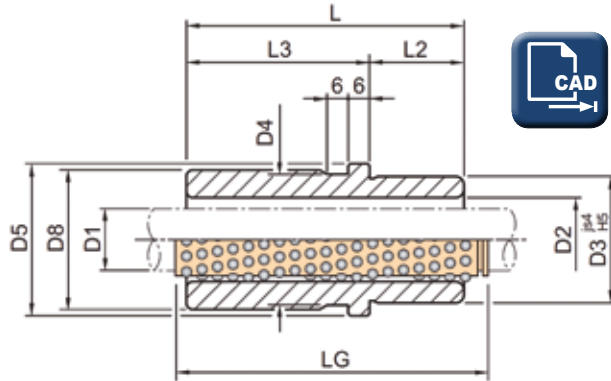
Mat.: 1.7131 / 61 - 63 HRC

Lieferumfang:  
• 3 Halteklammern mit Schrauben

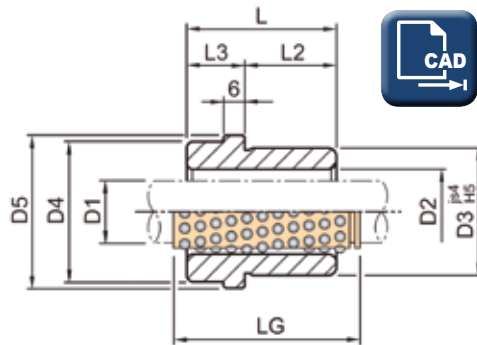
Mat.: 1.7131 / 61 - 63 HRC

Included:  
• 3 holding clamps with screws

 **FS 358 / 25 x 59**



Führungsbuchsen können auch  
RM-beschichtet werden /  
Leader pin bushings can be  
delivered RM-coated.



mit kurzem Bund/short-headed style

**FS 357**



| D1    | D2    | D3  | D4  | D5  | D8  | Artikelnummer<br>Article number | R    | L          | L2 | L3 | Vorschlag<br>Proposal<br>LG |
|-------|-------|-----|-----|-----|-----|---------------------------------|------|------------|----|----|-----------------------------|
| 19-20 | 25-26 | 32  | 32  | 40  | -   | <b>FS 357</b>                   | 26   | <b>35</b>  | 23 | 12 | 45                          |
| 19-20 | 25-26 | 32  | 32  | 40  | 39  | <b>FS 358</b>                   | 26   | <b>43</b>  | 23 | 20 | 56                          |
| 19-20 | 25-26 | 32  | 32  | 40  | 39  | <b>FS 353</b>                   | 26   | <b>59</b>  | 23 | 36 | 71                          |
| 24-25 | 30-31 | 40  | 40  | 48  | -   | <b>FS 357</b>                   | 30   | <b>35</b>  | 23 | 12 | 45                          |
| 24-25 | 30-31 | 40  | 40  | 48  | 46  | <b>FS 358</b>                   | 30   | <b>59</b>  | 23 | 36 | 71                          |
| 24-25 | 30-31 | 40  | 40  | 48  | 46  | <b>FS 353</b>                   | 30   | <b>79</b>  | 23 | 56 | 95                          |
| 30-32 | 38-40 | 48  | 48  | 56  | -   | <b>FS 357</b>                   | 33,5 | <b>42</b>  | 30 | 12 | 56                          |
| 30-32 | 38-40 | 48  | 48  | 56  | 53  | <b>FS 358</b>                   | 33,5 | <b>75</b>  | 30 | 45 | 95                          |
| 30-32 | 38-40 | 48  | 48  | 56  | 53  | <b>FS 353</b>                   | 33,5 | <b>93</b>  | 30 | 63 | 120                         |
| 38-40 | 46-48 | 58  | 58  | 66  | -   | <b>FS 357</b>                   | 38,5 | <b>52</b>  | 37 | 15 | 63                          |
| 38-40 | 46-48 | 58  | 58  | 66  | 63  | <b>FS 358</b>                   | 38,5 | <b>82</b>  | 37 | 45 | 105                         |
| 38-40 | 46-48 | 58  | 58  | 66  | 63  | <b>FS 353</b>                   | 38,5 | <b>108</b> | 37 | 71 | 120                         |
| 48-50 | 56-58 | 70  | 70  | 80  | -   | <b>FS 357</b>                   | 45,5 | <b>65</b>  | 47 | 18 | 80                          |
| 48-50 | 56-58 | 70  | 70  | 80  | 77  | <b>FS 358</b>                   | 45,5 | <b>97</b>  | 47 | 50 | 120                         |
| 48-50 | 56-58 | 70  | 70  | 80  | 77  | <b>FS 353</b>                   | 45,5 | <b>127</b> | 47 | 80 | 140                         |
| 60-63 | 68-71 | 85  | 85  | 95  | -   | <b>FS 357</b>                   | 53   | <b>80</b>  | 60 | 20 | 95                          |
| 60-63 | 68-71 | 85  | 85  | 95  | 92  | <b>FS 358</b>                   | 53   | <b>116</b> | 60 | 56 | 140                         |
| 60-63 | 68-71 | 85  | 85  | 95  | 92  | <b>FS 353</b>                   | 53   | <b>150</b> | 60 | 90 | 160                         |
| 80    | 92    | 105 | 105 | 118 | -   | <b>FS 357</b>                   | 64,5 | <b>80</b>  | 60 | 20 | 120                         |
| 80    | 92    | 105 | 105 | 118 | 115 | <b>FS 358</b>                   | 64,5 | <b>120</b> | 60 | 60 | 140                         |
| 80    | 92    | 105 | 105 | 118 | 115 | <b>FS 353</b>                   | 64,5 | <b>150</b> | 60 | 90 | 160                         |

[FS]

**FS 325**

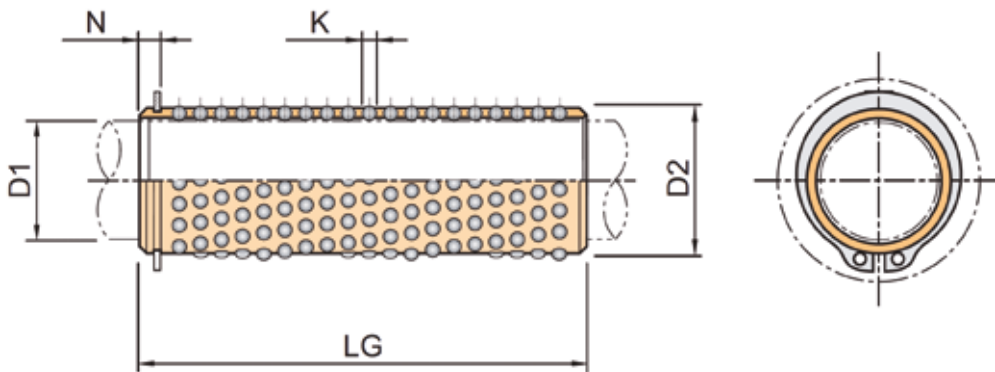
Mat.: Messing  
Stahlkugeln: Güteklasse AAA

Mat.: Brass  
Steel balls, grade AAA

**FS 325 / 25 x 71**

Sicherungsring im Lieferumfang  
enthalten.

Safety ring included



| D1 | LG |    |    |    |    |    |    |    |     |     |     |     |     |     |     | D2 | K | N    |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|----|---|------|
|    | 40 | 45 | 50 | 56 | 63 | 71 | 80 | 95 | 105 | 120 | 140 | 160 | 180 | 200 | 240 |    |   |      |
| 19 |    | •  |    | •  |    | •  | •  | •  |     |     |     |     |     |     |     | 25 | 3 | 2,9  |
| 20 |    | •  |    | •  |    | •  | •  | •  |     |     |     |     |     |     |     | 26 | 3 | 2,9  |
| 24 | •  | •  |    | •  |    | •  | •  | •  |     | •   |     |     |     |     |     | 30 | 3 | 3,2  |
| 25 | •  | •  |    | •  |    | •  | •  | •  |     | •   |     |     |     |     |     | 31 | 3 | 3,2  |
| 30 | •  | •  | •  | •  |    | •  | •  | •  | •   | •   | •   | •   |     |     |     | 38 | 4 | 3,95 |
| 32 | •  | •  | •  | •  |    | •  | •  | •  | •   | •   | •   | •   |     |     |     | 40 | 4 | 3,95 |
| 38 |    | •  | •  | •  | •  |    | •  | •  | •   | •   | •   | •   | •   | •   | •   | 46 | 4 | 3,95 |
| 40 |    | •  | •  | •  | •  |    | •  | •  | •   | •   | •   | •   | •   | •   | •   | 48 | 4 | 3,95 |
| 48 |    |    | •  |    | •  |    | •  | •  | •   | •   | •   | •   | •   | •   | •   | 56 | 4 | 4,25 |
| 50 |    |    | •  |    | •  |    | •  | •  | •   | •   | •   | •   | •   | •   | •   | 58 | 4 | 4,25 |
| 60 |    |    |    |    |    |    |    | •  | •   | •   | •   | •   | •   | •   | •   | 68 | 4 | 4,75 |
| 63 |    |    |    |    |    |    |    | •  | •   | •   | •   | •   | •   | •   | •   | 71 | 4 | 4,75 |
| 80 |    |    |    |    |    |    |    |    |     | •   | •   | •   | •   | •   | •   | 92 | 6 | 6,15 |

[FS]



**FS 395 / A - C**

FS 395 / A für Ø 19-20, 24-25

FS 395 / B für Ø 19-20, 24-25, 30-32, 38-40, 48-50, 60-63, 80

FS 395 / C für Ø 30-32, 38-40, 48-50, 60-63, 80

FS 395 / A for Ø 19-20, 24-25

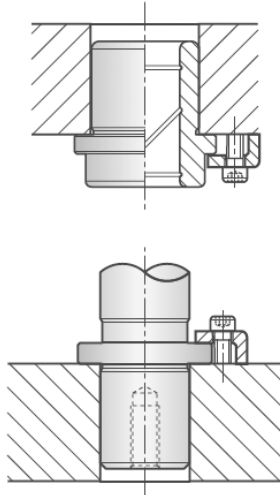
FS 395 / B for Ø 19-20, 24-25, 30-32, 38-40, 48-50, 60-63, 80

FS 395 / C for Ø 30-32, 38-40, 48-50, 60-63, 80

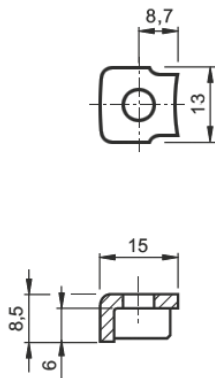
Haltestücke werden mit Schrauben geliefert.

Holding clamps include screws.

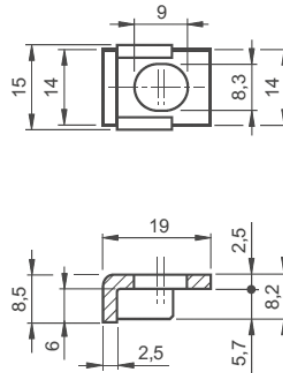
**FS 395 / A**



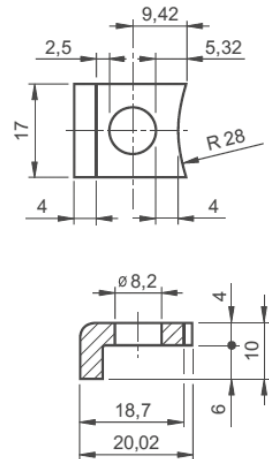
**FS 395 / A**



**FS 395 / B**



**FS 395 / C**

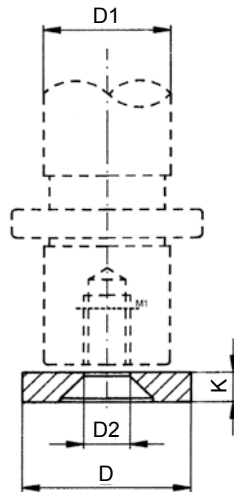


**FS 398**

Mat.: C 40, brüniert  
Scheibe wird mit Schraube befestigt

Mat.: C 40, gunmetal-finished  
Mount disk with screw.

**FS 398 / 1**



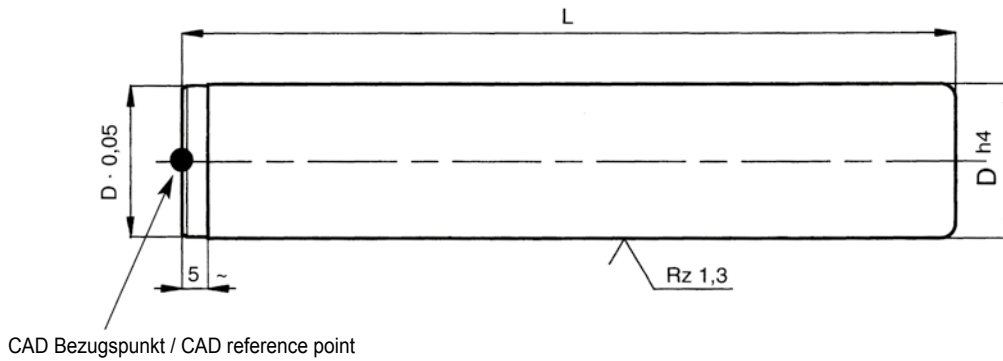
| Ausführung Style | D1    | D  | K  | D2   |
|------------------|-------|----|----|------|
| 1                | 19-20 | 25 | 6  | 8,5  |
| 2                | 24-25 | 32 | 6  | 8,5  |
| 3                | 30-32 | 40 | 6  | 8,5  |
| 4                | 38-40 | 50 | 6  | 8,5  |
| 5                | 48-50 | 60 | 6  | 8,5  |
| 6                | 60-63 | 70 | 6  | 8,5  |
| 7                | 80    | 93 | 12 | 12,5 |

FS 420

Mat.: 1.5732 / 61 - 63 HRC

Mat.: 1.5732 / 61 - 63 HRC

FS 420 / 24 x 200



| D     | L   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Aufnahmebohrung<br>Mounting hole |     |    |                  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------------------------------|-----|----|------------------|
|       | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 | 280 | 300 | 320 | 350 | 360                              | 400 | R7 |                  |
| 18-19 | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |     |     |     |     |     |     |     |     |                                  |     |    | -0,020<br>-0,041 |
| 24-25 |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |                                  |     |    | -0,020<br>-0,041 |
| 30-32 |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     |                                  |     |    | -0,025<br>-0,050 |
| 40-42 |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |                                  | •   |    | -0,025<br>-0,050 |
| 50-52 |     |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |                                  | •   |    | -0,030<br>-0,060 |
| 63    |     |     |     |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     | •                                | •   |    | -0,030<br>-0,060 |
| 80    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | •   | •   | •   |     | •                                | •   |    | -0,032<br>-0,062 |



### FS 419

Mat.: 1.5732 / 61 - 63 HRC

Mat.: 1.5732 / 61 - 63 HRC

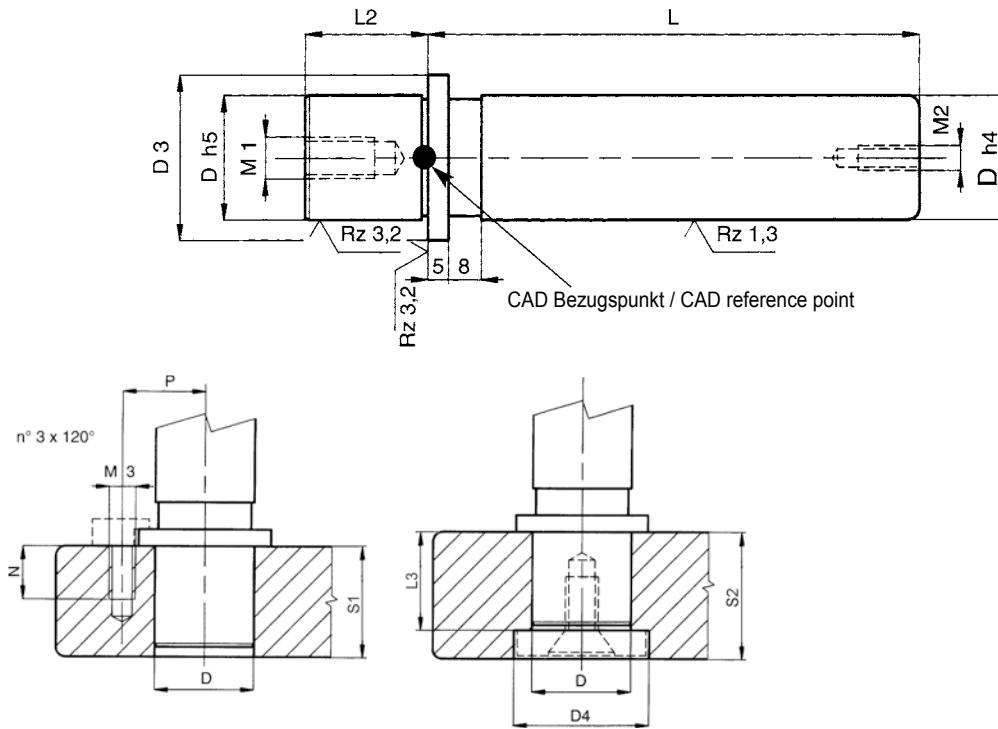
FS 419 / 25 x 160

Lieferumfang:

- bei Haltestückverschraubung mit 3 Halteklammern
- bei Scheibenbefestigung mit Haltescheibe

Included:

- if fixed with clamps: 3 clamps
- if fixed with disk: 1 disk



| D  | D3 | D4 | L2 | L3 | M1  | M2  | M3 | N  | P    | S1min | S2min |
|----|----|----|----|----|-----|-----|----|----|------|-------|-------|
| 18 | 25 | 27 | 20 | 21 | M8  | M6  | M6 | 12 | 16   | 23    | 28    |
| 19 | 25 | 27 | 20 | 21 | M8  | M6  | M6 | 12 | 16   | 23    | 28    |
| 24 | 32 | 34 | 25 | 26 | M10 | M6  | M6 | 12 | 19,5 | 28    | 33    |
| 25 | 32 | 34 | 25 | 26 | M10 | M6  | M6 | 12 | 19,5 | 28    | 33    |
| 30 | 40 | 41 | 30 | 31 | M10 | M6  | M8 | 16 | 25   | 33    | 38    |
| 32 | 40 | 41 | 30 | 31 | M10 | M6  | M8 | 16 | 25   | 33    | 38    |
| 40 | 50 | 52 | 35 | 36 | M12 | M8  | M8 | 16 | 30   | 38    | 48    |
| 42 | 50 | 52 | 35 | 36 | M12 | M8  | M8 | 16 | 30   | 38    | 48    |
| 50 | 62 | 64 | 45 | 46 | M12 | M8  | M8 | 16 | 36   | 48    | 58    |
| 52 | 62 | 64 | 45 | 46 | M12 | M8  | M8 | 16 | 36   | 48    | 58    |
| 63 | 73 | 75 | 49 | 50 | M12 | M10 | M8 | 16 | 41,5 | 53    | 63    |
| 80 | 93 | 95 | 59 | 60 | M12 | M10 | M8 | 16 | 51,5 | 63    | 73    |

| D     | L   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | Aufnahmebohrung<br>Mounting hole<br>JS6 |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
|       | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 360 | 400 |   |
| 18-19 | •   | •   | •   | •   | •   | •   | •   |     |     |     |     |     |     |     |     |     |     |     | ±0,006                                  |
| 24-25 | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |     |     |     |     |     |     |     | ±0,006                                  |
| 30-32 |     |     | •   | •   | •   | •   | •   | •   | •   | •   |     |     |     |     |     |     |     |     | ±0,006                                  |
| 40-42 |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     |     | ±0,006                                  |
| 50-52 |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | ±0,006                                  |
| 63    |     |     |     |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   |     |     | ±0,010                                  |
| 80    |     |     |     |     |     |     |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   | •   | ±0,010                                  |

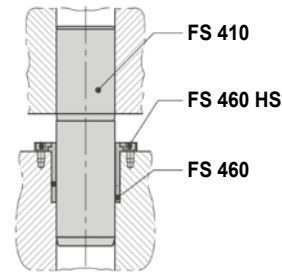
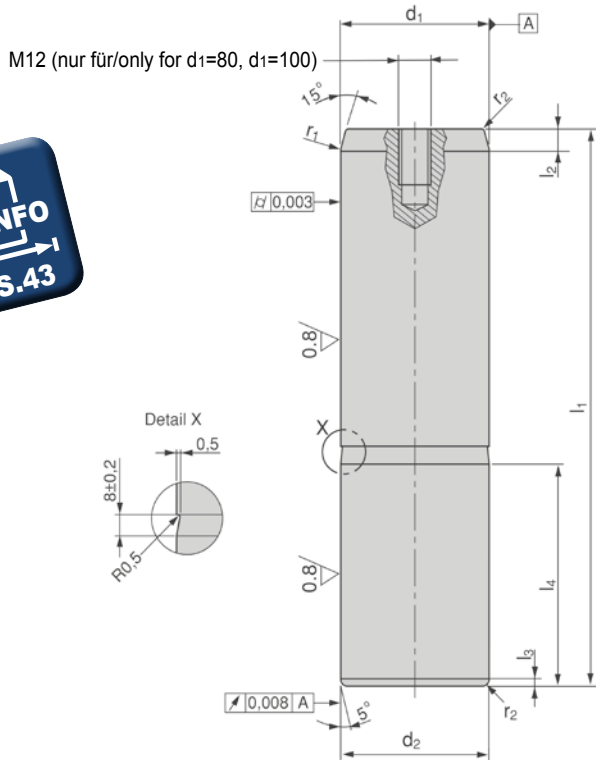
[FS]

FS 410

Mat.: Stahl  
Oberflächenhärte: 60 - 64 HRC  
Einhärtungstiefe: 1,5 + 1 mm

Mat.: steel  
Surface hardness: 60 - 64 HRC  
Hardening depth: 1,5 + 1 mm

FS 410 / 50 x 200




| d1  | l1 |     |     |     |     |     |     |     |     |     |     |     | l2 | l3 | l4 | d2  | r1  | r2 |     |
|-----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|-----|-----|----|-----|
|     | f6 | 125 | 140 | 160 | 180 | 200 | 224 | 250 | 280 | 315 | 355 | 400 |    |    |    |     |     |    | 450 |
| 25  | •  | •   | •   | •   | •   | •   |     |     |     |     |     |     |    | 8  | 4  | 40  | 25  | 3  | 2   |
| 32  |    | •   | •   | •   | •   | •   | •   |     |     |     |     |     |    | 8  | 4  | 45  | 32  | 3  | 2   |
| 40  |    | •   | •   | •   | •   | •   | •   | •   |     |     |     |     |    | 8  | 4  | 56  | 40  | 3  | 2   |
| 50  |    |     | •   | •   | •   | •   | •   | •   | •   | •   |     |     |    | 10 | 4  | 70  | 50  | 5  | 2,5 |
| 63  |    |     |     | •   | •   | •   | •   | •   | •   | •   | •   |     |    | 10 | 4  | 80  | 63  | 6  | 2,5 |
| 80  |    |     |     |     | •   | •   | •   | •   | •   | •   | •   | •   |    | 10 | 4  | 100 | 80  | 8  | 3   |
| 100 |    |     |     |     |     | •   | •   | •   | •   | •   | •   | •   |    | 10 | 4  | 125 | 100 | 10 | 3   |

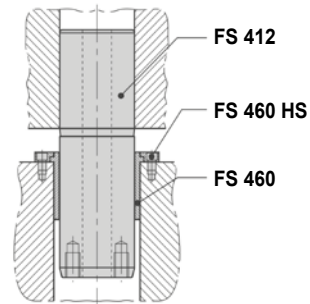
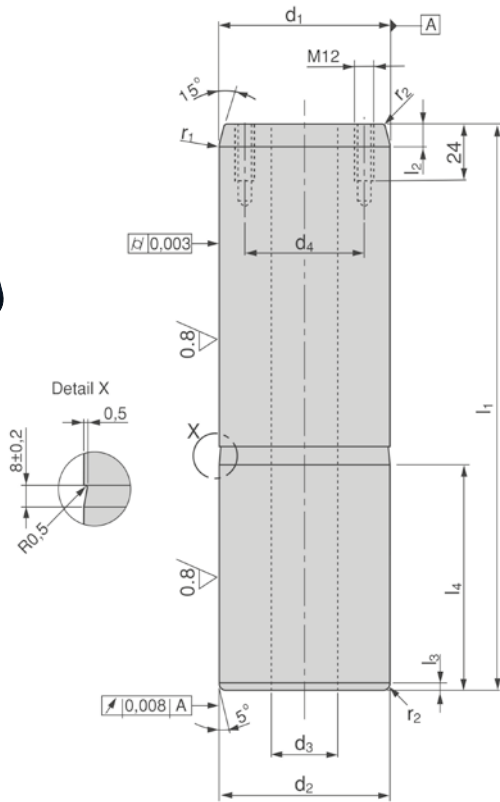


FS 412

Mat.: Stahl  
Oberflächenhärte: 60 - 64 HRC  
Einhärtungstiefe: 1,5 + 1 mm

Mat.: steel  
Surface hardness: 60 - 64 HRC  
Hardening depth: 1,5 + 1 mm

 FS 412 / 50 x 200



| d1  | l1  |     |     |     |     |     |     |     |     |     | l2   | l3   | l4   | d2  | d3 | d4   | r1 | r2 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|-----|----|------|----|----|
| f6  | 200 | 224 | 250 | 280 | 315 | 355 | 400 | 450 | 500 | 560 | +0,8 | +0,8 | +0,8 | r6  | ±2 | +0,8 |    |    |
| 80  | •   | •   | •   | •   | •   | •   | •   | •   |     |     | 10   | 4    | 100  | 80  | 40 | 58   | 8  | 3  |
| 100 |     | •   | •   | •   | •   | •   | •   | •   |     |     | 10   | 4    | 125  | 100 | 50 | 72   | 10 | 3  |
| 125 |     |     |     |     | •   | •   | •   | •   | •   |     | 12   | 4    | 140  | 125 | 65 | 90   | 12 | 4  |
| 160 |     |     |     |     |     |     | •   | •   | •   | •   | 12   | 5    | 180  | 160 | 95 | 132  | 18 | 4  |

[FS]



mit langem Bund/long-headed style

**FS 440 ... RM**  
**FS 450 ... RM**



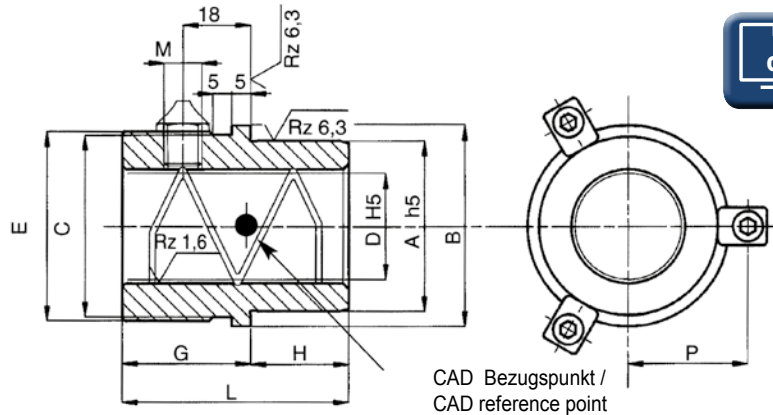
Mat.: 1.6757 / 61 - 63 HRC  
RM-beschichtet (selbstschmierend)

Lieferumfang:  
• 3 Halteklammern mit Schrauben

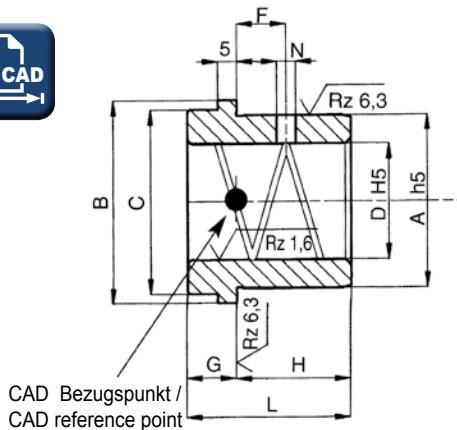
Mat.: 1.6757 / 61 - 63 HRC  
RM-coated (self lubricating)

Included:  
• 3 holding clamps with screws

**FS 450 / 40 x 90 / RM**



CAD Bezugspunkt /  
CAD reference point



CAD Bezugspunkt /  
CAD reference point

mit kurzem Bund/short-headed style

**FS 430 ... RM**  
**FS 439 ... RM**



| D     | A  | B  | C  | Artikelnummer<br>Article number | E  | F  | G  | H  | L   | M       | N | P    | Aufnahmebohrung<br>Mounting hole<br>H6 |
|-------|----|----|----|---------------------------------|----|----|----|----|-----|---------|---|------|--|
| 18-19 | 28 | 34 | 29 | FS 430 ... RM                   | -  | 8  | 13 | 18 | 31  | -       | 5 | 20,5 | 28 <sup>+0,013</sup>                   |
| 18-19 | 28 | 34 | 29 | FS 439 ... RM                   | -  | 8  | 13 | 37 | 50  | -       | 5 | 20,5 | 28 <sup>+0,013</sup>                   |
| 18-19 | 28 | 34 | 29 | FS 440 ... RM                   | 31 | -  | 32 | 18 | 50  | M6      | - | 20,5 | 28 <sup>+0,013</sup>                   |
| 18-19 | 28 | 34 | 29 | FS 450 ... RM                   | 31 | -  | 33 | 27 | 60  | M6      | - | 20,5 | 28 <sup>+0,013</sup>                   |
| 24-25 | 38 | 44 | 39 | FS 430 ... RM                   | -  | 9  | 13 | 23 | 36  | -       | 5 | 25,5 | 38 <sup>+0,016</sup>                   |
| 24-25 | 38 | 44 | 39 | FS 439 ... RM                   | -  | 12 | 13 | 42 | 55  | -       | 5 | 25,5 | 38 <sup>+0,016</sup>                   |
| 24-25 | 38 | 44 | 39 | FS 440 ... RM                   | 41 | -  | 32 | 23 | 55  | M10 x 1 | - | 25,5 | 38 <sup>+0,016</sup>                   |
| 24-25 | 38 | 44 | 39 | FS 450 ... RM                   | 41 | -  | 38 | 32 | 70  | M10 x 1 | - | 25,5 | 38 <sup>+0,016</sup>                   |
| 30-32 | 45 | 53 | 48 | FS 430 ... RM                   | -  | 11 | 13 | 30 | 43  | -       | 5 | 31,5 | 45 <sup>+0,016</sup>                   |
| 30-32 | 45 | 53 | 48 | FS 439 ... RM                   | -  | 19 | 13 | 47 | 60  | -       | 5 | 31,5 | 45 <sup>+0,016</sup>                   |
| 30-32 | 45 | 53 | 48 | FS 440 ... RM                   | 50 | -  | 34 | 26 | 60  | M10 x 1 | - | 31,5 | 45 <sup>+0,016</sup>                   |
| 30-32 | 45 | 53 | 48 | FS 450 ... RM                   | 50 | -  | 43 | 37 | 80  | M10 x 1 | - | 31,5 | 45 <sup>+0,016</sup>                   |
| 40-42 | 54 | 63 | 58 | FS 430 ... RM                   | -  | 11 | 13 | 38 | 51  | -       | 8 | 36,5 | 54 <sup>+0,019</sup>                   |
| 40-42 | 54 | 63 | 58 | FS 439 ... RM                   | -  | 19 | 13 | 54 | 67  | -       | 8 | 36,5 | 54 <sup>+0,019</sup>                   |
| 40-42 | 54 | 63 | 58 | FS 440 ... RM                   | 60 | -  | 37 | 30 | 67  | M10 x 1 | - | 36,5 | 54 <sup>+0,019</sup>                   |
| 40-42 | 54 | 63 | 58 | FS 450 ... RM                   | 60 | -  | 43 | 47 | 90  | M10 x 1 | - | 36,5 | 54 <sup>+0,019</sup>                   |
| 50-52 | 65 | 79 | 74 | FS 430 ... RM                   | -  | 14 | 13 | 48 | 61  | -       | 8 | 44,5 | 65 <sup>+0,019</sup>                   |
| 50-52 | 65 | 79 | 74 | FS 439 ... RM                   | -  | 19 | 13 | 62 | 75  | -       | 8 | 44,5 | 65 <sup>+0,019</sup>                   |
| 50-52 | 65 | 79 | 74 | FS 440 ... RM                   | 76 | -  | 40 | 35 | 75  | M10 x 1 | - | 44,5 | 65 <sup>+0,019</sup>                   |
| 50-52 | 65 | 79 | 74 | FS 450 ... RM                   | 76 | -  | 43 | 57 | 100 | M10 x 1 | - | 44,5 | 65 <sup>+0,019</sup>                   |





# Führungsbuchsen mit Bund, Stahlführung

## Leader pin bushings with collar, steel



FÜHRUNGSSYSTEME / GUIDINGSYSTEMS

mit langem Bund/long-headed style

**FS 741**  
**FS 751**  
**FS 755**

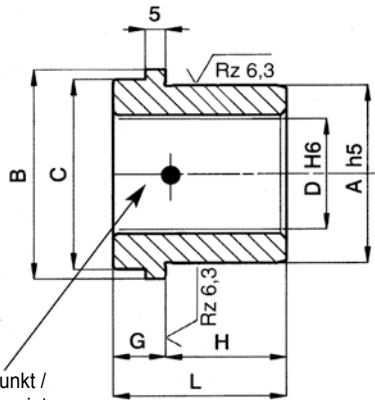
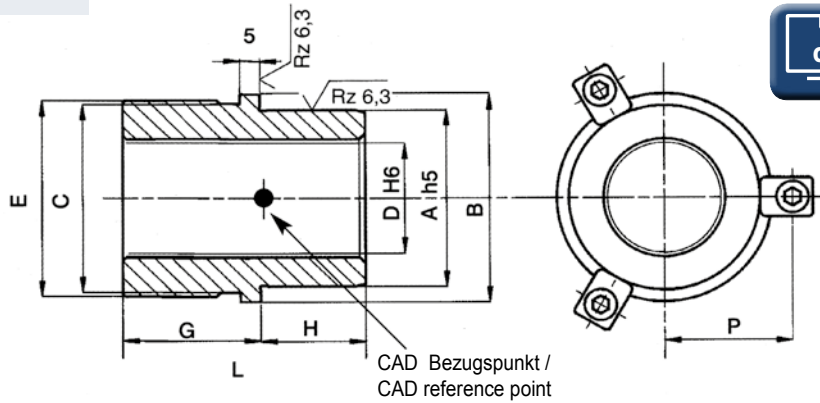
Mat.: Stahl 61 - 63 HRC  
Sinter: 40 - 50 HRC

Lieferumfang:  
• 3 Halteklammern mit Schrauben

Mat.: Steel 61 - 63 HRC  
Sinter: 40 - 50 HRC

Included:  
• 3 holding clamps with screws

**FS 751 / 30 x 90**



CAD Bezugspunkt /  
CAD reference point

mit kurzem Bund/short-headed style

**FS 731**  
**FS 732**



| D     | A  | B  | C  | Artikelnummer<br>Article number | E  | G  | H  | L   | P    | Aufnahmebohrung<br>Mounting hole<br>H6 |
|-------|----|----|----|---------------------------------|----|----|----|-----|------|--|
| 18-19 | 28 | 34 | 29 | FS 731                          | -  | 13 | 18 | 31  | 20,5 | 28+0,013                               |
| 18-19 | 28 | 34 | 29 | FS 732                          | -  | 13 | 37 | 50  | 20,5 | 28+0,013                               |
| 18-19 | 28 | 34 | 29 | FS 741                          | 31 | 32 | 18 | 50  | 20,5 | 28+0,013                               |
| 18-19 | 28 | 34 | 29 | FS 751                          | 31 | 43 | 27 | 70  | 20,5 | 28+0,013                               |
| 18-19 | 28 | 34 | 29 | FS 755                          | 31 | 52 | 18 | 70  | 20,5 | 28+0,013                               |
| 24-25 | 38 | 44 | 39 | FS 731                          | -  | 13 | 23 | 36  | 25,5 | 38+0,016                               |
| 24-25 | 38 | 44 | 39 | FS 732                          | -  | 13 | 42 | 55  | 25,5 | 38+0,016                               |
| 24-25 | 38 | 44 | 39 | FS 741                          | 41 | 32 | 23 | 55  | 25,5 | 38+0,016                               |
| 24-25 | 38 | 44 | 39 | FS 751                          | 41 | 48 | 32 | 80  | 25,5 | 38+0,016                               |
| 24-25 | 38 | 44 | 39 | FS 755                          | 41 | 57 | 23 | 80  | 25,5 | 38+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 731                          | -  | 13 | 30 | 43  | 31,5 | 45+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 732                          | -  | 13 | 47 | 60  | 31,5 | 45+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 741                          | 50 | 34 | 26 | 60  | 31,5 | 45+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 751                          | 50 | 53 | 37 | 90  | 31,5 | 45+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 755                          | 50 | 64 | 26 | 90  | 31,5 | 45+0,016                               |
| 40-42 | 54 | 63 | 58 | FS 731                          | -  | 13 | 38 | 51  | 36,5 | 54+0,019                               |
| 40-42 | 54 | 63 | 58 | FS 732                          | -  | 13 | 54 | 67  | 36,5 | 54+0,019                               |
| 40-42 | 54 | 63 | 58 | FS 741                          | 60 | 37 | 30 | 67  | 36,5 | 54+0,019                               |
| 40-42 | 54 | 63 | 58 | FS 751                          | 60 | 53 | 47 | 100 | 36,5 | 54+0,019                               |
| 40-42 | 54 | 63 | 58 | FS 755                          | 60 | 70 | 30 | 100 | 36,5 | 54+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 731                          | -  | 13 | 48 | 61  | 44,5 | 65+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 732                          | -  | 13 | 62 | 75  | 44,5 | 65+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 741                          | 76 | 40 | 35 | 75  | 44,5 | 65+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 751                          | 76 | 53 | 57 | 110 | 44,5 | 65+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 755                          | 76 | 75 | 35 | 110 | 44,5 | 65+0,019                               |

mit langem Bund/long-headed style

**FS 741**

**FS 751**

**FS 755**

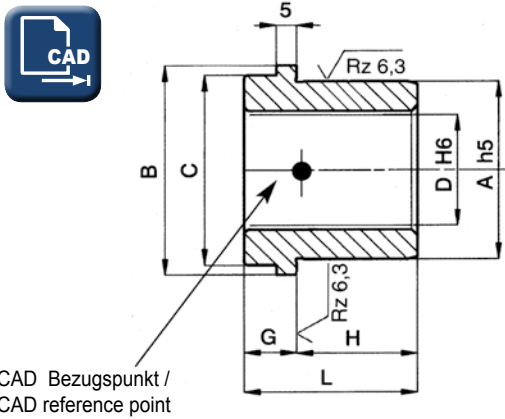
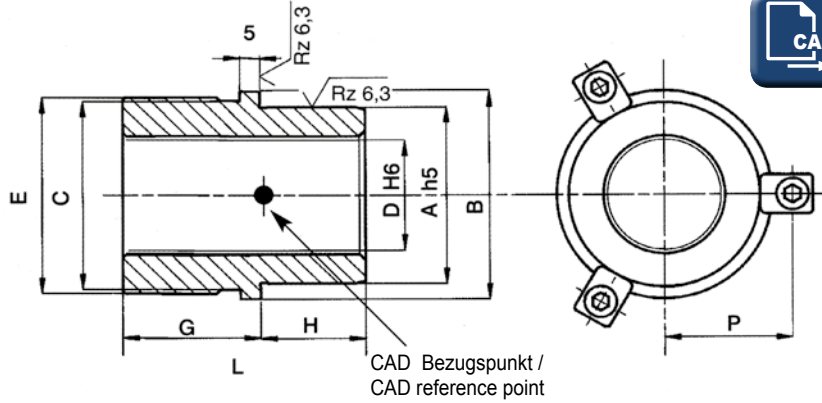
Mat.: Stahl 61 - 63 HRC  
Sinter: 40 - 50 HRC

Lieferumfang:  
• 3 Halteklammern mit Schrauben

Mat.: Steel 61 - 63 HRC  
Sinter: 40 - 50 HRC

Included:  
• 3 holding clamps with screws

**FS 751 / 63 x 130**



mit kurzem Bund/short-headed style

**FS 731**

**FS 732**

| D  | A   | B   | C   | Artikelnummer<br>Article number | E   | G   | H  | L          | P    | Aufnahmebohrung<br>Mounting hole<br>H6 |
|----|-----|-----|-----|---------------------------------|-----|-----|----|------------|------|--|
| 63 | 81  | 92  | 87  | <b>FS 731</b>                   | –   | 13  | 61 | <b>74</b>  | 51   | 81 <sup>+0,022</sup>                   |
| 63 | 81  | 92  | 87  | <b>FS 732</b>                   | –   | 13  | 77 | <b>90</b>  | 51   | 81 <sup>+0,022</sup>                   |
| 63 | 81  | 92  | 87  | <b>FS 741</b>                   | 89  | 42  | 48 | <b>90</b>  | 51   | 81 <sup>+0,022</sup>                   |
| 63 | 81  | 92  | 87  | <b>FS 751</b>                   | 89  | 63  | 67 | <b>130</b> | 51   | 81 <sup>+0,022</sup>                   |
| 63 | 81  | 92  | 87  | <b>FS 755</b>                   | 89  | 82  | 48 | <b>130</b> | 51   | 81 <sup>+0,022</sup>                   |
| 80 | 100 | 111 | 106 | <b>FS 731</b>                   | –   | 13  | 78 | <b>91</b>  | 60,5 | 100 <sup>+0,022</sup>                  |
| 80 | 100 | 111 | 106 | <b>FS 741</b>                   | 108 | 52  | 48 | <b>100</b> | 60,5 | 100 <sup>+0,022</sup>                  |
| 80 | 100 | 111 | 106 | <b>FS 751</b>                   | 108 | 73  | 77 | <b>150</b> | 60,5 | 100 <sup>+0,022</sup>                  |
| 80 | 100 | 111 | 106 | <b>FS 755</b>                   | 108 | 102 | 48 | <b>150</b> | 60,5 | 100 <sup>+0,022</sup>                  |

# Führungsbuchsen mit Bund, Bronze beschichtet

## Leader pin bushings with collar, bronze plated



FÜHRUNGSSYSTEME / GUIDINGSYSTEMS

mit langem Bund/long-headed style

**FS 641**

**FS 651**

**FS 655**

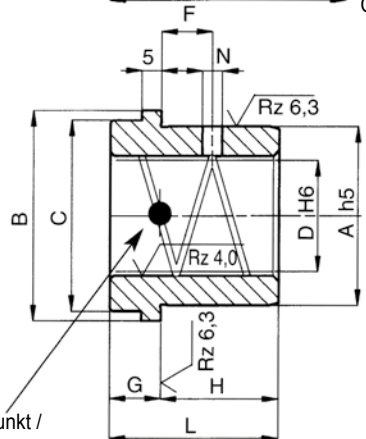
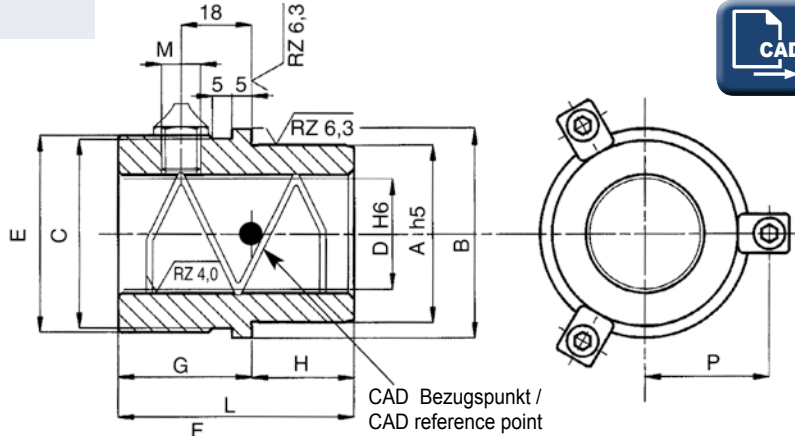
Mat.: 1.6757 / 61 - 63 HRC  
Bronze: 40 - 45 HRC

Lieferumfang:  
• 3 Halteklammern mit Schrauben

Mat.: 1.6757 / 61 - 63 HRC  
Bronze: 40 - 45 HRC

Included:  
• 3 holding clamps with screws

**FS 651 / 30 x 90**



mit kurzem Bund/short-headed style  
**FS 631**  
**FS 632**

CAD Bezugspunkt /  
CAD reference point



| D     | A  | B  | C  | Artikelnummer<br>Article number | E  | F  | G  | H  | L   | M       | N | P    | Aufnahmebohrung<br>Mounting hole<br>H6 |
|-------|----|----|----|---------------------------------|----|----|----|----|-----|---------|---|------|--|
| 18-19 | 28 | 34 | 29 | FS 631                          | -  | 8  | 13 | 18 | 31  | -       | 5 | 20,5 | 28+0,013                               |
| 18-19 | 28 | 34 | 29 | FS 632                          | -  | 8  | 13 | 37 | 50  | -       | 5 | 20,5 | 28+0,013                               |
| 18-19 | 28 | 34 | 29 | FS 641                          | 31 | -  | 32 | 18 | 50  | M6      | - | 20,5 | 28+0,013                               |
| 18-19 | 28 | 34 | 29 | FS 651                          | 31 | -  | 43 | 27 | 70  | M6      | - | 20,5 | 28+0,013                               |
| 18-19 | 28 | 34 | 29 | FS 655                          | 31 | -  | 52 | 18 | 70  | M6      | - | 20,5 | 28+0,013                               |
| 24-25 | 38 | 44 | 39 | FS 631                          | -  | 12 | 13 | 23 | 36  | -       | 5 | 25,5 | 38+0,016                               |
| 24-25 | 38 | 44 | 39 | FS 632                          | -  | 12 | 13 | 42 | 55  | -       | 5 | 25,5 | 38+0,016                               |
| 24-25 | 38 | 44 | 39 | FS 641                          | 41 | -  | 32 | 23 | 55  | M10 x 1 | - | 25,5 | 38+0,016                               |
| 24-25 | 38 | 44 | 39 | FS 651                          | 41 | -  | 48 | 32 | 80  | M10 x 1 | - | 25,5 | 38+0,016                               |
| 24-25 | 38 | 44 | 39 | FS 655                          | 41 | -  | 57 | 23 | 80  | M10 x 1 | - | 25,5 | 38+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 631                          | -  | 16 | 13 | 30 | 43  | -       | 5 | 31,5 | 45+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 632                          | -  | 16 | 13 | 47 | 60  | -       | 5 | 31,5 | 45+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 641                          | 50 | -  | 34 | 26 | 60  | M10 x 1 | - | 31,5 | 45+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 651                          | 50 | -  | 53 | 37 | 90  | M10 x 1 | - | 31,5 | 45+0,016                               |
| 30-32 | 45 | 53 | 48 | FS 655                          | 50 | -  | 64 | 26 | 90  | M10 x 1 | - | 31,5 | 45+0,016                               |
| 40-42 | 54 | 63 | 58 | FS 631                          | -  | 19 | 13 | 38 | 51  | -       | 8 | 36,5 | 54+0,019                               |
| 40-42 | 54 | 63 | 58 | FS 632                          | -  | 19 | 13 | 54 | 67  | -       | 8 | 36,5 | 54+0,019                               |
| 40-42 | 54 | 63 | 58 | FS 641                          | 60 | -  | 37 | 30 | 67  | M10 x 1 | - | 36,5 | 54+0,019                               |
| 40-42 | 54 | 63 | 58 | FS 651                          | 60 | -  | 53 | 47 | 100 | M10 x 1 | - | 36,5 | 54+0,019                               |
| 40-42 | 54 | 63 | 58 | FS 655                          | 60 | -  | 70 | 30 | 100 | M10 x 1 | - | 36,5 | 54+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 631                          | -  | 19 | 13 | 48 | 61  | -       | 8 | 44,5 | 65+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 632                          | -  | 19 | 13 | 62 | 75  | -       | 8 | 44,5 | 65+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 641                          | 76 | -  | 40 | 35 | 75  | M10 x 1 | - | 44,5 | 65+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 651                          | 76 | -  | 53 | 57 | 110 | M10 x 1 | - | 44,5 | 65+0,019                               |
| 50-52 | 65 | 79 | 74 | FS 655                          | 76 | -  | 75 | 35 | 110 | M10 x 1 | - | 44,5 | 65+0,019                               |



[03.12.2018]



[FS]

mit langem Bund/long-headed style

**FS 641**

**FS 651**

**FS 655**

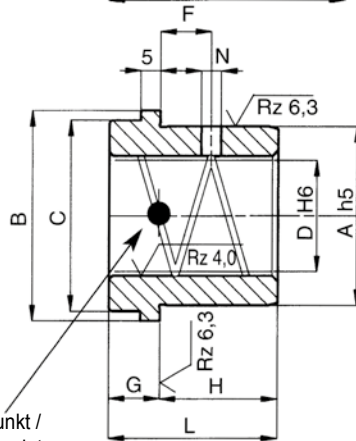
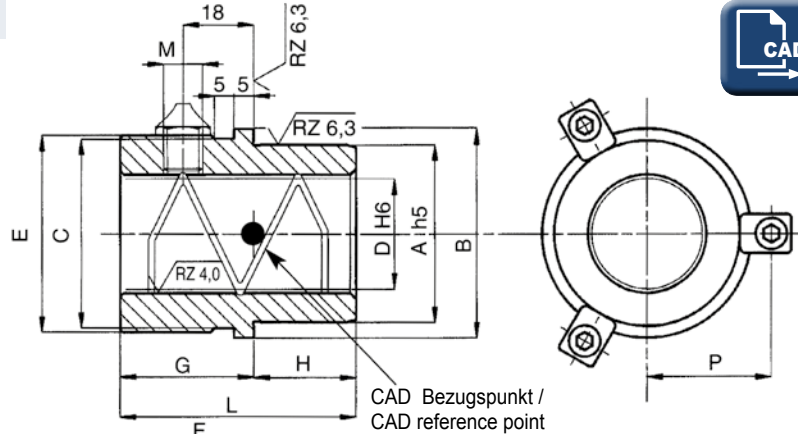
Mat.: 1.6757 / 61 - 63 HRC  
Bronze: 40 - 45 HRC

Lieferumfang:  
• 3 Halteklammern mit Schrauben

Mat.: 1.6757 / 61 - 63 HRC  
Bronze: 40 - 45 HRC

Included:  
• 3 holding clamps with screws

**FS 651 / 63 x 130**



CAD Bezugspunkt /  
CAD reference point

mit kurzem Bund/short-headed style

**FS 631**

**FS 632**



| D  | A   | B   | C   | Artikelnummer<br>Article number | E   | F  | G   | H  | L          | M       | N | P    | Aufnahmebohrung<br>Mounting hole<br>H6 |
|----|-----|-----|-----|---------------------------------|-----|----|-----|----|------------|---------|---|------|--|
| 63 | 81  | 92  | 87  | <b>FS 631</b>                   | -   | 19 | 13  | 61 | <b>74</b>  | -       | 8 | 51   | 81 <sup>+0,022</sup>                   |
| 63 | 81  | 92  | 87  | <b>FS 632</b>                   | -   | 19 | 13  | 77 | <b>90</b>  | -       | 8 | 51   | 81 <sup>+0,022</sup>                   |
| 63 | 81  | 92  | 87  | <b>FS 641</b>                   | 89  | -  | 42  | 48 | <b>90</b>  | M10 x 1 | - | 51   | 81 <sup>+0,022</sup>                   |
| 63 | 81  | 92  | 87  | <b>FS 651</b>                   | 89  | -  | 63  | 67 | <b>130</b> | M10 x 1 | - | 51   | 81 <sup>+0,022</sup>                   |
| 63 | 81  | 92  | 87  | <b>FS 655</b>                   | 89  | -  | 82  | 48 | <b>130</b> | M10 x 1 | - | 51   | 81 <sup>+0,022</sup>                   |
| 80 | 100 | 111 | 106 | <b>FS 631</b>                   | -   | 19 | 13  | 78 | <b>91</b>  | -       | 8 | 60,5 | 100 <sup>+0,022</sup>                  |
| 80 | 100 | 111 | 106 | <b>FS 641</b>                   | 108 | -  | 52  | 48 | <b>100</b> | -       | 8 | 60,5 | 100 <sup>+0,022</sup>                  |
| 80 | 100 | 111 | 106 | <b>FS 651</b>                   | 108 | -  | 73  | 77 | <b>150</b> | M10 x 1 | - | 60,5 | 100 <sup>+0,022</sup>                  |
| 80 | 100 | 111 | 106 | <b>FS 655</b>                   | 108 | -  | 102 | 48 | <b>150</b> | M10 x 1 | - | 60,5 | 100 <sup>+0,022</sup>                  |

**FS 457**  
**FS 458**  
**FS 453**

Mat.: 1.6757 / 61 - 63 HRC

Mat.: 1.6757 / 61 - 63 HRC

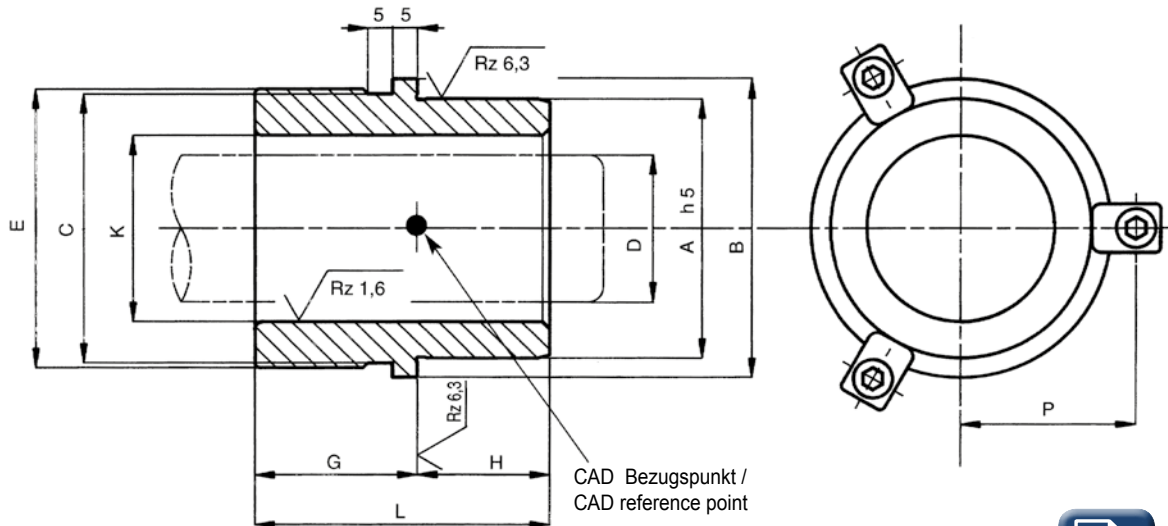
**FS 453 / 30 x 90**

Lieferumfang:

- 3 Halteklammern mit Schrauben

Included:

- 3 holding clamps with screws



| D     | K     | A  | B  | C  | Artikelnummer<br>Article number | E  | G  | H  | L          | P    | Aufnahmebohrung<br>Mounting hole<br>H6 |
|-------|-------|----|----|----|---------------------------------|----|----|----|------------|------|--|
| 18-19 | 24-25 | 34 | 40 | 34 | <b>FS 457</b>                   | –  | 13 | 18 | <b>31</b>  | 23,5 | 34 <sup>+0,013</sup>                   |
| 18-19 | 24-25 | 34 | 40 | 34 | <b>FS 458</b>                   | 36 | 32 | 18 | <b>50</b>  | 23,5 | 34 <sup>+0,013</sup>                   |
| 18-19 | 24-25 | 34 | 40 | 34 | <b>FS 453</b>                   | 36 | 43 | 27 | <b>70</b>  | 23,5 | 34 <sup>+0,013</sup>                   |
| 24-25 | 30-31 | 44 | 50 | 44 | <b>FS 457</b>                   | –  | 13 | 22 | <b>35</b>  | 28,5 | 44 <sup>+0,016</sup>                   |
| 24-25 | 30-31 | 44 | 50 | 44 | <b>FS 458</b>                   | 46 | 33 | 22 | <b>55</b>  | 28,5 | 44 <sup>+0,016</sup>                   |
| 24-25 | 30-31 | 44 | 50 | 44 | <b>FS 453</b>                   | 46 | 48 | 32 | <b>80</b>  | 28,5 | 44 <sup>+0,016</sup>                   |
| 30-32 | 38-40 | 53 | 61 | 55 | <b>FS 457</b>                   | –  | 13 | 27 | <b>40</b>  | 35,5 | 53 <sup>+0,016</sup>                   |
| 30-32 | 38-40 | 53 | 61 | 55 | <b>FS 458</b>                   | 57 | 33 | 27 | <b>60</b>  | 35,5 | 53 <sup>+0,016</sup>                   |
| 30-32 | 38-40 | 53 | 61 | 55 | <b>FS 453</b>                   | 57 | 53 | 37 | <b>90</b>  | 35,5 | 53 <sup>+0,016</sup>                   |
| 40-42 | 48-50 | 62 | 71 | 65 | <b>FS 457</b>                   | –  | 13 | 32 | <b>45</b>  | 40,5 | 62 <sup>+0,019</sup>                   |
| 40-42 | 48-50 | 62 | 71 | 65 | <b>FS 458</b>                   | 67 | 40 | 27 | <b>67</b>  | 40,5 | 62 <sup>+0,019</sup>                   |
| 40-42 | 48-50 | 62 | 71 | 65 | <b>FS 453</b>                   | 67 | 53 | 47 | <b>100</b> | 40,5 | 62 <sup>+0,019</sup>                   |
| 50-52 | 58-60 | 73 | 87 | 81 | <b>FS 457</b>                   | –  | 13 | 37 | <b>50</b>  | 48,5 | 73 <sup>+0,019</sup>                   |
| 50-52 | 58-60 | 73 | 87 | 81 | <b>FS 458</b>                   | 83 | 43 | 32 | <b>75</b>  | 48,5 | 73 <sup>+0,019</sup>                   |
| 50-52 | 58-60 | 73 | 87 | 81 | <b>FS 453</b>                   | 83 | 53 | 57 | <b>110</b> | 48,5 | 73 <sup>+0,019</sup>                   |

ØD = 63 und 80 auf Anfrage / ØD = 63 and 80 on request

[FS]

### FS 425

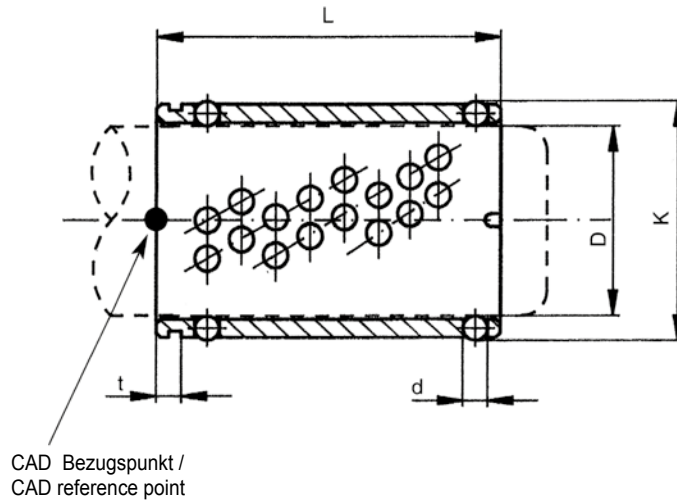
Mat.: Messing  
Stahlkugeln: Güteklasse AAA

Mat.: Brass  
Steel balls, grade AAA

FS 425 / 25 x 90

Sicherungsring im Lieferumfang  
enthalten.

Safety ring included



| D  | K  | d | t   | L   | Anzahl Kugeln<br>Number of balls |
|----|----|---|-----|-----|----------------------------------|
| 18 | 24 | 3 | 2,9 | 45  | 144                              |
|    |    |   |     | 56  | 176                              |
|    |    |   |     | 71  | 224                              |
| 19 | 25 | 3 | 2,9 | 80  | 272                              |
|    |    |   |     | 45  | 171                              |
| 24 | 30 | 3 | 3,6 | 71  | 285                              |
|    |    |   |     | 90  | 361                              |
|    |    |   |     | 56  | 160                              |
| 25 | 31 | 3 | 3,6 | 75  | 228                              |
|    |    |   |     | 95  | 300                              |
|    |    |   |     | 105 | 340                              |
| 30 | 38 | 4 | 4,8 | 63  | 230                              |
|    |    |   |     | 80  | 299                              |
|    |    |   |     | 120 | 460                              |
| 32 | 40 | 4 | 4,8 | 80  | 336                              |
|    |    |   |     | 95  | 405                              |
| 40 | 48 | 4 | 4,8 | 140 | 616                              |
|    |    |   |     | 80  | 336                              |
|    |    |   |     | 95  | 405                              |
| 42 | 50 | 4 | 4,8 | 80  | 336                              |
|    |    |   |     | 95  | 405                              |
| 50 | 58 | 4 | 5,5 | 80  | 336                              |
|    |    |   |     | 95  | 405                              |
| 52 | 60 | 4 | 5,5 | 80  | 336                              |
|    |    |   |     | 95  | 405                              |

ØD = 63 und 80 auf Anfrage / ØD = 63 and 80 on request



### FS 424

Mat.: Aluminium  
Stahlkugeln: Güteklasse AAA

Mat.: Aluminium  
Steel balls, grade AAA

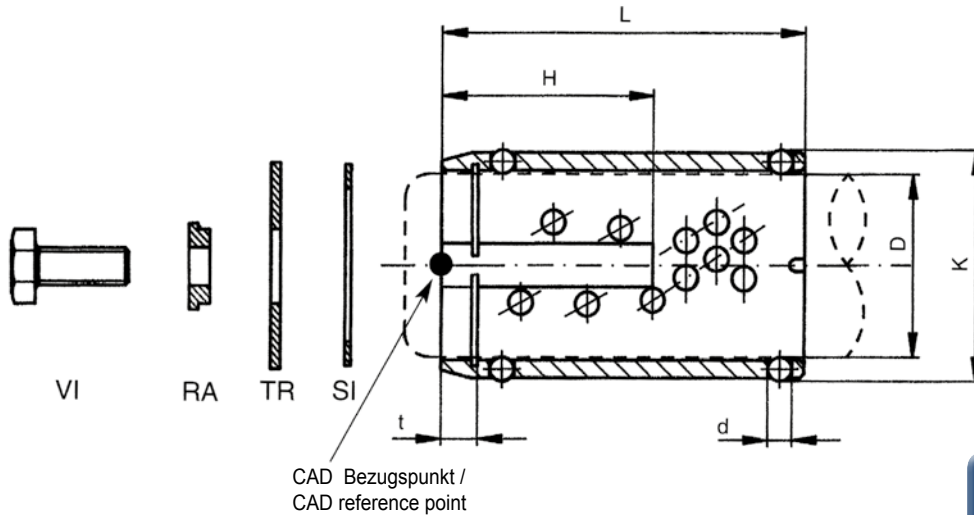
**FS 424 / 32 x 105**

Jeder Kugelkäfig wird mit Befestigungselementen (siehe Seite FS.20/21) geliefert.

Each ball cage supplied with mounting elements (please see page FS.20/21).

**Kugelkäfige vorzugsweise für den Einbau im Unterteil.**

**Ball cages, preferably for mounting in the lower half of the die.**



| D  | K  | d | t | H  | L   | Anzahl Kugeln<br>Number of balls |
|----|----|---|---|----|-----|----------------------------------|
| 18 | 24 | 3 | 4 | 24 | 44  | 66                               |
| 18 | 24 | 3 | 4 | 36 | 60  | 93                               |
| 18 | 24 | 3 | 4 | 44 | 80  | 141                              |
| 19 | 25 | 3 | 4 | 24 | 44  | 66                               |
| 19 | 25 | 3 | 4 | 36 | 60  | 93                               |
| 19 | 25 | 3 | 4 | 44 | 80  | 141                              |
| 24 | 30 | 3 | 4 | 32 | 52  | 100                              |
| 24 | 30 | 3 | 4 | 40 | 72  | 149                              |
| 24 | 30 | 3 | 4 | 48 | 92  | 198                              |
| 25 | 31 | 3 | 4 | 32 | 52  | 100                              |
| 25 | 31 | 3 | 4 | 40 | 72  | 149                              |
| 25 | 31 | 3 | 4 | 48 | 92  | 198                              |
| 30 | 38 | 4 | 5 | 35 | 60  | 112                              |
| 30 | 38 | 4 | 5 | 45 | 75  | 145                              |
| 30 | 38 | 4 | 5 | 55 | 105 | 204                              |
| 32 | 40 | 4 | 5 | 35 | 60  | 112                              |
| 32 | 40 | 4 | 5 | 45 | 75  | 145                              |
| 32 | 40 | 4 | 5 | 55 | 105 | 204                              |



[FS]

### FS 424

Mat.: Aluminium  
Stahlkugeln: Güteklasse AAA

Mat.: Aluminium  
Steel balls, grade AAA

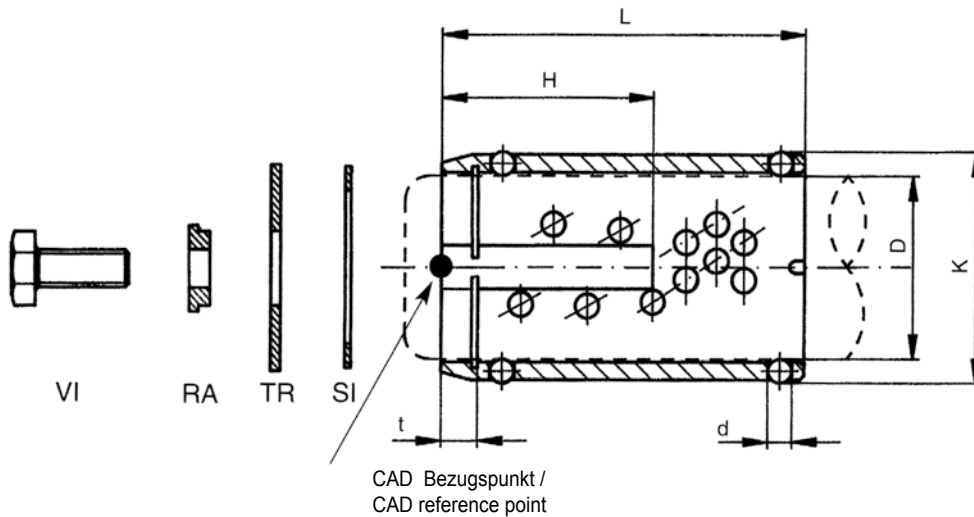
**FS 424 / 52 x 105**

Jeder Kugelkäfig wird mit Befestigungselementen (siehe Seite FS.20/21) geliefert.

Each ball cage supplied with mounting elements (please see page FS.20/21).

**Kugelkäfige vorzugsweise für den Einbau im Unterteil.**

**Ball cages, preferably for mounting in the lower half of the die.**




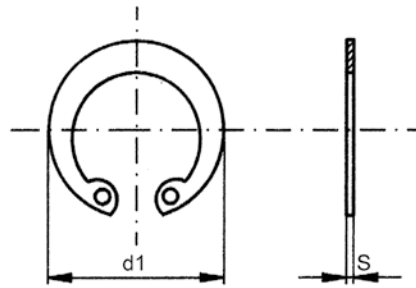
| D  | K  | d | t | H  | L   | Anzahl Kugeln<br>Number of balls |
|----|----|---|---|----|-----|----------------------------------|
| 40 | 48 | 4 | 5 | 40 | 70  | 159                              |
| 40 | 48 | 4 | 5 | 50 | 85  | 198                              |
| 40 | 48 | 4 | 5 | 75 | 120 | 288                              |
| 42 | 50 | 4 | 5 | 40 | 70  | 159                              |
| 42 | 50 | 4 | 5 | 50 | 85  | 198                              |
| 42 | 50 | 4 | 5 | 75 | 120 | 288                              |
| 50 | 58 | 4 | 5 | 45 | 90  | 245                              |
| 50 | 58 | 4 | 5 | 55 | 105 | 293                              |
| 50 | 58 | 4 | 5 | 80 | 130 | 363                              |
| 52 | 60 | 4 | 5 | 45 | 90  | 245                              |
| 52 | 60 | 4 | 5 | 55 | 105 | 293                              |
| 52 | 60 | 4 | 5 | 80 | 130 | 363                              |





FS 424 / SI

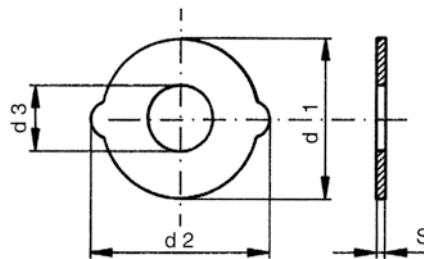
 FS 424 / SI 1



| Größe<br>Size | D<br>FS 424 | d1 | S    |
|---------------|-------------|----|------|
| SI 1          | 18          | 19 | 1    |
| SI 2          | 19          | 20 | 1    |
| SI 3          | 24          | 25 | 1,2  |
| SI 4          | 25          | 26 | 1,2  |
| SI 5          | 30          | 31 | 1,2  |
| SI 6          | 32          | 33 | 1,2  |
| SI 7          | 40          | 41 | 1,75 |
| SI 8          | 42          | 43 | 1,75 |
| SI 9          | 50          | 51 | 2    |
| SI 10         | 52          | 53 | 2    |

FS 424 / TR

 FS 424 / TR 1



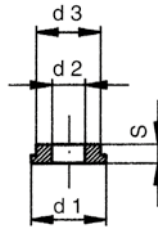
| Größe<br>Size | D<br>FS 424 | d1   | d2   | d3 | S   |
|---------------|-------------|------|------|----|-----|
| TR 1          | 18          | 17,5 | 20,8 | 12 | 1,5 |
| TR 2          | 19          | 18,5 | 21,8 | 12 | 1,5 |
| TR 3          | 24          | 23,5 | 26,8 | 12 | 1,5 |
| TR 4          | 25          | 24,5 | 27,8 | 12 | 1,5 |
| TR 5          | 30          | 29,5 | 34,2 | 12 | 1,5 |
| TR 6          | 32          | 31,5 | 36,2 | 12 | 1,5 |
| TR 7          | 40          | 39,5 | 44,2 | 15 | 2   |
| TR 8          | 42          | 41,5 | 46,2 | 15 | 2   |
| TR 9          | 50          | 49,5 | 54,2 | 15 | 2   |
| TR 10         | 52          | 51,5 | 56,5 | 15 | 2   |

[FS]



FS 424 / RA

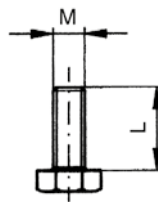
FS 424 / RA 1



| Größe<br>Size | D<br>FS 424 | d1 | d2  | d3   | S   |
|---------------|-------------|----|-----|------|-----|
| RA 1          | 18          | 14 | 6,3 | 11,8 | 3,5 |
| RA 1          | 19          | 14 | 6,3 | 11,8 | 3,5 |
| RA 1          | 24          | 14 | 6,3 | 11,8 | 3,5 |
| RA 1          | 25          | 14 | 6,3 | 11,8 | 3,5 |
| RA 1          | 30          | 14 | 6,3 | 11,8 | 3,5 |
| RA 1          | 32          | 14 | 6,3 | 11,8 | 3,5 |
| RA 2          | 40          | 18 | 8,3 | 14,7 | 4,5 |
| RA 2          | 42          | 18 | 8,3 | 14,7 | 4,5 |
| RA 2          | 50          | 18 | 8,3 | 14,7 | 4,5 |
| RA 2          | 52          | 18 | 8,3 | 14,7 | 4,5 |

FS 424 / VI

FS 424 / VI 1



| Größe<br>Size | D<br>FS 424 | M  | L  |
|---------------|-------------|----|----|
| VI 1          | 18          | M6 | 15 |
| VI 1          | 19          | M6 | 15 |
| VI 1          | 24          | M6 | 15 |
| VI 1          | 25          | M6 | 15 |
| VI 1          | 30          | M6 | 15 |
| VI 1          | 32          | M6 | 15 |
| VI 2          | 40          | M8 | 18 |
| VI 2          | 42          | M8 | 18 |
| VI 2          | 50          | M8 | 18 |
| VI 2          | 52          | M8 | 18 |



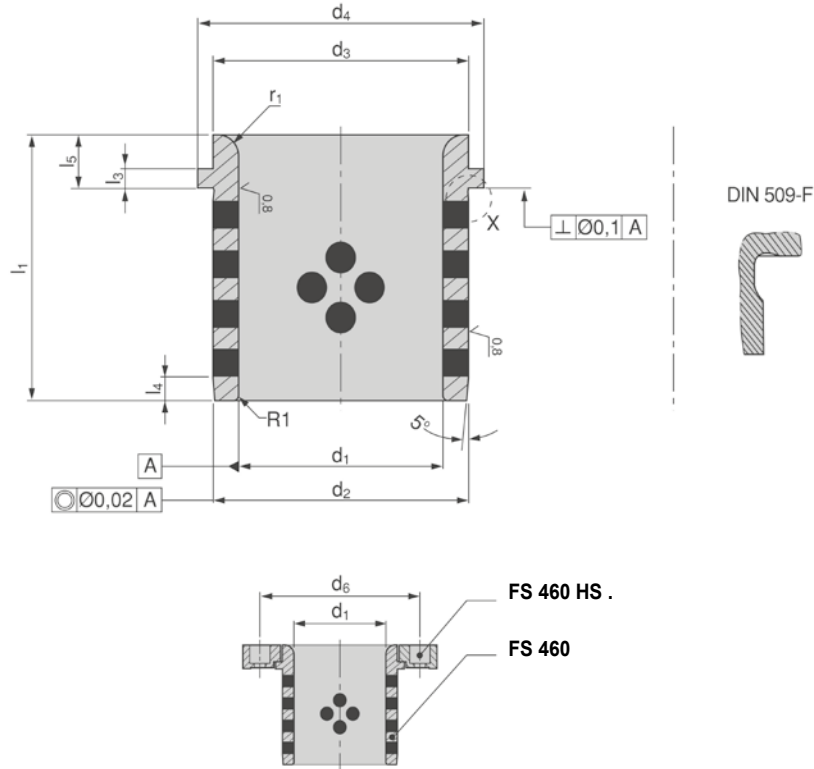
**FS 460**

mit Bund  
Mat.: Bronze-Graphit

with collar  
Mat.: Bronze-graphite

 **FS 460 / 40**

Haltestücke bitte gesondert bestellen! Holding clamps need to be ordered separately!



| d1         | d2  | d3    | d4   | d6   | l1      | l3   | l4   | l5   | r1 | Haltestück Typ<br>Holding clamps type |
|------------|-----|-------|------|------|---------|------|------|------|----|---------------------------------------|
| H7         | h6  | -0,25 | -0,8 | ±0,3 | -0,5/-1 | ±0,1 | ±1   | -0,5 |    |                                       |
| <b>25</b>  | 32  | 32    | 40   | 58   | 40      | 6,3  | 3    | 10   | 3  | FS 460 HS 1                           |
| <b>32</b>  | 40  | 40    | 50   | 66   | 50      | 6,3  | 4    | 12   | 3  | FS 460 HS 1                           |
| <b>40</b>  | 50  | 50    | 63   | 79   | 63      | 6,3  | 5    | 15   | 3  | FS 460 HS 1                           |
| <b>50</b>  | 63  | 63    | 71   | 89   | 71      | 6,3  | 6,3  | 17   | 5  | FS 460 HS 1                           |
| <b>63</b>  | 80  | 80    | 90   | 123  | 80      | 10   | 8    | 19   | 6  | FS 460 HS 2                           |
| <b>80</b>  | 100 | 100   | 112  | 143  | 100     | 10   | 10   | 22   | 8  | FS 460 HS 2                           |
| <b>100</b> | 125 | 125   | 140  | 168  | 125     | 10   | 12,5 | 21   | 10 | FS 460 HS 2                           |
| <b>125</b> | 160 | 160   | 180  | 203  | 160     | 10   | 16   | 30   | 12 | FS 460 HS 2                           |
| <b>160</b> | 200 | 200   | 220  | 243  | 200     | 10   | 16   | 32   | 18 | FS 460 HS 2                           |

[FS]



**FS 460 HS .**

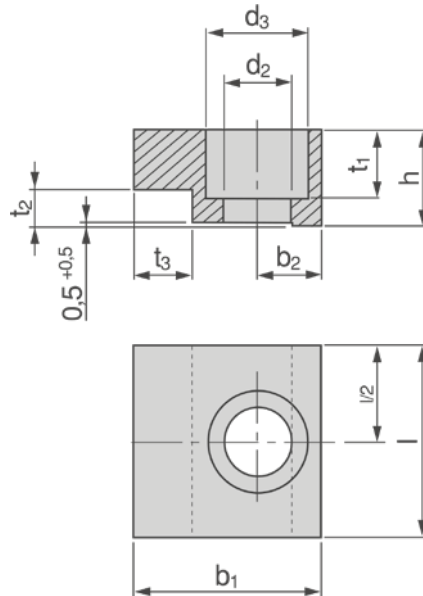
für Führungsbuchse FS 460  
nach DIN 9834 / ISO 9448

for leader pin bushings FS 460  
DIN 9834 / ISO 9448

**FS 460 HS 1**

Mat.: CK45

Mat.: CK45



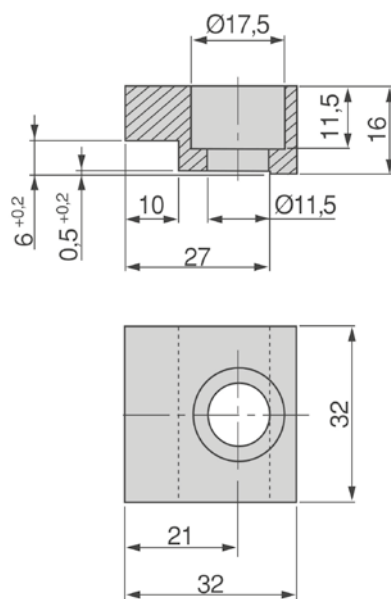
| Typ<br>Type | b1 | b2   | d2<br>+0,2 | d3<br>+0,2 | h  | l<br>-0,3 | t1   | t2  | t3 | Ø Buchse<br>Ø Bushing | Schraube<br>Screw |
|-------------|----|------|------------|------------|----|-----------|------|-----|----|-----------------------|-------------------|
| HS 1        | 20 | 7,5  | 7          | 11         | 10 | 20        | 7    | 6,3 | 5  | 25-50                 | M6x16             |
| HS 2        | 32 | 11,0 | 11,5       | 17,5       | 16 | 32        | 11,5 | 10  | 10 | 63-160                | M10x20            |

**FS 460 HS 3**

Mat.: CK45

Mat.: CK45

**FS 460 HS 3**



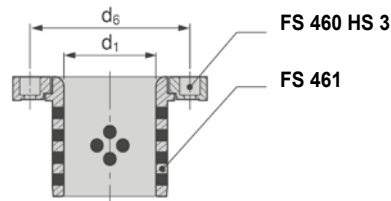
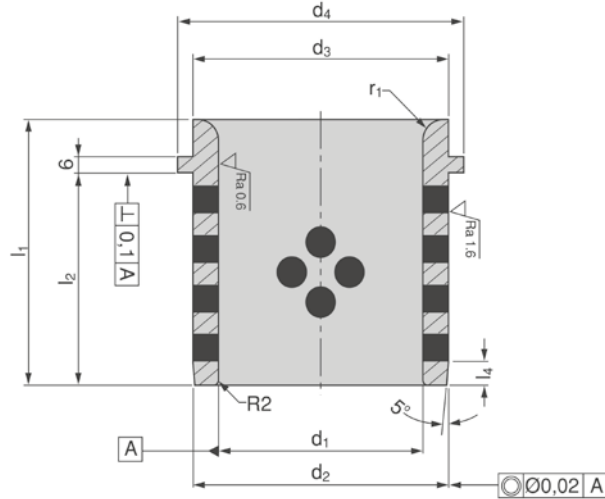
**FS 461**

mit Bund  
Mat.: Bronze-Graphit

with collar  
Mat.: Bronze-graphite

 **FS 461 / 40**

Haltestücke bitte gesondert bestellen! Holding clamps need to be ordered separately!



| d1         | d2  | d3    | d4   | d6   | l1   | l2  | l4 | r1 | Haltestück Typ<br>Holding clamps type |
|------------|-----|-------|------|------|------|-----|----|----|---------------------------------------|
| H7         | g6  | -0,25 | -0,8 | ±0,3 | -0,5 |     |    |    |                                       |
| <b>25</b>  | 32  | 32    | 40   | 75   | 40   | 30  | 4  | 3  | FS 460 HS 3                           |
| <b>32</b>  | 40  | 40    | 50   | 83   | 50   | 40  | 4  | 3  | FS 460 HS 3                           |
| <b>40</b>  | 50  | 50    | 63   | 93   | 63   | 50  | 5  | 3  | FS 460 HS 3                           |
| <b>50</b>  | 63  | 63    | 71   | 106  | 71   | 56  | 6  | 5  | FS 460 HS 3                           |
| <b>63</b>  | 80  | 80    | 90   | 123  | 80   | 63  | 8  | 6  | FS 460 HS 3                           |
| <b>80</b>  | 100 | 100   | 112  | 143  | 100  | 80  | 10 | 8  | FS 460 HS 3                           |
| <b>100</b> | 125 | 125   | 140  | 168  | 125  | 106 | 12 | 10 | FS 460 HS 3                           |
| <b>125</b> | 160 | 160   | 180  | 203  | 160  | 132 | 12 | 12 | FS 460 HS 3                           |

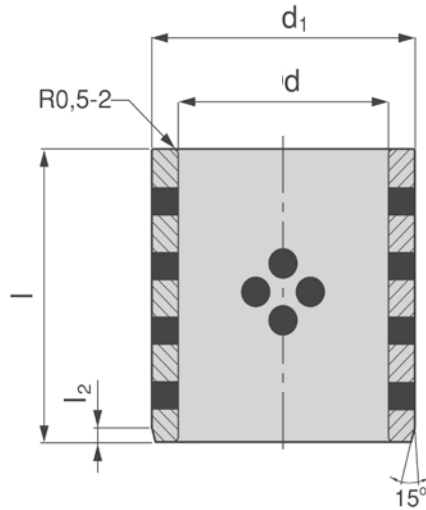
[FS]

FS 462

ohne Bund  
Mat.: Bronze-Graphit

without collar  
Mat.: Bronze-graphite

FS 462 / 20 x 28 x 30



| d   | d1  | l |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     | l2 |
|-----|-----|---|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|----|
|     |     | 8 | 10 | 12 | 15 | 16 | 20 | 25 | 30 | 35 | 40 | 50 | 60 | 70 | 80 | 100 | 120 |    |
| F7  | m6  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |    |
| 8   | 12  | • | •  | •  | •  |    |    |    |    |    |    |    |    |    |    |     |     | 2  |
| 10  | 14  |   | •  | •  | •  |    | •  |    |    |    |    |    |    |    |    |     |     | 2  |
| 12  | 18  |   | •  | •  |    | •  | •  | •  | •  |    |    |    |    |    |    |     |     | 2  |
| 16  | 22  |   |    | •  |    | •  | •  | •  | •  | •  |    |    |    |    |    |     |     | 2  |
| 18  | 24  |   |    |    |    |    | •  | •  | •  | •  | •  |    |    |    |    |     |     | 2  |
| 20  | 28  |   |    |    |    |    | •  | •  | •  | •  | •  |    |    |    |    |     |     | 2  |
| 20  | 30  |   |    |    |    | •  | •  | •  | •  | •  | •  |    |    |    |    |     |     | 2  |
| 25  | 33  |   |    |    |    |    | •  | •  | •  | •  | •  | •  |    |    |    |     |     | 2  |
| 25  | 35  |   |    |    |    |    | •  | •  | •  | •  | •  | •  |    |    |    |     |     | 2  |
| 30  | 38  |   |    |    |    |    |    | •  | •  | •  | •  | •  | •  |    |    |     |     | 2  |
| 30  | 40  |   |    |    |    |    | •  | •  | •  | •  | •  | •  | •  |    |    |     |     | 2  |
| 35  | 44  |   |    |    |    |    |    |    |    | •  | •  | •  | •  |    |    |     |     | 2  |
| 35  | 45  |   |    |    |    |    |    |    | •  |    | •  | •  | •  |    |    |     |     | 2  |
| 40  | 50  |   |    |    |    |    |    | •  | •  | •  | •  | •  | •  |    |    |     |     | 2  |
| 40  | 55  |   |    |    |    |    |    |    |    |    | •  | •  | •  |    |    |     |     | 2  |
| 50  | 60  |   |    |    |    |    |    |    |    |    | •  | •  | •  | •  |    |     |     | 2  |
| 50  | 62  |   |    |    |    |    |    |    |    |    |    | •  | •  | •  |    |     |     | 2  |
| 50  | 65  |   |    |    |    |    |    |    |    |    |    | •  |    | •  |    |     |     | 2  |
| 60  | 75  |   |    |    |    |    |    |    |    |    |    | •  | •  |    | •  |     |     | 2  |
| 70  | 85  |   |    |    |    |    |    |    |    |    |    |    | •  | •  | •  | •   |     | 2  |
| 80  | 96  |   |    |    |    |    |    |    |    |    |    |    |    | •  |    |     | •   | 2  |
| 80  | 100 |   |    |    |    |    |    |    |    |    |    |    |    | •  |    |     | •   | 2  |
| 100 | 120 |   |    |    |    |    |    |    |    |    |    |    |    |    |    |     | •   | 2  |
| 110 | 130 |   |    |    |    |    |    |    |    |    |    |    |    |    |    | •   | •   | 2  |
| 130 | 150 |   |    |    |    |    |    |    |    |    |    |    |    |    |    |     | •   | 4  |

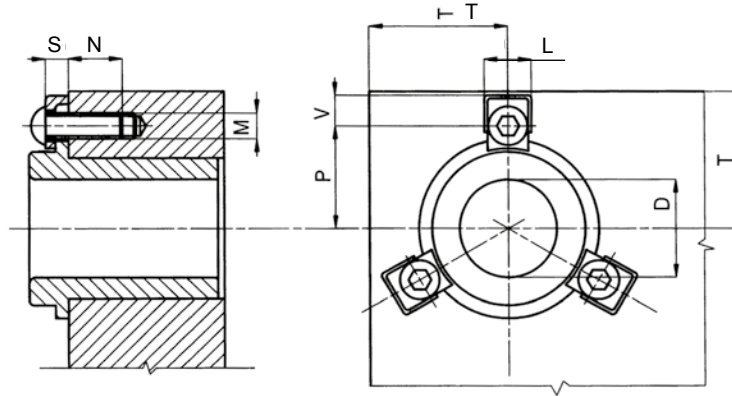


## FS 955

Haltestücke werden mit Schrauben  
geliefert

Holding clamps come with correspond-  
ing screws

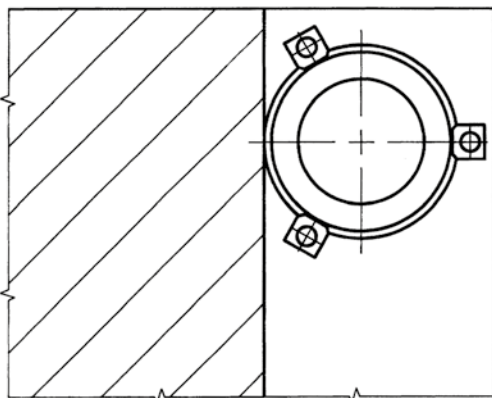
FS 955 / A



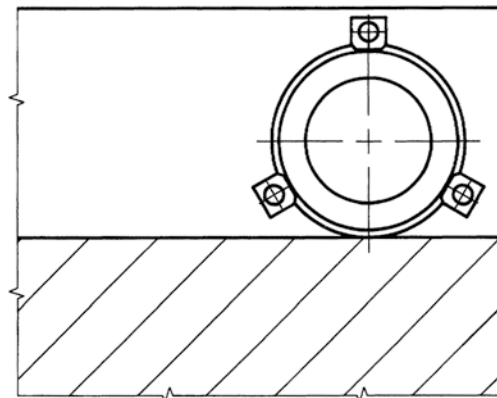
| Ausführung<br>Style | D     | L    | M  | N  | S   | V   |
|---------------------|-------|------|----|----|-----|-----|
| A                   | 18-19 | 12   | M6 | 12 | 6,7 | 6,0 |
| A                   | 24-25 | 12   | M6 | 12 | 6,7 | 6,0 |
| B                   | 30-32 | 14,5 | M8 | 16 | 7   | 7,2 |
| B                   | 40-42 | 14,5 | M8 | 16 | 7   | 7,2 |
| B                   | 50-52 | 14,5 | M8 | 16 | 7   | 7,2 |
| B                   | 63-80 | 14,5 | M8 | 16 | 7   | 7,2 |

| für Bundbuchsen mit Stahl- oder Bronzebeschichtung<br>for leader pin bushings with collar steel or bronze-plated |      |    | für Bundbuchsen mit Kugelführung<br>for leader pin bushings with collar ball cage |      |    |
|--|------|----|---|------|----|
| D  | P    | T  | D   | P    | T  |
| 18-19  | 20,5 | 32 | 18-19   | 23,5 | 35 |
| 24-25  | 25,5 | 37 | 24-25   | 28,5 | 40 |
| 30-32  | 31,5 | 44 | 30-32   | 35,5 | 48 |
| 40-42  | 36,5 | 49 | 40-42   | 40,5 | 53 |
| 50-52  | 44,5 | 57 | 50-52   | 48,5 | 61 |
| 63   | 51   | 64 |   |      |    |
| 80   | 60,5 | 73 |   |      |    |

## Anordnung der Haltestücke bei Stahlgestellen / Location of holding clamps in die sets



Position Z



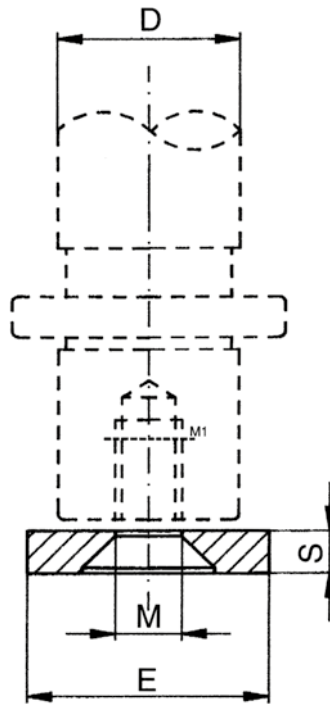
Position X

### FS 958

Mat.: C 40, brüniert  
Scheibe wird mit Schraube befestigt

Mat.: C 40, gunmetal-finished  
Mount disk with screw.

FS 958 / A



| Ausführung Style | D     | E  | S  | M   |
|------------------|-------|----|----|-----|
| A                | 18-19 | 25 | 6  | M8  |
| B                | 24-25 | 32 | 7  | M10 |
| C                | 30-32 | 40 | 7  | M10 |
| D                | 40-42 | 50 | 9  | M12 |
| E                | 50-52 | 62 | 9  | M12 |
| F                | 63    | 73 | 9  | M12 |
| G                | 80    | 93 | 12 | M12 |

[FS]





**FS 500**

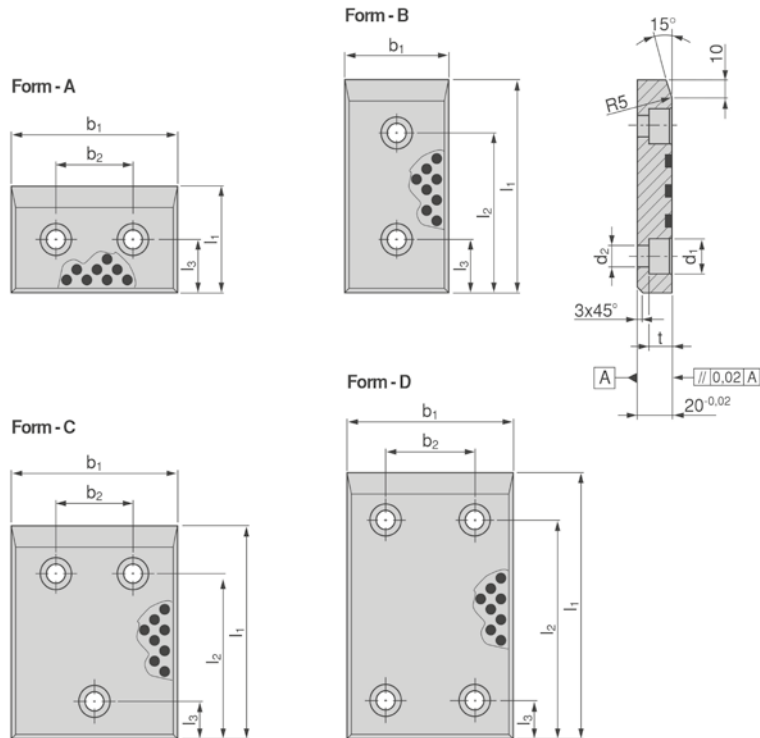
Mat.: Bronze

Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

Mat.: Bronze

Bronze wear plates with self lubricating graphite plugs ensure even during long-term production cycles a low maintenance operation.

**FS 500 / 50 x 100**



| b1  | l1  | Form | b2 | d1 | d2   | l2  | l3 | t  |
|-----|-----|------|----|----|------|-----|----|----|
| 50  | 80  | B    | -  | 15 | 9    | 55  | 25 | 9  |
| 50  | 100 | B    | -  | 20 | 13,5 | 75  | 25 | 13 |
| 50  | 125 | B    | -  | 20 | 13,5 | 100 | 25 | 13 |
| 50  | 160 | B    | -  | 20 | 13,5 | 135 | 25 | 13 |
| 50  | 200 | B    | -  | 20 | 13,5 | 175 | 25 | 13 |
| 80  | 50  | A    | 30 | 15 | 9    | -   | 25 | 9  |
| 80  | 80  | B    | -  | 20 | 13,5 | 55  | 25 | 13 |
| 80  | 100 | B    | -  | 20 | 13,5 | 75  | 25 | 13 |
| 80  | 125 | B    | -  | 20 | 13,5 | 100 | 25 | 13 |
| 80  | 160 | B    | -  | 20 | 13,5 | 135 | 25 | 13 |
| 80  | 200 | B    | -  | 20 | 13,5 | 175 | 25 | 13 |
| 80  | 250 | B    | -  | 20 | 13,5 | 210 | 40 | 13 |
| 80  | 315 | B    | -  | 20 | 13,5 | 275 | 40 | 13 |
| 100 | 50  | A    | 50 | 20 | 13,5 | -   | 25 | 13 |
| 100 | 80  | A    | 50 | 20 | 13,5 | -   | 40 | 13 |
| 100 | 100 | B    | -  | 20 | 13,5 | 75  | 25 | 13 |
| 100 | 125 | B    | -  | 20 | 13,5 | 100 | 25 | 13 |
| 100 | 160 | B    | -  | 20 | 13,5 | 135 | 25 | 13 |
| 100 | 200 | B    | -  | 20 | 13,5 | 175 | 25 | 13 |

| b1  | l1  | Form | b2  | d1 | d2   | l2  | l3 | t  |
|-----|-----|------|-----|----|------|-----|----|----|
| 100 | 250 | B    | -   | 20 | 13,5 | 210 | 40 | 13 |
| 100 | 315 | B    | -   | 20 | 13,5 | 275 | 40 | 13 |
| 125 | 50  | A    | 75  | 20 | 13,5 | -   | 25 | 13 |
| 125 | 80  | A    | 75  | 20 | 13,5 | -   | 40 | 13 |
| 125 | 100 | C    | 75  | 20 | 13,5 | 75  | 25 | 13 |
| 125 | 125 | C    | 75  | 20 | 13,5 | 100 | 25 | 13 |
| 125 | 160 | C    | 75  | 20 | 13,5 | 135 | 25 | 13 |
| 125 | 200 | C    | 75  | 20 | 13,5 | 175 | 25 | 13 |
| 125 | 250 | C    | 75  | 20 | 13,5 | 210 | 40 | 13 |
| 125 | 315 | C    | 75  | 20 | 13,5 | 275 | 40 | 13 |
| 160 | 50  | A    | 110 | 20 | 13,5 | -   | 25 | 13 |
| 160 | 80  | A    | 110 | 20 | 13,5 | -   | 40 | 13 |
| 160 | 100 | C    | 110 | 20 | 13,5 | 75  | 25 | 13 |
| 160 | 125 | C    | 110 | 20 | 13,5 | 100 | 25 | 13 |
| 160 | 160 | C    | 110 | 20 | 13,5 | 135 | 25 | 13 |
| 160 | 200 | C    | 110 | 20 | 13,5 | 175 | 25 | 13 |
| 160 | 250 | D    | 110 | 20 | 13,5 | 210 | 40 | 13 |
| 160 | 315 | D    | 110 | 20 | 13,5 | 275 | 40 | 13 |

[FS]

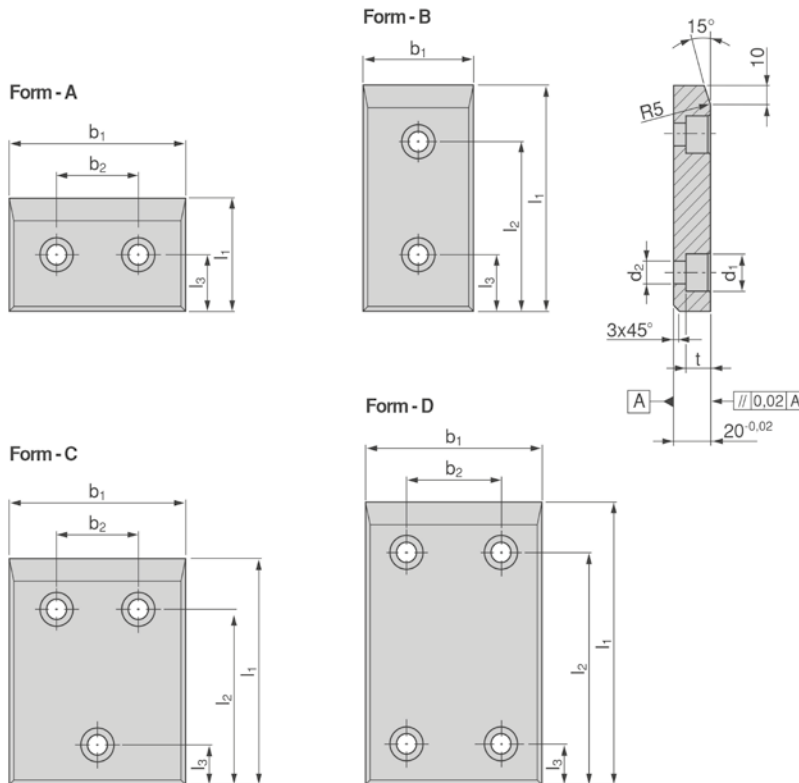


FS 501

Mat.: 16MnCr5  
Oberflächenhärte: 60 - 64 HRC

Mat.: 16MnCr5  
Surface hardness: 60 - 64 HRC

FS 501 / 80 x 50



| b1  | l1  | Form | b2 | d1 | d2   | l2  | l3 | t  |
|-----|-----|------|----|----|------|-----|----|----|
| 50  | 80  | B    | -  | 15 | 9    | 55  | 25 | 9  |
| 50  | 100 | B    | -  | 20 | 13,5 | 75  | 25 | 13 |
| 50  | 125 | B    | -  | 20 | 13,5 | 100 | 25 | 13 |
| 50  | 160 | B    | -  | 20 | 13,5 | 135 | 25 | 13 |
| 50  | 200 | B    | -  | 20 | 13,5 | 175 | 25 | 13 |
| 80  | 50  | A    | 30 | 15 | 9    | -   | 25 | 9  |
| 80  | 80  | B    | -  | 20 | 13,5 | 55  | 25 | 13 |
| 80  | 100 | B    | -  | 20 | 13,5 | 75  | 25 | 13 |
| 80  | 125 | B    | -  | 20 | 13,5 | 100 | 25 | 13 |
| 80  | 160 | B    | -  | 20 | 13,5 | 135 | 25 | 13 |
| 80  | 200 | B    | -  | 20 | 13,5 | 175 | 25 | 13 |
| 80  | 250 | B    | -  | 20 | 13,5 | 210 | 40 | 13 |
| 80  | 315 | B    | -  | 20 | 13,5 | 275 | 40 | 13 |
| 100 | 50  | A    | 50 | 20 | 13,5 | -   | 25 | 13 |
| 100 | 80  | A    | 50 | 20 | 13,5 | -   | 40 | 13 |
| 100 | 100 | B    | -  | 20 | 13,5 | 75  | 25 | 13 |
| 100 | 125 | B    | -  | 20 | 13,5 | 100 | 25 | 13 |
| 100 | 160 | B    | -  | 20 | 13,5 | 135 | 25 | 13 |
| 100 | 200 | B    | -  | 20 | 13,5 | 175 | 25 | 13 |

| b1  | l1  | Form | b2  | d1 | d2   | l2  | l3 | t  |
|-----|-----|------|-----|----|------|-----|----|----|
| 100 | 250 | B    | -   | 20 | 13,5 | 210 | 40 | 13 |
| 100 | 315 | B    | -   | 20 | 13,5 | 275 | 40 | 13 |
| 125 | 50  | A    | 75  | 20 | 13,5 | -   | 25 | 13 |
| 125 | 80  | A    | 75  | 20 | 13,5 | -   | 40 | 13 |
| 125 | 100 | C    | 75  | 20 | 13,5 | 75  | 25 | 13 |
| 125 | 125 | C    | 75  | 20 | 13,5 | 100 | 25 | 13 |
| 125 | 160 | C    | 75  | 20 | 13,5 | 135 | 25 | 13 |
| 125 | 200 | C    | 75  | 20 | 13,5 | 175 | 25 | 13 |
| 125 | 250 | C    | 75  | 20 | 13,5 | 210 | 40 | 13 |
| 125 | 315 | C    | 75  | 20 | 13,5 | 275 | 40 | 13 |
| 160 | 50  | A    | 110 | 20 | 13,5 | -   | 25 | 13 |
| 160 | 80  | A    | 110 | 20 | 13,5 | -   | 40 | 13 |
| 160 | 100 | C    | 110 | 20 | 13,5 | 75  | 25 | 13 |
| 160 | 125 | C    | 110 | 20 | 13,5 | 100 | 25 | 13 |
| 160 | 160 | C    | 110 | 20 | 13,5 | 135 | 25 | 13 |
| 160 | 200 | C    | 110 | 20 | 13,5 | 175 | 25 | 13 |
| 160 | 250 | D    | 110 | 20 | 13,5 | 210 | 40 | 13 |
| 160 | 315 | D    | 110 | 20 | 13,5 | 275 | 40 | 13 |



**FS 502**

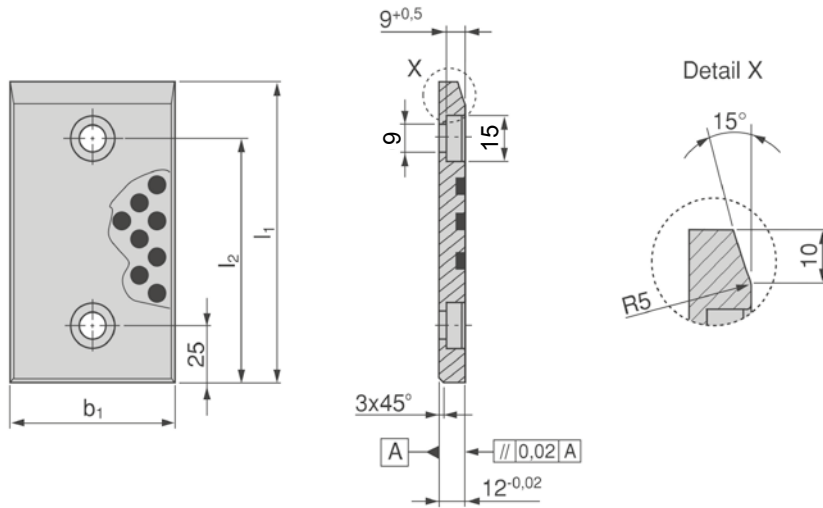
Mat.: Bronze

Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

Mat.: Bronze

Bronze wear plates with self lubricating graphite plugs ensure even during long-term production cycles a low maintenance operation.

 **FS 502 / 30 x 80**



| b1 | l1  | l2  |
|----|-----|-----|
| 30 | 80  | 55  |
| 30 | 100 | 75  |
| 30 | 125 | 100 |
| 30 | 160 | 135 |
| 30 | 200 | 175 |
| 40 | 80  | 55  |
| 40 | 100 | 75  |
| 40 | 125 | 100 |
| 40 | 160 | 135 |
| 40 | 200 | 175 |
| 50 | 80  | 55  |
| 50 | 100 | 75  |
| 50 | 125 | 100 |

| b1 | l1  | l2  |
|----|-----|-----|
| 50 | 160 | 135 |
| 50 | 200 | 175 |
| 60 | 80  | 55  |
| 60 | 100 | 75  |
| 60 | 125 | 100 |
| 60 | 160 | 135 |
| 60 | 200 | 175 |
| 80 | 80  | 55  |
| 80 | 100 | 75  |
| 80 | 125 | 100 |
| 80 | 160 | 135 |
| 80 | 200 | 175 |

[FS]



**FS 503**

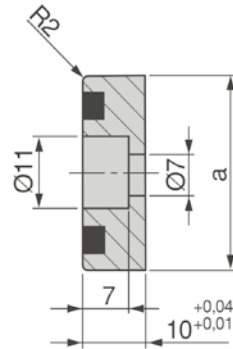
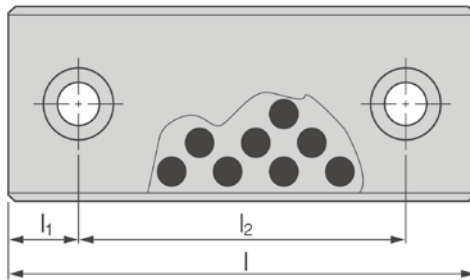
Mat.: Bronze-Graphit

Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

Mat.: Bronze-graphite

Bronze wear plates with self lubricating graphite plugs ensure a low maintenance operation, even during long-term production cycles.

 **FS 503 / 18 x 125**



| a  | l   | l1 | l2  |
|----|-----|----|-----|
| 18 | 75  | 15 | 45  |
| 18 | 100 | 25 | 50  |
| 18 | 125 | 25 | 75  |
| 18 | 150 | 25 | 100 |
| 28 | 75  | 15 | 45  |
| 28 | 100 | 25 | 50  |
| 28 | 125 | 25 | 75  |
| 28 | 150 | 25 | 100 |
| 38 | 75  | 15 | 45  |
| 38 | 100 | 25 | 50  |
| 38 | 125 | 25 | 75  |
| 38 | 150 | 25 | 100 |
| 48 | 75  | 15 | 45  |
| 48 | 100 | 25 | 50  |
| 48 | 125 | 25 | 75  |
| 48 | 150 | 25 | 100 |



**FS 504**

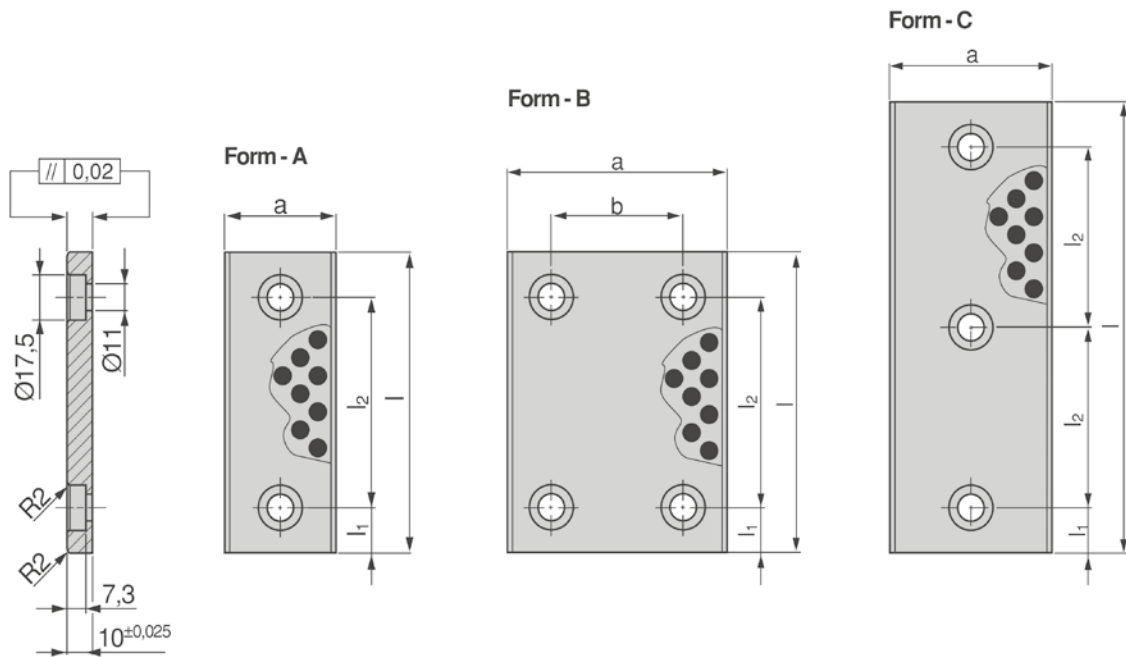
Mat.: Bronze-Graphit

Mat.: Bronze-graphite

 **FS 504 / 48 x 150**

Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

Bronze wear plates with self lubricating graphite plugs ensure a low maintenance operation, even during long-term production cycles.



| a  | l   | Form | b | l1 | l2  |
|----|-----|------|---|----|-----|
| 28 | 75  | A    | - | 15 | 45  |
| 28 | 100 | A    | - | 25 | 50  |
| 28 | 125 | A    | - | 25 | 75  |
| 28 | 150 | A    | - | 25 | 100 |
| 38 | 75  | A    | - | 15 | 45  |
| 38 | 100 | A    | - | 25 | 50  |
| 38 | 125 | A    | - | 25 | 75  |
| 38 | 150 | A    | - | 25 | 100 |
| 48 | 75  | A    | - | 15 | 45  |
| 48 | 100 | A    | - | 25 | 50  |
| 48 | 125 | A    | - | 25 | 75  |
| 48 | 150 | A    | - | 25 | 100 |
| 48 | 200 | A    | - | 50 | 100 |
| 58 | 75  | A    | - | 15 | 45  |
| 58 | 100 | A    | - | 25 | 50  |
| 58 | 125 | A    | - | 25 | 75  |
| 58 | 150 | A    | - | 25 | 100 |

| a   | l   | Form | b   | l1 | l2  |
|-----|-----|------|-----|----|-----|
| 58  | 200 | A    | -   | 50 | 100 |
| 75  | 75  | A    | -   | 15 | 45  |
| 75  | 100 | A    | -   | 25 | 50  |
| 75  | 125 | A    | -   | 25 | 75  |
| 75  | 150 | A    | -   | 25 | 100 |
| 75  | 200 | C    | -   | 25 | 75  |
| 100 | 100 | B    | 50  | 25 | 50  |
| 100 | 125 | B    | 50  | 25 | 75  |
| 100 | 150 | B    | 50  | 25 | 100 |
| 100 | 200 | B    | 50  | 25 | 150 |
| 100 | 250 | B    | 50  | 25 | 200 |
| 125 | 150 | B    | 50  | 25 | 100 |
| 125 | 200 | B    | 50  | 25 | 150 |
| 125 | 250 | B    | 50  | 25 | 200 |
| 150 | 150 | B    | 100 | 25 | 100 |
| 150 | 200 | B    | 100 | 25 | 150 |

[FS]

FS 505

Mat.: Bronze-Graphit

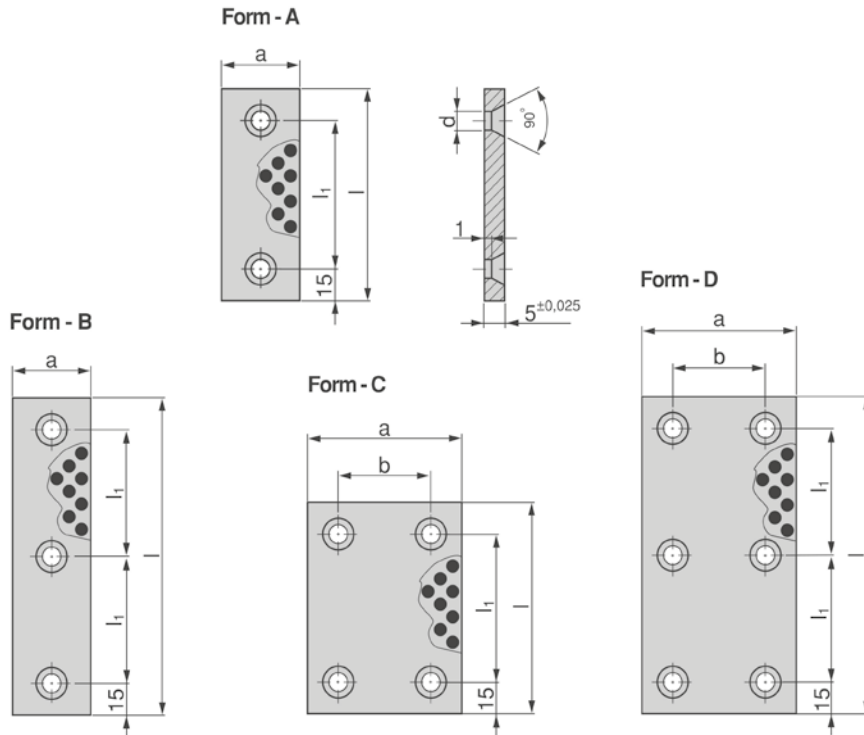
Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

Mat.: Bronze-graphite

Bronze wear plates with self lubricating graphite plugs ensure a low maintenance operation, even during long-term production cycles.

FS 505 / 75 x 75

[FS]



| a   | l   | Form | b  | d   | l1 |
|-----|-----|------|----|-----|----|
| 18  | 50  | A    | -  | 6,5 | 20 |
| 18  | 75  | A    | -  | 6,5 | 45 |
| 18  | 100 | A    | -  | 6,5 | 70 |
| 18  | 150 | B    | -  | 6,5 | 60 |
| 28  | 50  | A    | -  | 9   | 20 |
| 28  | 75  | A    | -  | 9   | 45 |
| 28  | 100 | A    | -  | 9   | 70 |
| 28  | 150 | B    | -  | 9   | 60 |
| 38  | 50  | A    | -  | 9   | 20 |
| 38  | 75  | A    | -  | 9   | 45 |
| 38  | 100 | A    | -  | 9   | 70 |
| 38  | 150 | B    | -  | 9   | 60 |
| 48  | 75  | A    | -  | 9   | 45 |
| 48  | 100 | A    | -  | 9   | 70 |
| 48  | 125 | A    | -  | 9   | 95 |
| 48  | 150 | B    | -  | 9   | 60 |
| 75  | 75  | C    | 45 | 9   | 45 |
| 75  | 100 | C    | 45 | 9   | 70 |
| 75  | 125 | C    | 45 | 9   | 95 |
| 75  | 150 | D    | 45 | 9   | 60 |
| 100 | 100 | C    | 70 | 9   | 70 |
| 100 | 125 | C    | 70 | 9   | 95 |
| 100 | 150 | D    | 70 | 9   | 60 |



**FS 506**

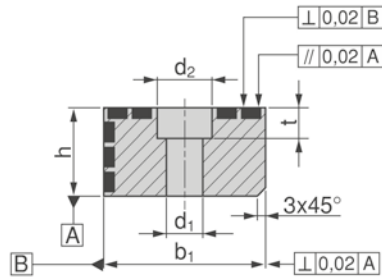
mit 2 Gleitflächen  
Mat.: Bronze-Graphit

Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

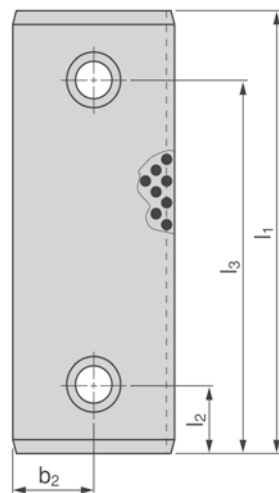
with 2 slide surfaces  
Mat.: Bronze-graphite

Bronze wear plates with self lubricating graphite plugs ensure a low maintenance operation, even during long-term production cycles.

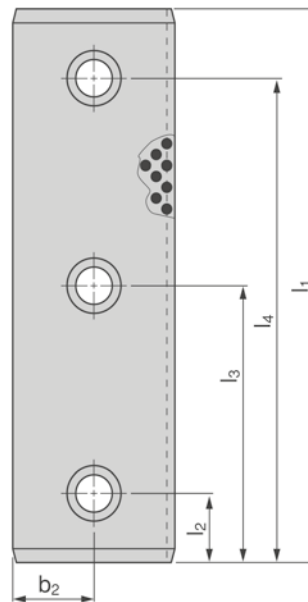
 **FS 506 / 15 x 110**



Form - A



Form - B



| h     | l1  | Form | b1    | b2   | d1   | d2  | l2 | l3   | l4   | t    |
|-------|-----|------|-------|------|------|-----|----|------|------|------|
| -0,02 | H7  |      | -0,02 |      | H13  | H13 |    | ±0,2 | ±0,2 | +0,5 |
| 12    | 110 | A    | 25    | 12,5 | 9    | 15  | 25 | 85   | -    | 8,5  |
| 12    | 120 | A    | 25    | 12,5 | 9    | 15  | 25 | 95   | -    | 8,5  |
| 15    | 110 | A    | 25    | 12,5 | 11   | 18  | 25 | 85   | -    | 10,5 |
| 15    | 120 | A    | 25    | 12,5 | 11   | 18  | 25 | 95   | -    | 10,5 |
| 30    | 125 | A    | 60    | 30   | 13,5 | 20  | 25 | 100  | -    | 13   |
| 30    | 160 | A    | 60    | 30   | 13,5 | 20  | 25 | 135  | -    | 13   |
| 30    | 200 | B    | 60    | 30   | 13,5 | 20  | 25 | 100  | 175  | 13   |
| 40    | 125 | A    | 60    | 30   | 13,5 | 20  | 25 | 100  | -    | 13   |
| 40    | 160 | A    | 60    | 30   | 13,5 | 20  | 25 | 135  | -    | 13   |
| 40    | 200 | B    | 60    | 30   | 13,5 | 20  | 25 | 100  | 175  | 13   |

[FS]



**FS 507**

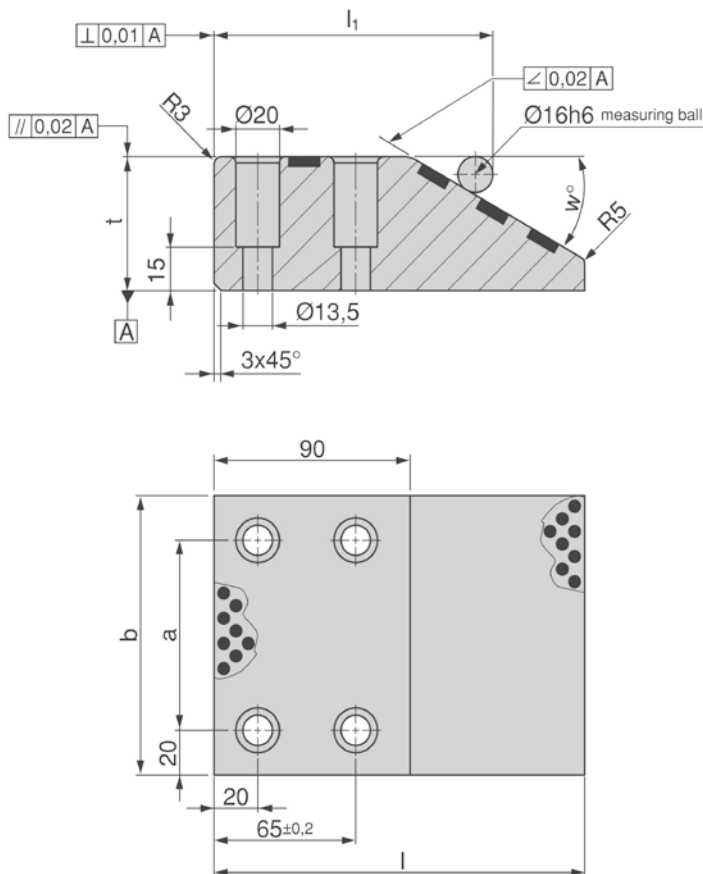
mit 2 Gleitflächen  
Mat.: Bronze-Graphit

with 2 slide surfaces  
Mat.: Bronze-graphite

**FS 507 /**  
**125 x 170 x 45**

Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

Bronze wear plates with self lubricating graphite plugs ensure a low maintenance operation, even during long-term production cycles.



| b   | l   | t<br>±0,1 | a   | l1<br>±0,5 | w   |
|-----|-----|-----------|-----|------------|-----|
| 100 | 170 | 45        | 60  | 143,37     | 20° |
| 125 | 170 | 45        | 85  | 143,37     | 20° |
| 150 | 170 | 45        | 110 | 143,37     | 20° |
| 100 | 150 | 45        | 60  | 127,86     | 30° |
| 100 | 170 | 60        | 60  | 127,86     | 30° |
| 125 | 150 | 45        | 85  | 127,86     | 30° |
| 125 | 170 | 60        | 85  | 127,86     | 30° |
| 150 | 150 | 45        | 110 | 127,86     | 30° |
| 150 | 170 | 60        | 110 | 127,86     | 30° |



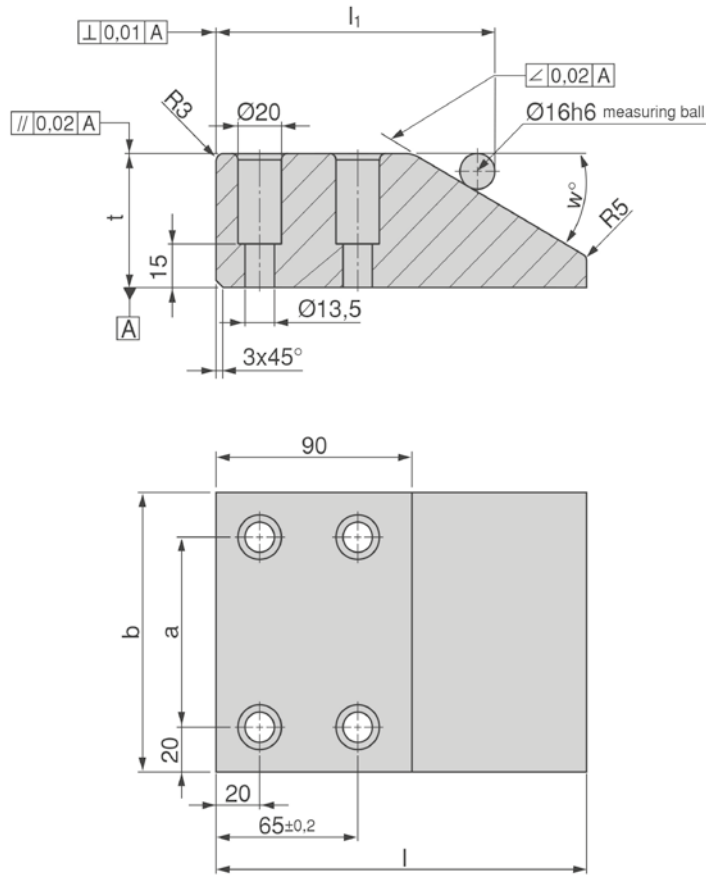


**FS 508**

Mat.: X153CrMoV12  
Oberflächenhärte: 60 - 62 HRC

Mat.: X153CrMoV12  
Surface hardness: 60 - 62 HRC

**FS 508 /**  
**125 x 170 x 45**



| b   | l   | t<br>±0,1 | a   | l1<br>±0,5 | w   |
|-----|-----|-----------|-----|------------|-----|
| 100 | 170 | 45        | 60  | 143,37     | 20° |
| 125 | 170 | 45        | 85  | 143,37     | 20° |
| 150 | 170 | 45        | 110 | 143,37     | 20° |
| 100 | 150 | 45        | 60  | 127,86     | 30° |
| 100 | 170 | 60        | 60  | 127,86     | 30° |
| 125 | 150 | 45        | 85  | 127,86     | 30° |
| 125 | 170 | 60        | 85  | 127,86     | 30° |
| 150 | 150 | 45        | 110 | 127,86     | 30° |
| 150 | 170 | 60        | 110 | 127,86     | 30° |

[FS]



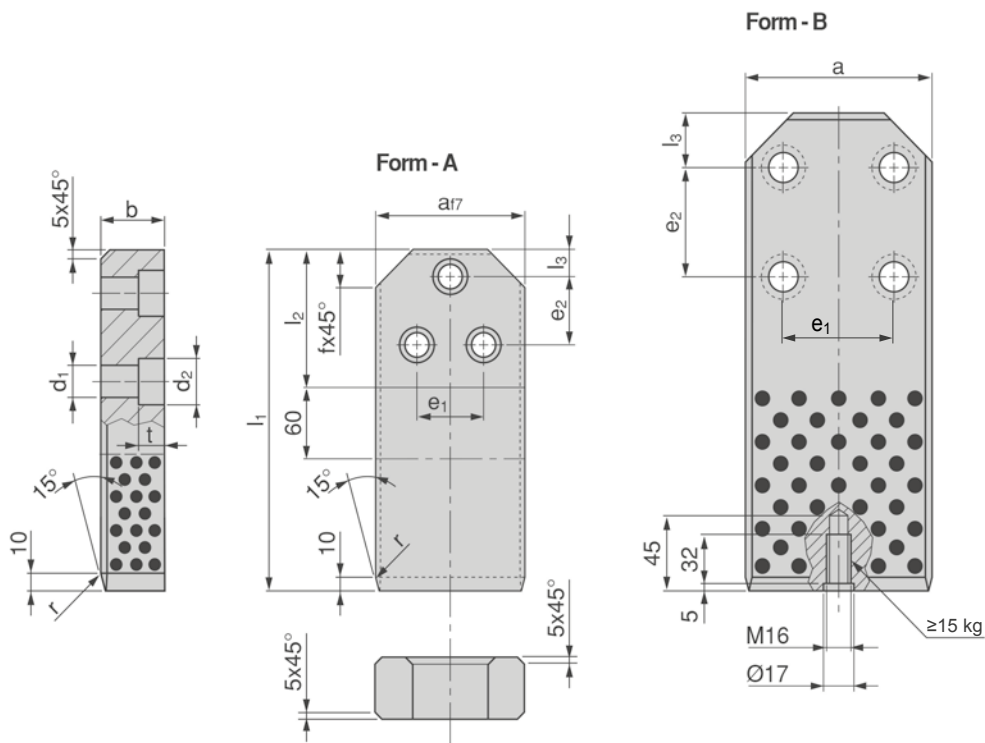
FS 509

Mat.: CK45  
Oberflächenhärte: 58 - 60 HRC

Mat.: CK45  
Surface hardness: 58 - 60 HRC

FS 509 /  
63 x 180 x 36

[FS]



| a   | l1  | b  | l2  | l3 | e1  | e2  | d1 | d2 | t    | f  | r    | Form |
|-----|-----|----|-----|----|-----|-----|----|----|------|----|------|------|
| 63  | 180 | 36 | 90  | 20 | 50  | 50  | 14 | 20 | 16   | 18 | 16   | A    |
| 63  | 200 | 36 | 90  | 20 | 50  | 50  | 14 | 20 | 16   | 18 | 16   | A    |
| 63  | 224 | 36 | 90  | 20 | 50  | 50  | 14 | 20 | 16   | 18 | 16   | A    |
| 71  | 180 | 36 | 90  | 20 | 50  | 50  | 14 | 20 | 16   | 18 | 16   | A    |
| 71  | 200 | 36 | 90  | 20 | 50  | 50  | 14 | 20 | 16   | 18 | 16   | A    |
| 71  | 224 | 36 | 90  | 20 | 50  | 50  | 14 | 20 | 16   | 18 | 16   | A    |
| 90  | 200 | 36 | 100 | 20 | 50  | 50  | 18 | 26 | 21   | 28 | 25   | A    |
| 90  | 224 | 36 | 100 | 20 | 50  | 50  | 18 | 26 | 21   | 28 | 25   | A    |
| 90  | 250 | 36 | 100 | 20 | 50  | 50  | 18 | 26 | 21   | 28 | 25   | A    |
| 90  | 200 | 45 | 100 | 20 | 50  | 50  | 18 | 26 | 21   | 28 | 25   | A    |
| 90  | 224 | 45 | 100 | 20 | 50  | 50  | 18 | 26 | 21   | 28 | 25   | A    |
| 90  | 250 | 45 | 100 | 20 | 50  | 50  | 18 | 26 | 21   | 28 | 25   | A    |
| 112 | 200 | 45 | 100 | 20 | 50  | 50  | 18 | 26 | 21   | 28 | 25   | A    |
| 112 | 224 | 45 | 100 | 20 | 50  | 50  | 18 | 26 | 21   | 28 | 25   | A    |
| 112 | 250 | 45 | 100 | 20 | 50  | 50  | 18 | 26 | 21   | 28 | 25   | A    |
| 140 | 315 | 45 | 150 | 40 | 90  | 80  | 22 | 33 | 25,5 | 36 | 31,5 | B    |
| 140 | 400 | 45 | 150 | 40 | 90  | 80  | 22 | 33 | 25,5 | 36 | 31,5 | B    |
| 140 | 315 | 56 | 150 | 40 | 90  | 80  | 22 | 33 | 25,5 | 36 | 31,5 | B    |
| 140 | 400 | 56 | 150 | 40 | 90  | 80  | 22 | 33 | 25,5 | 36 | 31,5 | B    |
| 190 | 315 | 45 | 150 | 40 | 90  | 80  | 22 | 33 | 25,5 | 36 | 31,5 | B    |
| 190 | 400 | 45 | 150 | 40 | 90  | 80  | 22 | 33 | 25,5 | 36 | 31,5 | B    |
| 190 | 315 | 56 | 150 | 40 | 90  | 80  | 22 | 33 | 25,5 | 36 | 31,5 | B    |
| 190 | 400 | 56 | 150 | 40 | 90  | 80  | 22 | 33 | 25,5 | 36 | 31,5 | B    |
| 240 | 500 | 56 | 250 | 40 | 160 | 160 | 26 | 40 | 30,5 | 36 | 31,5 | B    |
| 240 | 630 | 56 | 250 | 40 | 160 | 160 | 26 | 40 | 30,5 | 36 | 31,5 | B    |



FS 510

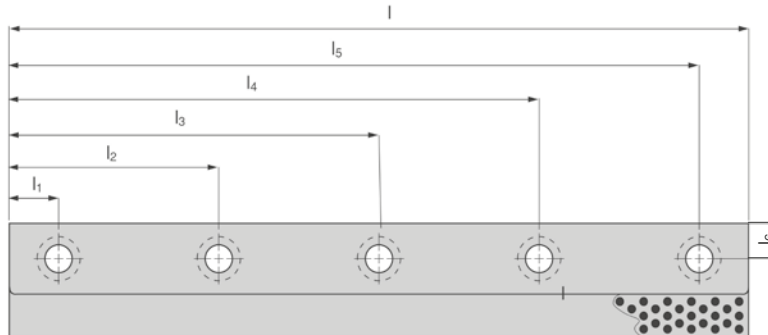
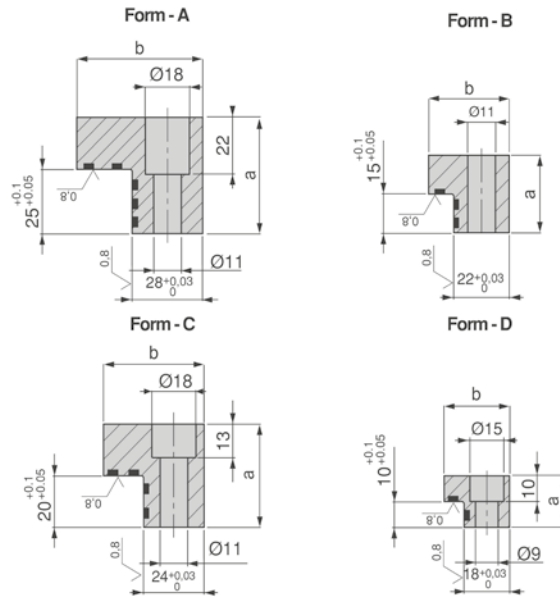
Mat.: Bronze-Graphit

Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

Mat.: Bronze-graphite

Bronze wear plates with self lubricating graphite plugs ensure a low maintenance operation, even during long-term production cycles.

 **FS 510 / 20 x 26 x 100**



| a<br>±0,25 | b<br>±0,25 | l   | Form | l1 | l2  | l3  | l4  | l5  | l6 | Bohrungen<br>Holes |
|------------|------------|-----|------|----|-----|-----|-----|-----|----|--------------------|
| 20         | 26         | 100 | D    | 20 | 80  | -   | -   | -   | 9  | 2                  |
| 20         | 26         | 150 | D    | 20 | 75  | 130 | -   | -   | 9  | 3                  |
| 20         | 26         | 200 | D    | 20 | 75  | 125 | 180 | -   | 9  | 4                  |
| 30         | 32         | 100 | B    | 20 | 80  | -   | -   | -   | 11 | 2                  |
| 30         | 32         | 150 | B    | 20 | 75  | 130 | -   | -   | 11 | 3                  |
| 30         | 32         | 200 | B    | 20 | 75  | 125 | 180 | -   | 11 | 4                  |
| 30         | 32         | 250 | B    | 20 | 90  | 160 | 230 | -   | 11 | 4                  |
| 40         | 40         | 160 | C    | 15 | 145 | -   | -   | -   | 12 | 2                  |
| 40         | 40         | 250 | C    | 15 | 145 | 225 | -   | -   | 12 | 3                  |
| 45         | 50         | 200 | A    | 20 | 75  | 125 | 180 | -   | 14 | 4                  |
| 45         | 50         | 250 | A    | 20 | 90  | 160 | 230 | -   | 14 | 4                  |
| 45         | 50         | 300 | A    | 20 | 85  | 150 | 215 | 280 | 14 | 5                  |
| 45         | 50         | 350 | A    | 20 | 100 | 175 | 250 | 330 | 14 | 5                  |

[FS]



FS 511

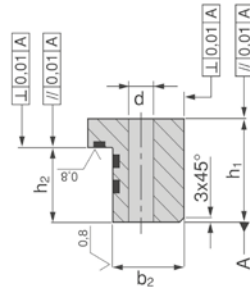
Mat.: Bronze-Graphit

Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

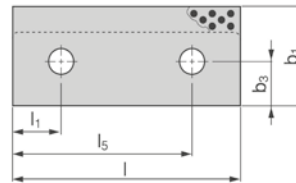
Mat.: Bronze-graphite

Bronze wear plates with self lubricating graphite plugs ensure a low maintenance operation, even during long-term production cycles.

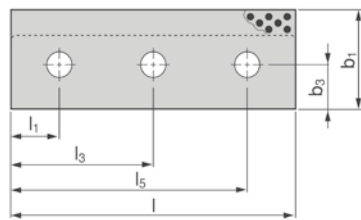
FS 511 /  
55 x 55 x 100



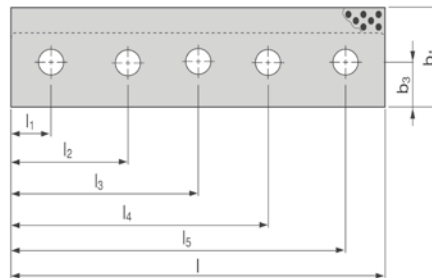
Form - A



Form - B



Form - C



| b1<br>±0,2 | h1<br>±0,2 | l<br>-0,2 | Form | b2<br>-0,02 | b3<br>±0,2 | d<br>H13 | l1<br>±0,2 | l2<br>±0,2 | l3<br>±0,2 | l4<br>±0,2 | l5<br>±0,2 | h2<br>+0,02 |
|------------|------------|-----------|------|-------------|------------|----------|------------|------------|------------|------------|------------|-------------|
| 55         | 55         | 100       | A    | 37          | 20         | 13,5     | 27,5       | -          | -          | -          | 72,5       | 39          |
| 55         | 55         | 160       | A    | 37          | 20         | 13,5     | 27,5       | -          | -          | -          | 132,5      | 39          |
| 70         | 75         | 160       | A    | 50          | 30         | 17,5     | 35         | -          | -          | -          | 125        | 55          |
| 70         | 75         | 200       | A    | 50          | 30         | 17,5     | 35         | -          | -          | -          | 165        | 55          |
| 70         | 75         | 250       | B    | 50          | 30         | 17,5     | 35         | -          | 125        | -          | 215        | 55          |
| 70         | 75         | 400       | C    | 50          | 30         | 17,5     | 35         | 125        | 200        | 275        | 365        | 55          |
| 85         | 90         | 160       | A    | 63          | 38         | 22       | 42,5       | -          | -          | -          | 117,5      | 65          |
| 85         | 90         | 200       | A    | 63          | 38         | 22       | 42,5       | -          | -          | -          | 157,5      | 65          |
| 85         | 90         | 250       | B    | 63          | 38         | 22       | 42,5       | -          | 125        | -          | 207,5      | 65          |
| 85         | 90         | 400       | C    | 63          | 38         | 22       | 42,5       | 125        | 200        | 275        | 357,5      | 65          |

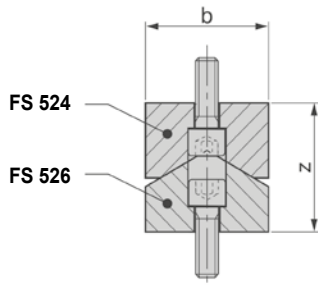
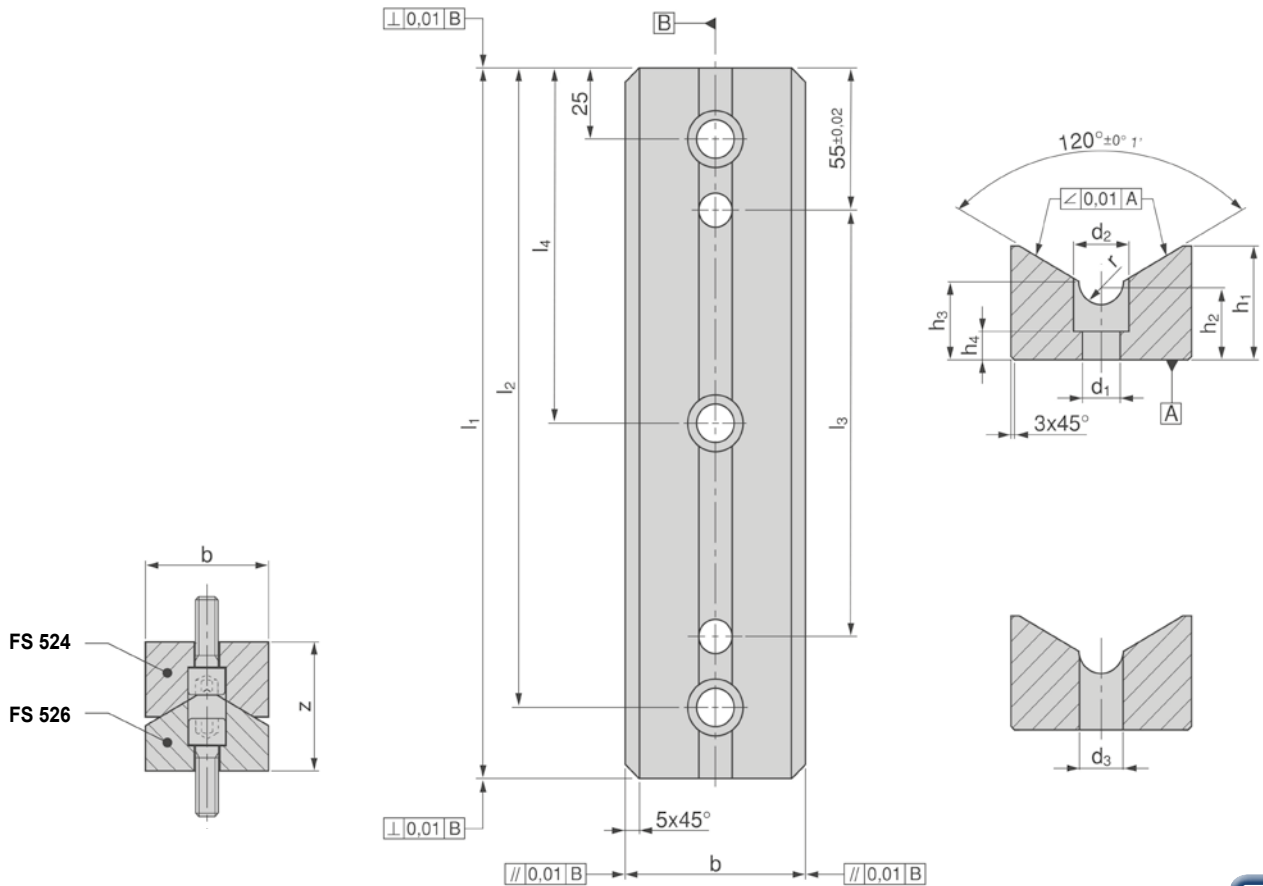


FS 524

Mat.: CK45  
Oberflächenhärte: 56 - 60 HRC

Mat.: CK45  
Surface hardness: 56 - 60 HRC

 FS 524 / 65 x 150



| b   | l1   | d1   | d2  | d3 | h1   | h2    | h3   | h4 | l2   | l3    | l4   | r  | z     |
|-----|------|------|-----|----|------|-------|------|----|------|-------|------|----|-------|
| h6  | -0,2 | H13  | H13 | H7 | ±0,2 | ±0,01 | ±0,2 |    | ±0,2 | ±0,01 | ±0,2 |    | +0,05 |
| 65  | 150  | 13,5 | 20  | 12 | 35   | 18    | 22   | 8  | 125  | 45    | -    | 7  | 65    |
| 65  | 200  | 13,5 | 20  | 12 | 35   | 18    | 22   | 8  | 175  | 95    | -    | 7  | 65    |
| 65  | 250  | 13,5 | 20  | 12 | 35   | 18    | 22   | 8  | 225  | 145   | 125  | 7  | 65    |
| 65  | 300  | 13,5 | 20  | 12 | 35   | 18    | 22   | 8  | 275  | 195   | 150  | 7  | 65    |
| 125 | 150  | 17,5 | 26  | 16 | 60   | 28    | 34   | 15 | 125  | 45    | -    | 10 | 85    |
| 125 | 200  | 17,5 | 26  | 16 | 60   | 28    | 34   | 15 | 175  | 95    | -    | 10 | 85    |
| 125 | 250  | 17,5 | 26  | 16 | 60   | 28    | 34   | 15 | 225  | 145   | 125  | 10 | 85    |
| 125 | 300  | 17,5 | 26  | 16 | 60   | 28    | 34   | 15 | 275  | 195   | 150  | 10 | 85    |

[FS]

FS 526

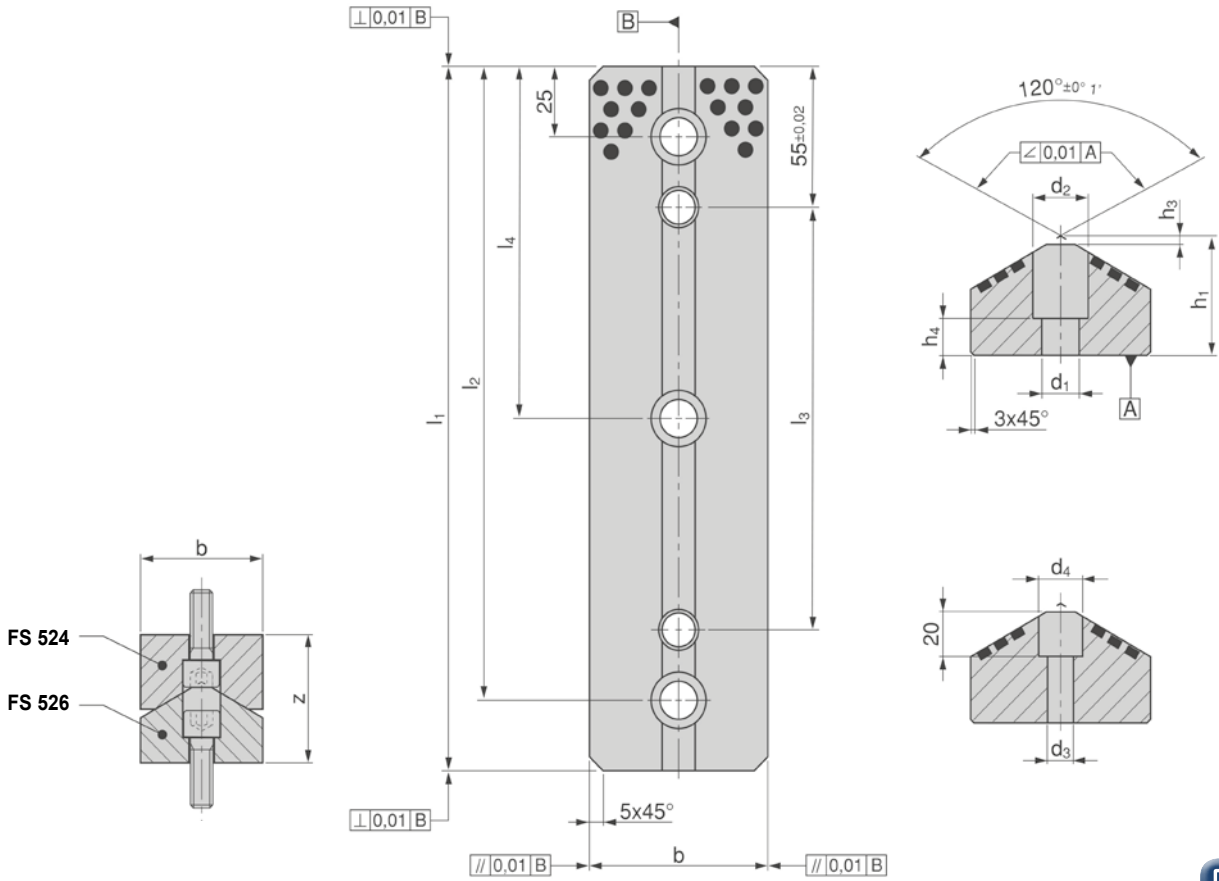
Mat.: Bronze-Graphit

Mat.: Bronze-graphite

FS 526 / 65 x 150

Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

Bronze wear plates with self lubricating graphite plugs ensure a low maintenance operation, even during long-term production cycles.



| b   | l1   | d1   | d2  | d3 | d4  | h1    | h3 | l2   | l3    | l4   | z     |
|-----|------|------|-----|----|-----|-------|----|------|-------|------|-------|
| h6  | -0,2 | H13  | H13 | H7 | H13 | ±0,01 |    | ±0,2 | ±0,01 | ±0,2 | +0,05 |
| 65  | 150  | 13,5 | 20  | 12 | 14  | 47    | 3  | 125  | 45    | -    | 65    |
| 65  | 200  | 13,5 | 20  | 12 | 14  | 47    | 3  | 175  | 95    | -    | 65    |
| 65  | 250  | 13,5 | 20  | 12 | 14  | 47    | 3  | 225  | 145   | 125  | 65    |
| 65  | 300  | 13,5 | 20  | 12 | 14  | 47    | 3  | 275  | 195   | 150  | 65    |
| 125 | 150  | 17,5 | 26  | 16 | 18  | 57    | 5  | 125  | 45    | -    | 85    |
| 125 | 200  | 17,5 | 26  | 16 | 18  | 57    | 5  | 175  | 95    | -    | 85    |
| 125 | 250  | 17,5 | 26  | 16 | 18  | 57    | 5  | 225  | 145   | 125  | 85    |
| 125 | 300  | 17,5 | 26  | 16 | 18  | 57    | 5  | 275  | 195   | 150  | 85    |

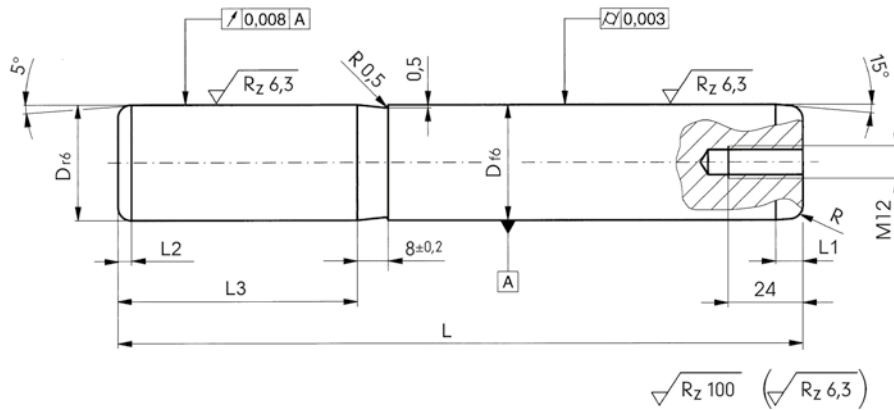
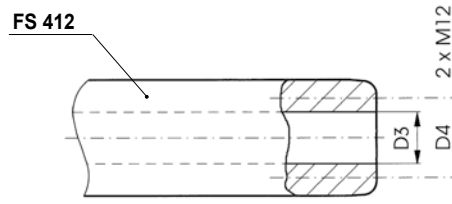




**FS 410**  
**FS 412**

Technischer Hinweis:  
Säulen-Aufnahmebohrungen: H7  
Säulentyp **FS 410** kann ab  $\varnothing 80$  mm mit 2 Transportgewinden M12 geliefert werden (bitte angeben).  
Säulentyp **FS 412** bis  $\varnothing 63$  mm ohne Hohlbohrung, ab  $\varnothing 80$  mm mit Hohlbohrung und 2 Transportgewinden M12 (bitte angeben).  
Passende Führungsbuchsen finden Sie auf Seite FS.22

Technical recommendation:  
Leader pin mounting holes: H7  
Leader pin type **FS 410** with 80 mm diameter and larger can be supplied with two transport-threads M12 (please specify when ordering).  
Leader pin type **FS 412** up to 63 mm without internal hole, 80 mm diameter and larger with internal hole and with two transport-threads M12 (please specify when ordering).





**FS 330 ... RM**  
**FS 340 ... RM**  
**FS 350 ... RM**  
**FS 430 ... RM**  
**FS 439 ... RM**  
**FS 440 ... RM**  
**FS 450 ... RM**

Bei RM-Coat handelt es sich um eine dunkelblaugraue Gleitstoffbeschichtung auf Basis Wolframdisulfid (WS2) mit einer Stärke von 0,0005 - 0,0015 mm, die bei Raumtemperatur aufgebracht wird und bis 650° C stabil bleibt.

Sie reduziert - abhängig vom spezifischen Anwendungsfall - die Reibung um bis zu 70%, was zu einer signifikanten Verbesserung der Schmier- und Gleiteigenschaften der beschichteten Teile führt. Außer einer leichten anfänglichen Schmierung und bei den üblichen Wartungen kann der Schmiermittel-Einsatz in vielen Fällen reduziert werden, wobei meist zusätzlich noch eine deutliche Verlängerung der Standzeiten zu verzeichnen ist.

Sie kann nicht nur, aber auch, auf andere Beschichtungen - wie z.B. PVD und CVD - zusätzlich aufgetragen werden.

Typische Anwendungsbeispiele finden sich beim Umformen, in Wälz- und Gleitlagern und in der Vakuumtechnik. Erstklassige Resultate werden auch im gesamten Bereich der Spritzgießtechnik erzielt, angefangen bei den Führungselementen bis hin zur Beschichtung von komplexen, schwer entformbaren Konturkernen.

Um eine bestmögliche Verbindung zum Trägermaterial zu gewährleisten, müssen die zu beschichtenden Teile vollständig (von Ölen / Fetten, Staub u.ä.) gesäubert werden.

Die Beschichtung lässt sich nur durch mechanische Bearbeitung wieder entfernen.

Die Technik der Wolframdisulfid-Beschichtung findet sich in jedem amerikanischen Flugzeug. Sie ist unter den strengen Auflagen der amerikanischen NAMSА - Class 6 getestet und als bio-kompatibel eingestuft worden. Der Beschichtungs-Prozess wird in Übereinstimmung mit den US-Militär - Spezifikationen DOD-L-85645 A Type 1 ausgeführt.

Im Programm der Märkischen Stanz-Partner werden die Artikel der Serie **FS 330 / ... bis FS 350 / ...** standardmäßig mit RM-Coat beschichtet, bei allen anderen Führungs- und Funktionsteilen nach Rücksprache bzw. nach Anforderung.

Bezüglich weiterer Anwendungsfälle sprechen Sie uns gerne an.

RM-Coat is a dark blue / grey tungsten disulfid (WS2) lubricant coating, being applied at room temperature with a thickness of 0,0005 - 0,0015 mm. It is stable up to 650 degrees Celsius.

Depending on the specific application, this coating reduces friction up to 70%, leading to significantly improved sliding-characteristics of the coated parts. After a slight initial lubrication (and during the usually scheduled maintenance works), in a lot of cases the lubricant can be reduced and minimized ... while at the same time in most cases the tool-life considerably extends.

The RM Coat can (not must !) be applied on other coatings like PVD and CVD as well.

Typical applications can be found in sheet metal forming processes, roller- and plain bearings and in vacuum technologies. Top results have been accomplished in injection molding as well, by coating not only guiding elements, but complex, hard-to-stripp-off cores.

To provide for an excellent connection between the coating and the carrying material, the part to be coated has to be cleaned completely from dust, oil, grease etc.

The coating can only be removed mechanically.

The WS2-coating-technique can be found on every American airplane. Metercoat has been NAMSА-Class 6 tested and certified as bio-compatible. The whole coating process is carried out in compliance with DOD-L-85645 A Type 1.

In our program the products from **FS 330 / ... to FS 350 / ...** and **FS 430 / ... to FS 450 / ...** are RM-coated as standards, all other (guiding- and other) products can be treated upon request.

Please contact us with your specific application.

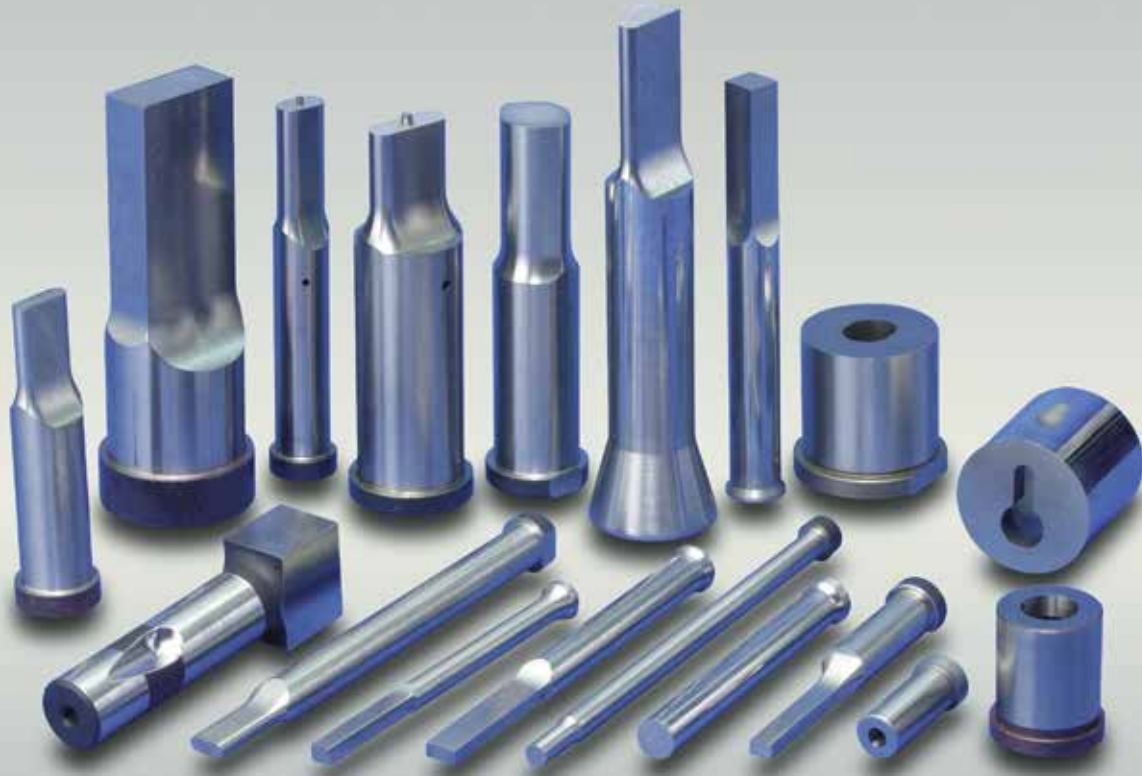






**MSP** **GN** **GM** **BH**


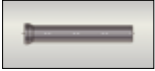











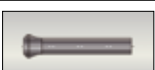



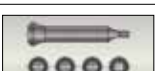
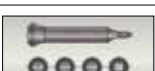


**Märkische Stanz-Partner**








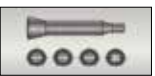

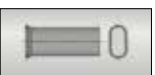
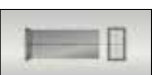



**[schneidelemente]**









**[cuttingelements]**











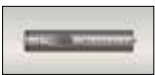











|    | <b>Schneidstempel</b>   | <b>Punches</b>  | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|---|---|--------------------------------|-----------------------|
|    | <u>Schneidstempel DIN 9861, Form D, HSS</u>   | <u>Punches DIN 9861, Form D, HSS</u>  | <b>SE 775</b>                  | <b>SE.1<br/>SE.2</b>  |
|    | <u>Schneidstempel DIN 9861, Form C, abgesetzter Schaft, HSS</u>   | <u>Punches DIN 9861, Form C, shouldered shank, HSS</u>                                      | <b>SE 785</b>                  | <b>SE.3</b>           |
|    | <u>Schneidstempel DIN 9861, Form C, abgesetzter Schaft, Typen F, O, R, S</u>                                  | <u>Punches DIN 9861, Form C, shouldered shank, Types F, O, R, S</u>                         | <b>SE 786 .</b>                | <b>SE.4</b>           |
|    | <u>Schneidstempel, zylindrischer Kopf Type K</u>  | <u>Punches, cylindrical head Type K</u>   | <b>SE 712</b>                  | <b>SE.5</b>           |
|    | <u>Schneidstempel, zylindrischer Kopf Type K ISO 8020</u>   | <u>Punches, cylindrical head Type K ISO 8020</u>  | <b>SE 712 ISO</b>              | <b>SE.6</b>           |
|    | <u>Schneidstempel ISO 8020 mit federndem Auswerferstift</u>   | <u>Punches ISO 8020 with spring ejector</u>   | <b>SE 737</b>                  | <b>SE.7</b>           |
|    | <u>Schneidstempel ISO 8020, Type KP, abgesetzter Schaft</u>   | <u>Punches ISO 8020, type KP, shouldered shank</u>  | <b>SE 716 KP ISO</b>           | <b>SE.8</b>           |
|   | <u>Schneidstempel ISO 8020 mit federndem Auswerferstift, Type EKP</u>   | <u>Punches ISO 8020 with spring ejector Type EKP</u>  | <b>SE 737 EKP</b>              | <b>SE.9</b>           |
|  | <u>Schneidstempel ISO 8020, Type KF, KO, KR, KS, abgesetzter Schaft</u>                                       | <u>Punches ISO 8020, type KF, KO, KR, KS, shouldered shank</u>                              | <b>SE 731 . . ISO</b>          | <b>SE.10</b>          |
|  | <u>Schneidstempel ISO 8020 mit federndem Auswerferstift Typen EKF, EKO, EKR, EKS</u>                          | <u>Punches ISO 8020 with spring ejector Types EKF, EKO, EKR, EKS</u>                        | <b>SE 737 . . .</b>            | <b>SE.11</b>          |
|  | <u>Stempelhalteplatten für Schneidstempel ISO 8020</u>  | <u>Triangle retainers for punches ISO 8020</u>  | <b>SE 391</b>                  | <b>SE.12</b>          |
|  | <u>Druckplatten für Stempelhalteplatten SE 391</u>  | <u>Thrust plates for triangle retainers SE 391</u>  | <b>SE 392</b>                  | <b>SE.13</b>          |
|  | <u>Schneidstempel Posaunenhals</u>  | <u>Punches trumpet head</u>   | <b>SE 750</b>                  | <b>SE.14</b>          |
|  | <u>Schneidstempel Posaunenhals mit federndem Auswerferstift</u>   | <u>Punches trumpet head with spring ejector</u>   | <b>SE 753</b>                  | <b>SE.15</b>          |
|  | <u>Schneidstempel Posaunenhals, abgesetzter Schaft</u>  | <u>Punches trumpet head, shouldered shank</u>   | <b>SE 751</b>                  | <b>SE.16</b>          |
|  | <u>Schneidstempel Posaunenhals, abgesetzter Schaft, mit federndem Auswerferstift</u>                          | <u>Punches trumpet head, shouldered shank with spring ejector</u>                           | <b>SE 754</b>                  | <b>SE.17</b>          |
|  | <u>Schneidstempel Posaunenhals, abgesetzter Schaft, Typen PF, PO, PR, PS</u>                                  | <u>Punches trumpet head, shouldered shank Types PF, PO, PR, PS</u>                          | <b>SE 752 . .</b>              | <b>SE.18</b>          |
|  | <u>Schneidstempel Posaunenhals abgesetzter Schaft, mit federndem Auswerferstift, Typen EPF, EPO, EPR, EPS</u> | <u>Punches trumpet head, shouldered shank with spring ejector, Types EPF, EPO, EPR, EPS</u> | <b>SE 755 . . .</b>            | <b>SE.19</b>          |
|  | <u>Kopfsenker für Posaunenhals-Stempel</u>  | <u>Counterbore-tools for trumpet-heads</u>  | <b>SE 020</b>                  | <b>SE.20</b>          |
|  | <u>Fangstifte</u>   | <u>Pilot punches</u>  | <b>SE 709</b>                  | <b>SE.21</b>          |

SCHNEIDELEMENTE / CUTTING ELEMENTS


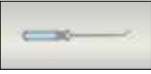


|     | <b>Schneidstempel</b>   | <b>Punches</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
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|    | <u>Schneidstempel 30° Kopf</u>  | <u>Punches 30° head</u>  | <b>SE 730</b>                  | <b>SE.22</b>          |
|    | <u>Schneidstempel 30° Kopf mit federndem Auswerferstift</u>   | <u>Punches 30° head with spring ejector</u>  | <b>SE 734</b>                  | <b>SE.23</b>          |
|    | <u>Schneidstempel 30° Kopf, abgesetzter Schaft</u>  | <u>Punches 30° head, shouldered shank</u>  | <b>SE 732</b>                  | <b>SE.24</b>          |
|    | <u>Schneidstempel 30° Kopf, abgesetzter Schaft mit federndem Auswerferstift</u>                           | <u>Punches 30° head, shouldered shank with spring ejector</u>                          | <b>SE 735</b>                  | <b>SE.25</b>          |
|    | <u>Schneidstempel 30° Kopf, abgesetzter Schaft, Typen 30F, 30O, 30R, 30S</u>                              | <u>Punches 30° head, shouldered shank Types 30F, 30O, 30R, 30S</u>                     | <b>SE 733 ...</b>              | <b>SE.26</b>          |
|    | <u>Schneidstempel 30° Kopf, abgesetzter Schaft, Typen 30F, 30O, 30R, 30S mit federndem Auswerferstift</u> | <u>Punches 30° head, shouldered shank Types 30F, 30O, 30R, 30S with spring ejector</u> | <b>SE 736 ...</b>              | <b>SE.27</b>          |
|    | <u>Schneidstempel mit Langlochprofil über die Gesamtlänge, mit Senkkopf</u>                               | <u>Punches with oblong shape over the total length with countersunk head</u>           | <b>SE 744<br/>SE 745</b>       | <b>SE.28</b>          |
|   | <u>Schneidstempel mit Rechteckprofil über die Gesamtlänge, mit Senkkopf</u>                               | <u>Punches with rectangular shape over the total length with countersunk head</u>      | <b>SE 748<br/>SE 749</b>       | <b>SE.29</b>          |
|  | <u>Schneidstempel mit Rechteckprofil über die Gesamtlänge</u>   | <u>Punches with rectangular shape over the total length</u>                            | <b>SE 738<br/>SE 739</b>       | <b>SE.30</b>          |
|  | <u>Schneidstempel mit Langlochprofil über die Gesamtlänge</u>   | <u>Punches with oblong shape over the total length</u>                                 | <b>SE 740<br/>SE 741</b>       | <b>SE.31</b>          |
|  | <u>Verdrehsicherung für Schneidstempel Information</u>  | <u>Rotation prevention for punches Information</u>                                     |                                | <b>SE.58</b>          |



|   | <b>Schneidbuchsen</b>   | <b>Die buttons</b>  | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|---|---|--------------------------------|-----------------------|
|  | <u>Schneidbuchsen DIN 9845, Form A ohne Bund</u>                                      | <u>Die buttons DIN 9845 A without collar</u>                            | <b>SE 791</b>                  | <b>SE.32</b>          |
|  | <u>Schneidbuchsen DIN 9845, Form B mit Bund</u>                                       | <u>Die buttons DIN 9845 B with collar</u>                               | <b>SE 792</b>                  | <b>SE.33</b>          |
|  | <u>Schneidbuchsen ohne Bund Type ED, ISO 8977A</u>                                    | <u>Die buttons without collar Type ED, ISO 8977A</u>                    | <b>SE 711 ED</b>               | <b>SE.34</b>          |
|  | <u>Schneidbuchsen mit Bund Type EKD, ISO 8977B</u>                                    | <u>Die buttons with collar Type EKD, ISO 8977B</u>                      | <b>SE 713 EKD</b>              | <b>SE.35</b>          |
|  | <u>Schneidbuchsen ohne Bund, Typen EDF, EDO, EDR, EDS, ISO 8977A</u>                  | <u>Die buttons without collar Types EDF, EDO, EDR, EDS, ISO 8977A</u>   | <b>SE 715 ...</b>              | <b>SE.36</b>          |
|  | <u>Schneidbuchsen mit Bund Typen EKDF, EKDO, EKDR, EKDS, ISO 8977B</u>                | <u>Die buttons with collar Types EKDF, EKDO, EKDR, EKDS, ISO 8977B</u>  | <b>SE 717 ...</b>              | <b>SE.37</b>          |
|  | <u>Schneidbuchsen mit Startlochbohrung durchgehend, Type EDL, ohne Bund ISO 8977A</u> | <u>Die buttons with start hole, Type EDL, without collar, ISO 8977A</u> | <b>SE 711 EDL</b>              | <b>SE.38</b>          |

|  | <b>Schneidbuchsen</b>  | <b>Die buttons</b>  | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
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|  | <u>Schneidbuchsen mit Startlochbohrung durchgehend, Type EKDL, mit Bund ISO 8977B</u>      | <u>Die buttons with start hole, Type EKDL, with collar, ISO 8977B</u>                           | <b>SE 713 EKDL</b>             | <b>SE.39</b>          |
|  | <u>Schneidbuchsen mit Startlochbohrung und Ausfallloch, Type EDM, ohne Bund, ISO 8977A</u> | <u>Die buttons with start hole and counter-bore relief, Type EDM, without collar, ISO 8977A</u> | <b>SE 711 EDM</b>              | <b>SE.40</b>          |
|  | <u>Schneidbuchsen mit Startlochbohrung und Ausfallloch, Type EKDM, mit Bund, ISO 8977B</u> | <u>Die buttons with start hole and counter-bore relief, Type EKDM, with collar, ISO 8977B</u>   | <b>SE 713 EKDM</b>             | <b>SE.41</b>          |
|  | <u>Stempelführungsbuchsen DIN 9845, Form C</u>   | <u>Punch - guide bushings, DIN 9845 C</u>   | <b>SE 793</b>                  | <b>SE.42</b>          |
|  | <u>Verdrehsicherung für Schneidbuchsen Information</u>                                     | <u>Rotation prevention for die buttons Information</u>  |                                | <b>SE.58</b>          |

|    | <b>Schnellwechsel-Schneidelemente</b>   | <b>Ball lock cutting elements</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
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|   | <u>Schnellwechsel-Schneidstempel, schwere Ausführung</u>  | <u>Ball lock punches, heavy duty</u>  | <b>SE 300</b>                  | <b>SE.44</b>          |
|  | <u>Schnellwechsel-Schneidstempel, schwere Ausführung, mit federndem Auswerferstift</u>                                | <u>Ball lock punches, heavy duty, with spring ejector</u>                                     | <b>SE 320</b>                  | <b>SE.45</b>          |
|  | <u>Schnellwechsel-Schneidstempel, schwere Ausführung, abgesetzter Schaft</u>  | <u>Ball lock punches, heavy duty, shouldered shank</u>  | <b>SE 301</b>                  | <b>SE.46</b>          |
|  | <u>Schnellwechsel-Schneidstempel, schwere Ausführung, abgesetzter Schaft, mit federndem Auswerferstift</u>            | <u>Ball lock punches, heavy duty, shouldered shank, with spring ejector</u>                   | <b>SE 321</b>                  | <b>SE.47</b>          |
|  | <u>Schnellwechsel-Schneidstempel, schwere Ausführung, abgesetzter Schaft Typen O, S, H, L</u>                         | <u>Ball lock punches, heavy duty, shouldered shank Types O, S, H, L</u>                       | <b>SE 302 .</b>                | <b>SE.48</b>          |
|  | <u>Schnellwechsel-Schneidstempel, schwere Ausführung, abgesetzter Schaft Typen O, S, H, L, mit fed. Auswerferst.</u>  | <u>Ball lock punches, heavy duty, shouldered shank, with spring ejector Types O, S, H, L,</u> | <b>SE 322 .</b>                | <b>SE.49</b>          |
|  | <u>Schnellwechsel-Schneidstempel, schwere Ausführung, Schneide &gt; Schaft</u>  | <u>Ball lock punches, heavy duty, inverted</u>  | <b>SE 303</b>                  | <b>SE.50</b>          |
|  | <u>Schnellwechsel-Schneidstempel, schwere Ausführung, Schneide &gt; Schaft, mit federndem Auswerferstift</u>          | <u>Ball lock punches, heavy duty, inverted, with spring ejector</u>                           | <b>SE 323</b>                  | <b>SE.51</b>          |
|  | <u>Schnellwechsel-Schneidstempel, schwere Ausführung, Schneide &gt; Schaft, Typen O, S, H, L</u>                      | <u>Ball lock punches, heavy duty, inverted, Types O, S, H, L</u>                              | <b>SE 304 .</b>                | <b>SE.52</b>          |
|  | <u>Schnellwechsel-Schneidstempel, schw. Ausführung, Schneide &gt; Schaft, Typen O, S, H, L, mit fed. Auswerferst.</u> | <u>Ball lock punches, heavy duty, inverted, Types O, S, H, L, with spring ejector</u>         | <b>SE 324 .</b>                | <b>SE.53</b>          |
|  | <u>Schnellwechsel-Schneidbuchsen, leichte Ausführung, rund</u>  | <u>Ball lock die buttons, light duty, round</u>   | <b>SE 340</b>                  | <b>SE.54</b>          |
|  | <u>Schnellwechsel-Schneidbuchsen, leichte Ausführung, Profile, Typen O, S, H, L</u>                                   | <u>Ball lock die buttons, light duty, profiles, Types O, S, H, L</u>                          | <b>SE 341 .</b>                | <b>SE.55</b>          |
|  | <u>Stempelhalteplatten für Schnellwechsel-Schneidstempel</u>  | <u>Triangle retainers for ball lock punches</u>   | <b>SE 390</b>                  | <b>SE.56</b>          |

SCHNEIDELEMENTE / CUTTING ELEMENTS

|   | <b>Zubehör Bereich<br/>Schneidelemente</b>                                    | <b>Accessories</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
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|  | <u>Entrigelungswerkzeuge für Stempelhalteplatten, abgewinkelte Ausführung</u> | <u>Release tools for ball lock punch retainers, angular</u>  | <b>SE 360</b>                  | <b>SE.57</b>          |
|  | <u>Entrigelungswerkzeuge für Stempelhalteplatten, gerade Ausführung</u>       | <u>Release tools for ball lock punch retainers, straight</u> | <b>SE 361</b>                  | <b>SE.57</b>          |
|  | <u>Entrigelungswerkzeuge für Stempelhalteplatten, Gewindeausführung</u>       | <u>Release tools for ball lock punch retainers, threaded</u> | <b>SE 362</b>                  | <b>SE.57</b>          |

|    | <b>Sonderschneid-<br/>elemente</b>             | <b>Special punches</b>                             | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b>  |
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|  | <u>Bestellbeispiele</u>                        | <u>Ordering examples</u>                           |                                | <b>SE.59</b>           |
|  | <u>Bestellformulare</u>                        | <u>Order forms</u>                                 |                                | <b>SE.60<br/>SE.61</b> |
|  | <u>Formbeispiele für Sonderschneidelemente</u> | <u>Shape examples for special cutting elements</u> |                                | <b>SE.43</b>           |

[SE]

# Schneidstempel DIN 9861, Form D

## Punches DIN 9861, Form D



SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 775

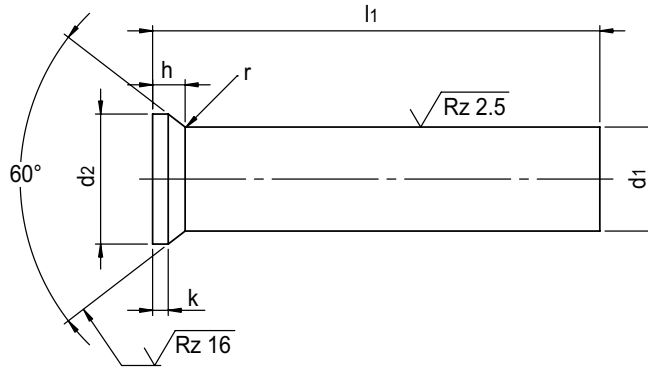
Mat.: HSS  
 Härte Schaft: 64 ±2 HRC  
 Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
 Hardness shank: 64 ±2 HRC  
 Head: 50 ±5 HRC

SE 775 / 2,50 x 100

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Punches with rotation prevention available, please specify when ordering.



| d1<br>h6 | d2<br>±0,05 | h<br>+0,2 | k<br>+0,2 | r       | l1<br>+0,5 |    |     |     |
|----------|-------------|-----------|-----------|---------|------------|----|-----|-----|
|          |             |           |           |         | 71         | 80 | 100 | 130 |
| 0,50     | 0,9         | 0,55      | 0,2       | 0,2+0,2 | ●          | ●  | ●   |     |
| 0,55     | 1,0         | 0,59      | 0,2       | 0,2+0,2 | ●          | ●  | ●   |     |
| 0,60     | 1,1         | 0,63      | 0,2       | 0,2+0,2 | ●          | ●  | ●   |     |
| 0,65     | 1,2         | 0,68      | 0,2       | 0,2+0,2 | ●          | ●  | ●   |     |
| 0,70     | 1,3         | 0,72      | 0,2       | 0,2+0,2 | ●          | ●  | ●   |     |
| 0,75     | 1,3         | 0,68      | 0,2       | 0,2+0,2 | ●          | ●  | ●   |     |
| 0,80     | 1,4         | 0,92      | 0,4       | 0,2+0,2 | ●          | ●  | ●   |     |
| 0,85     | 1,4         | 0,88      | 0,4       | 0,2+0,2 | ●          | ●  | ●   |     |
| 0,90     | 1,6         | 1,01      | 0,4       | 0,2+0,2 | ●          | ●  | ●   |     |
| 0,95     | 1,6         | 0,96      | 0,4       | 0,2+0,2 | ●          | ●  | ●   |     |
| 1,00     | 1,8         | 1,19      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 1,10     | 1,8         | 1,11      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 1,20     | 2,0         | 1,19      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 1,30     | 2,0         | 1,11      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 1,40     | 2,2         | 1,19      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 1,50     | 2,2         | 1,11      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 1,60     | 2,5         | 1,28      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 1,70     | 2,5         | 1,19      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 1,80     | 2,8         | 1,37      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 1,90     | 2,8         | 1,28      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,00     | 3,0         | 1,37      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,10     | 3,2         | 1,45      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,20     | 3,2         | 1,37      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,30     | 3,5         | 1,54      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,40     | 3,5         | 1,45      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,50     | 3,5         | 1,37      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,60     | 4,0         | 1,71      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,70     | 4,0         | 1,63      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,80     | 4,0         | 1,54      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 2,90     | 4,0         | 1,45      | 0,5       | 0,4+0,3 | ●          | ●  | ●   |     |
| 3,00     | 4,5         | 1,80      | 0,5       | 0,6+0,4 | ●          | ●  | ●   |     |
| 3,10     | 4,5         | 1,71      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 3,20     | 4,5         | 1,63      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 3,30     | 4,5         | 1,54      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 3,40     | 4,5         | 1,45      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 3,50     | 5,0         | 1,80      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 3,60     | 5,0         | 1,71      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 3,70     | 5,0         | 1,63      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 3,80     | 5,0         | 1,54      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 3,90     | 5,0         | 1,45      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 4,00     | 5,5         | 1,80      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 4,10     | 5,5         | 1,71      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 4,20     | 5,5         | 1,63      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 4,30     | 5,5         | 1,54      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 4,40     | 5,5         | 1,45      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 4,50     | 6,0         | 1,80      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 4,60     | 6,0         | 1,71      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 4,70     | 6,0         | 1,63      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |

[SE]

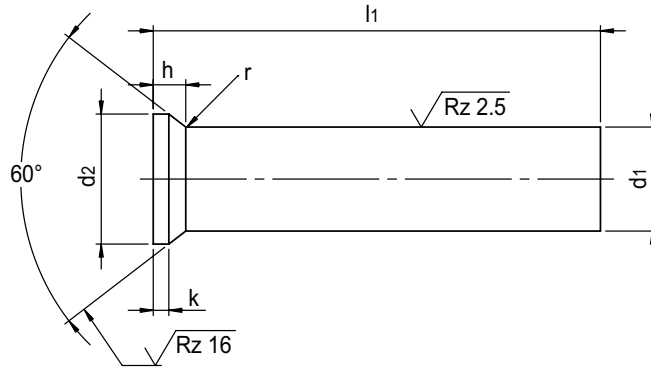
SE 775

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

SE 775 / 2,50 x 100

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).



Punches with rotation prevention available, please specify when ordering.



| d1<br>h6 | d2<br>±0,05 | h<br>+0,2 | k<br>+0,2 | r       | l1<br>+0,5 |    |     |     |
|----------|-------------|-----------|-----------|---------|------------|----|-----|-----|
|          |             |           |           |         | 71         | 80 | 100 | 130 |
| 4,80     | 6,0         | 1,54      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 4,90     | 6,0         | 1,45      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,00     | 6,5         | 1,80      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,10     | 6,5         | 1,71      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,20     | 6,5         | 1,63      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,30     | 6,5         | 1,54      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,40     | 6,5         | 1,45      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,50     | 7,0         | 1,80      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,60     | 7,0         | 1,71      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,70     | 7,0         | 1,63      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,80     | 7,0         | 1,54      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 5,90     | 7,0         | 1,45      | 0,5       | 0,6+0,4 | ●          | ●  | ●   | ●   |
| 6,00     | 8,0         | 2,23      | 0,5       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 6,10     | 8,0         | 2,15      | 0,5       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 6,20     | 8,0         | 2,06      | 0,5       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 6,30     | 8,0         | 1,97      | 0,5       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 6,40     | 8,0         | 1,89      | 0,5       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 6,50     | 9,0         | 3,17      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 7,00     | 9,0         | 2,73      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 7,50     | 10,0        | 3,17      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 8,00     | 10,0        | 2,73      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 8,50     | 11,0        | 3,17      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 9,00     | 11,0        | 2,73      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 9,50     | 12,0        | 3,17      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 10,00    | 12,0        | 2,73      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 10,50    | 13,0        | 3,17      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 11,00    | 13,0        | 2,73      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 11,50    | 14,0        | 3,17      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 12,00    | 14,0        | 2,73      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 12,50    | 15,0        | 3,17      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 13,00    | 15,0        | 2,73      | 1,0       | 1,0+0,5 | ●          | ●  | ●   | ●   |
| 13,50    | 16,0        | 3,67      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 14,00    | 16,0        | 3,23      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 14,50    | 17,0        | 3,67      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 15,00    | 17,0        | 3,23      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 15,50    | 18,0        | 3,67      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 16,00    | 18,0        | 3,23      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 16,50    | 19,0        | 3,67      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 17,00    | 19,5        | 3,23      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 17,50    | 20,0        | 3,67      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 18,00    | 20,5        | 3,23      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 18,50    | 21,0        | 3,67      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 19,00    | 21,5        | 3,23      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 19,50    | 22,0        | 3,67      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |
| 20,00    | 22,5        | 3,23      | 1,5       | 1,5+0,5 | ●          | ●  | ●   | ●   |



# Schneidstempel DIN 9861, Form C, abgesetzter Schaft

## Punches DIN 9861, Form C, shouldered shank



SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 785

Mat.: HSS  
 Härte Schaft: 64 ±2 HRC  
 Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
 Hardness shank: 64 ±2 HRC  
 Head: 50 ±5 HRC

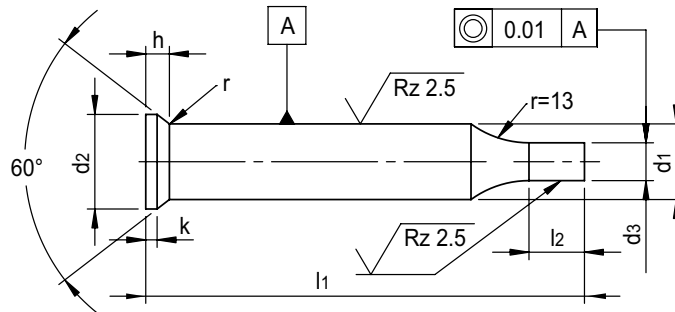
SE 785 /  
 5,0 x 71 / d3

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Länge l2 frei wählbar!  
 Fehlende Maße siehe SE 775 (Seite SE.1)

Length l2 freely selectable!  
 for missing dimensions please see SE 775 (page SE.1)

Punches with rotation prevention available, please specify when ordering.



| d1<br>h6 | d3<br>h6<br>Stufung/step<br>0,01 | l2<br>+0,5 | l1<br>+0,5 |    |     |     |
|----------|----------------------------------|------------|------------|----|-----|-----|
|          |                                  |            | 71         | 80 | 100 | 130 |
| 1,5      | 0,5 - 1,4                        | 7          | ●          | ●  | ●   |     |
| 2,0      | 0,5 - 1,9                        | 7          | ●          | ●  | ●   |     |
| 3,0      | 1,6 - 2,9                        | 7          | ●          | ●  | ●   |     |
| 4,0      | 1,6 - 3,9                        | 10         | ●          | ●  | ●   | ●   |
| 5,0      | 2,5 - 4,9                        | 10         | ●          | ●  | ●   | ●   |
| 6,0      | 3,0 - 5,9                        | 10         | ●          | ●  | ●   | ●   |
| 8,0      | 4,0 - 7,9                        | 13         | ●          | ●  | ●   | ●   |
| 10,0     | 5,0 - 9,9                        | 17         | ●          | ●  | ●   | ●   |
| 13,0     | 9,0 - 12,9                       | 17         | ●          | ●  | ●   | ●   |
| 16,0     | 12,0 - 15,9                      | 17         | ●          | ●  | ●   | ●   |
| 20,0     | 16,0 - 19,9                      | 17         | ●          | ●  | ●   | ●   |
| 25,0     | 20,0 - 24,9                      | 17         | ●          | ●  | ●   | ●   |
| 32,0     | 25,0 - 31,9                      | 17         | ●          | ●  | ●   | ●   |
| 38,0     | 30,0 - 37,9                      | 17         | ●          | ●  | ●   | ●   |

[SE]



SE 786 .

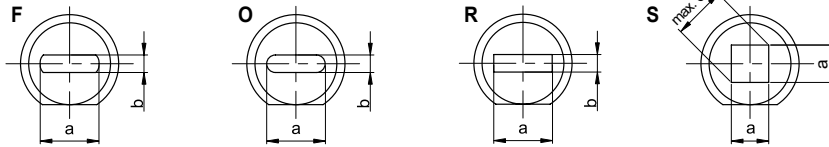
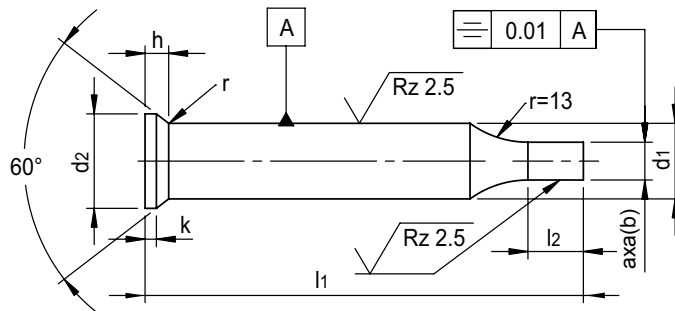
Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

SE 786 F /  
8 x 80 / a x b

Länge l2 frei wählbar!  
Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).  
Fehlende Maße siehe SE 775 (Seite SE.1)

Length l2 freely selectable!  
Punches without rotation prevention available, please specify when ordering.  
For missing dimensions please see SE 775 (page SE.1)




| d1<br>h6 | a x b<br>±0,01<br>Stufung/step<br>0,01<br>≥ ≤ | l2<br>+0,5 | l1<br>+0,5 |    |     |     |
|----------|---|------------|------------|----|-----|-----|
|          |   |            | 71         | 80 | 100 | 130 |
| 5        | 2,5 - 4,9                                     | 10         | ●          | ●  | ●   | ●   |
| 6        | 3,0 - 5,9                                     | 10         | ●          | ●  | ●   | ●   |
| 8        | 4,0 - 7,9                                     | 13         | ●          | ●  | ●   | ●   |
| 10       | 5,0 - 9,9                                     | 17         | ●          | ●  | ●   | ●   |
| 13       | 9,0 - 12,9                                    | 17         | ●          | ●  | ●   | ●   |
| 16       | 12,0 - 15,9                                   | 17         | ●          | ●  | ●   | ●   |
| 20       | 16,0 - 19,9                                   | 17         | ●          | ●  | ●   | ●   |
| 25       | 20,0 - 24,9                                   | 17         | ●          | ●  | ●   | ●   |
| 32       | 27,0 - 31,9                                   | 17         | ●          | ●  | ●   | ●   |
| 38       | 33,0 - 37,9                                   | 17         | ●          | ●  | ●   | ●   |



SE 712

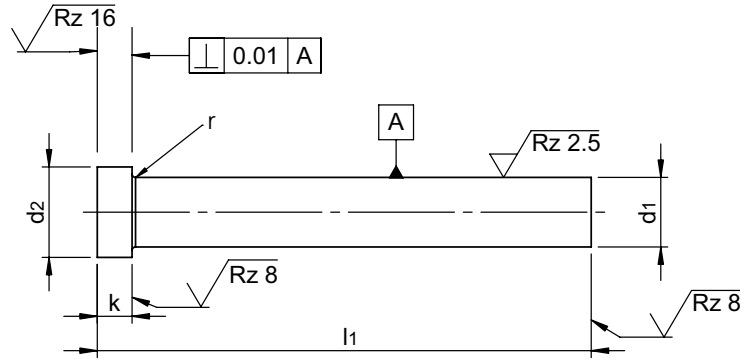
Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

 SE 712 / 8 x 80

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Punches with rotation prevention available, please specify when ordering.



[SE]

| d1<br>m5 | d2<br>-0,15 | k<br>+0,2<br>+0,1 | r<br>+0,1 | l1<br>+0,5<br>+0,2 |    |    |    |     |     |
|----------|-------------|-------------------|-----------|--------------------|----|----|----|-----|-----|
|          |             |                   |           | 63                 | 71 | 80 | 90 | 100 | 120 |
| 3        | 5           | 3                 | 0,2       | ●                  | ●  | ●  | ●  |     |     |
| 4        | 6           | 3                 | 0,2       | ●                  | ●  | ●  | ●  | ●   |     |
| 5        | 8           | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 6        | 9           | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 8        | 11          | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 10       | 13          | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 13       | 16          | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 16       | 19          | 6                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 20       | 24          | 6                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 25       | 29          | 10                | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 32       | 36          | 12                | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 38       | 45          | 15                | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |



SE 712 ISO

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

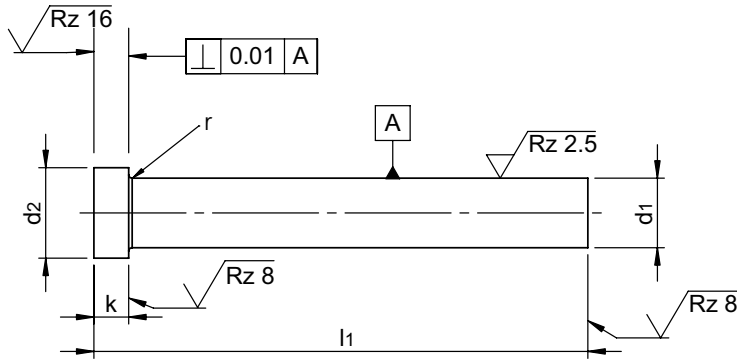
SE 712 ISO / 8 x 80

Stempel mit verstärkter Kopfhöhe auf Wunsch lieferbar (bei Bestellung angeben).

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Punches with rotation prevention available, please specify when ordering.

Punches with reinforced head height available, please specify when ordering.



| d1<br>m5 | d2<br>-0,15 | k<br>+0,2<br>+0,1 | r<br>+0,1 | l1<br>+0,5<br>+0,2 |    |    |    |     |     |
|----------|-------------|-------------------|-----------|--------------------|----|----|----|-----|-----|
|          |             |                   |           | 63                 | 71 | 80 | 90 | 100 | 120 |
| 3        | 5           | 3                 | 0,2       | ●                  | ●  | ●  | ●  |     |     |
| 4        | 6           | 3                 | 0,2       | ●                  | ●  | ●  | ●  | ●   |     |
| 5        | 8           | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 6        | 9           | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 8        | 11          | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 10       | 13          | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 13       | 16          | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 16       | 19          | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 20       | 23          | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 25       | 28          | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 32       | 35          | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 38       | 41          | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |



SE 737

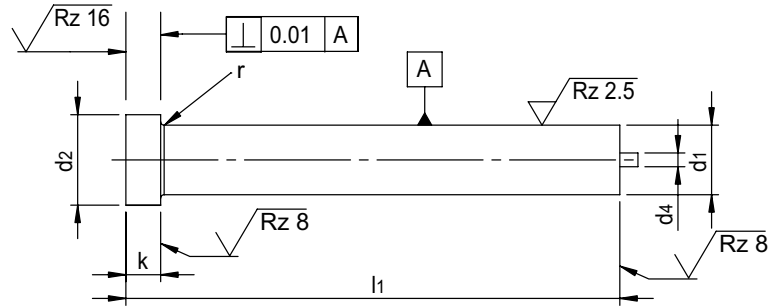
Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

SE 737 / 10 x 100

Stempel mit Verdrehungssicherung auf Wunsch lieferbar (bei Bestellung angeben).

Punches with rotation prevention available, please specify when ordering.



| d1<br>m5 | d2<br>-0,05 | d4  | k<br>+0,2<br>+0,1 | r<br>+0,1 | l1<br>+0,5<br>+0,2 |    |    |    |     |     |
|----------|-------------|-----|-------------------|-----------|--------------------|----|----|----|-----|-----|
|          |             |     |                   |           | 63                 | 71 | 80 | 90 | 100 | 120 |
| 5        | 8           | 1,0 | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   |     |
| 6        | 9           | 1,0 | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   |     |
| 8        | 11          | 1,5 | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 10       | 13          | 1,5 | 5                 | 0,3       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 13       | 16          | 1,5 | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 16       | 19          | 2,3 | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 20       | 23          | 2,3 | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 25       | 28          | 2,3 | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 32       | 35          | 3,0 | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |
| 38       | 41          | 3,0 | 5                 | 0,5       | ●                  | ●  | ●  | ●  | ●   | ●   |

[SE]



### SE 716 KP ISO

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

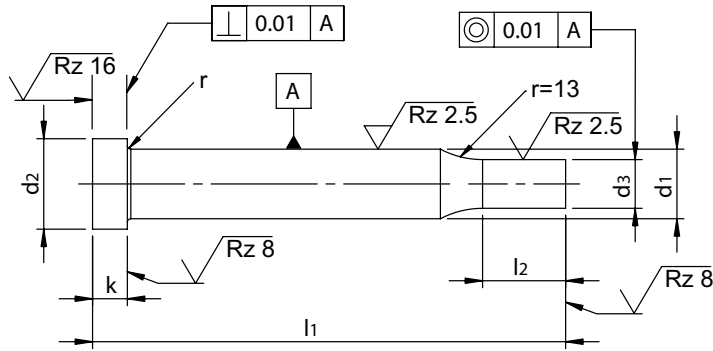
SE 716 KP / ISO /  
10 x 100 / d3

Stempel mit verstärkter Kopfhöhe auf Wunsch lieferbar (bei Bestellung angeben).

Länge l2 frei wählbar!  
Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Length l2 freely selectable!  
Punches with rotation prevention available, please specify when ordering.

Punches with reinforced head height available, please specify when ordering.



| d1<br>m5 | d2<br>-0,15 | d3<br>+0,01<br>Stufung/step<br>0,01 | k<br>+0,2<br>+0,1 | r<br>+0,1 | l2<br>±0,5 | l1<br>+0,5<br>+0,2 |    |    |    |     |     |
|----------|-------------|-------------------------------------|-------------------|-----------|------------|--------------------|----|----|----|-----|-----|
|          |             |                                     |                   |           |            | 63                 | 71 | 80 | 90 | 100 | 120 |
| 3        | 5           | 1,6 - 2,9                           | 3                 | 0,2       | 7          | ●                  | ●  | ●  | ●  |     |     |
| 4        | 6           | 1,6 - 3,9                           | 3                 | 0,2       | 10         | ●                  | ●  | ●  | ●  | ●   |     |
| 5        | 8           | 2,5 - 4,9                           | 5                 | 0,3       | 10         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 6        | 9           | 3,0 - 5,9                           | 5                 | 0,3       | 10         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 8        | 11          | 4,0 - 7,9                           | 5                 | 0,3       | 13         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 10       | 13          | 5,0 - 9,9                           | 5                 | 0,3       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 13       | 16          | 9,0 - 12,9                          | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 16       | 19          | 12,0 - 15,9                         | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 20       | 23          | 16,0 - 19,9                         | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 25       | 28          | 20,0 - 24,9                         | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 32       | 35          | 27,0 - 31,9                         | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 38       | 41          | 33,0 - 37,9                         | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |



SE 737 EKP

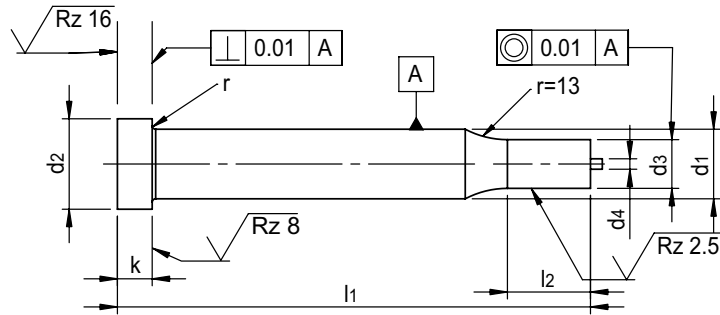
Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

SE 737 EKP /  
10 x 100 / d3

Länge l2 frei wählbar!  
Stempel mit Verdrehsicherung auf  
Wunsch lieferbar (bei Bestellung  
angeben).

Length l2 freely selectable!  
Punches with rotation prevention  
available, please specify when  
ordering.



[SE]

| d1<br>m5 | d2<br>-0,15 | d3<br>+0,01<br>Stufung/step<br>0,01 | d4  | k<br>+0,2<br>+0,1 | r<br>+0,1 | l2<br>±0,5 | l1<br>+0,5<br>+0,2 |    |    |    |     |     |
|----------|-------------|-------------------------------------|-----|-------------------|-----------|------------|--------------------|----|----|----|-----|-----|
|          |             |                                     |     |                   |           |            | 63                 | 71 | 80 | 90 | 100 | 120 |
| 5        | 8           | 2,5 - 4,9                           | 1,0 | 5                 | 0,3       | 10         | ●                  | ●  | ●  | ●  | ●   |     |
| 6        | 9           | 3,0 - 5,9                           | 1,0 | 5                 | 0,3       | 10         | ●                  | ●  | ●  | ●  | ●   |     |
| 8        | 11          | 4,0 - 7,9                           | 1,5 | 5                 | 0,3       | 13         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 10       | 13          | 5,0 - 9,9                           | 1,5 | 5                 | 0,3       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 13       | 16          | 9,0 - 12,9                          | 1,5 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 16       | 19          | 12,0 - 15,9                         | 2,3 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 20       | 23          | 16,0 - 19,9                         | 2,3 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 25       | 28          | 20,0 - 24,9                         | 2,3 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 32       | 35          | 24,0 - 31,9                         | 3,0 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 38       | 41          | 28,0 - 37,9                         | 3,0 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |



SE 731 . . ISO

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

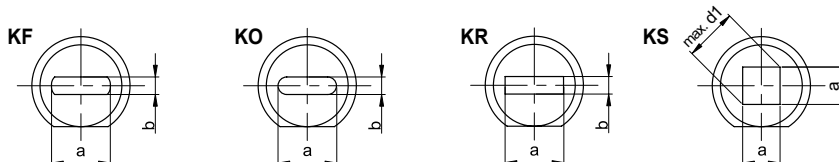
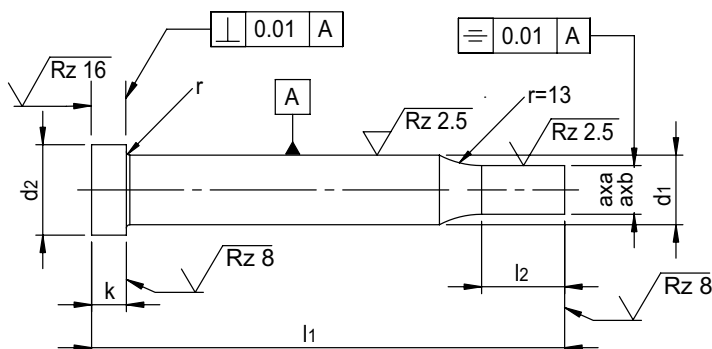
SE 731 KO / ISO /  
10 x 100 / a x b

Stempel mit verstärkter Kopfhöhe auf Wunsch lieferbar (bei Bestellung angeben).

Länge l2 frei wählbar!  
Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Length l2 freely selectable!  
Punches without rotation prevention available, please specify when ordering.

Punches with reinforced head height available, please specify when ordering.



| d1<br>m5 | a x b<br>±0,01<br>Stufung/step<br>0,01<br>≥ ≤ | d2<br>-0,15 | k<br>+0,2<br>+0,1 | r<br>+0,1 | l2<br>±0,5 | l1<br>+0,5<br>+0,2 |    |    |    |     |     |
|----------|---|-------------|-------------------|-----------|------------|--------------------|----|----|----|-----|-----|
|          |   |             |                   |           |            | 63                 | 71 | 80 | 90 | 100 | 120 |
| 3        | 1,6 - 2,9                                     | 5           | 3                 | 0,2       | 7          | ●                  | ●  | ●  | ●  |     |     |
| 4        | 1,6 - 3,9                                     | 6           | 3                 | 0,2       | 10         | ●                  | ●  | ●  | ●  | ●   |     |
| 5        | 2,5 - 4,9                                     | 8           | 5                 | 0,3       | 10         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 6        | 3,0 - 5,9                                     | 9           | 5                 | 0,3       | 10         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 8        | 4,0 - 7,9                                     | 11          | 5                 | 0,3       | 13         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 10       | 5,0 - 9,9                                     | 13          | 5                 | 0,3       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 13       | 9,0 - 12,9                                    | 16          | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 16       | 12,0 - 15,9                                   | 19          | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 20       | 16,0 - 19,9                                   | 23          | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 25       | 20,0 - 24,9                                   | 28          | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 32       | 27,0 - 31,9                                   | 35          | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 38       | 33,0 - 37,9                                   | 41          | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |





SE 737 . . .

mit federndem Auswerferstift

with spring ejector

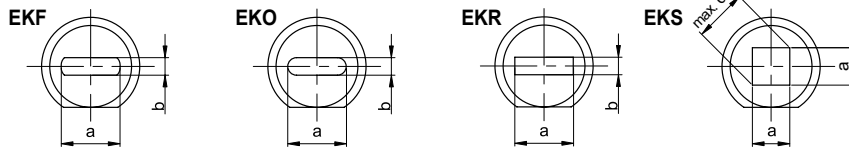
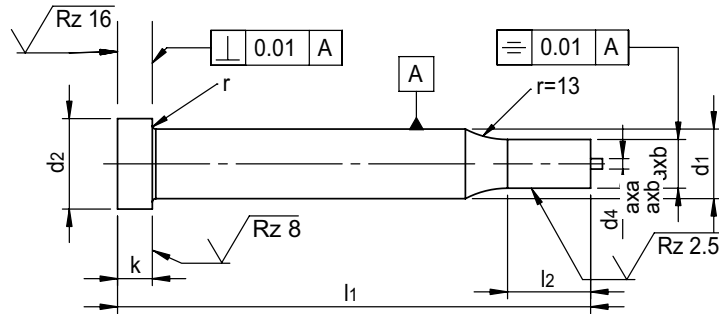
SE 737 EKF /  
10 x 100 / a x b

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

Länge l2 frei wählbar!  
Stempel ohne Verdrehsicherung auf  
Wunsch lieferbar (bei Bestellung  
angeben).

Length l2 freely selectable!  
Punches without rotation preventi-  
on available, please specify when  
ordering.



| d1<br>m5 | d2<br>-0,15 | a x b<br>±0,01<br>Stufung/step<br>0,01<br>≥ ≤ | d4  | k<br>+0,2<br>+0,1 | r<br>+0,1 | l2<br>±0,5 | l1<br>+0,5<br>+0,2 |    |    |    |     |     |
|----------|-------------|---|-----|-------------------|-----------|------------|--------------------|----|----|----|-----|-----|
|          |             |   |     |                   |           |            | 63                 | 71 | 80 | 90 | 100 | 120 |
| 5        | 8           | 2,5 - 4,9                                     | 1,0 | 5                 | 0,3       | 10         | ●                  | ●  | ●  | ●  | ●   |     |
| 6        | 9           | 3,0 - 5,9                                     | 1,0 | 5                 | 0,3       | 10         | ●                  | ●  | ●  | ●  | ●   |     |
| 8        | 11          | 4,0 - 7,9                                     | 1,6 | 5                 | 0,3       | 13         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 10       | 13          | 5,0 - 9,9                                     | 1,6 | 5                 | 0,3       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 13       | 16          | 9,0 - 12,9                                    | 1,6 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 16       | 19          | 12,0 - 15,9                                   | 2,4 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 20       | 23          | 16,0 - 19,9                                   | 2,4 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 25       | 28          | 20,0 - 24,9                                   | 2,4 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 32       | 35          | 24,0 - 31,9                                   | 2,4 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |
| 38       | 41          | 28,0 - 37,9                                   | 2,4 | 5                 | 0,5       | 17         | ●                  | ●  | ●  | ●  | ●   | ●   |

[SE]



SE 391

Schwere Ausführung  
mit Verdrehsicherung

Heavy duty  
with rotation prevention

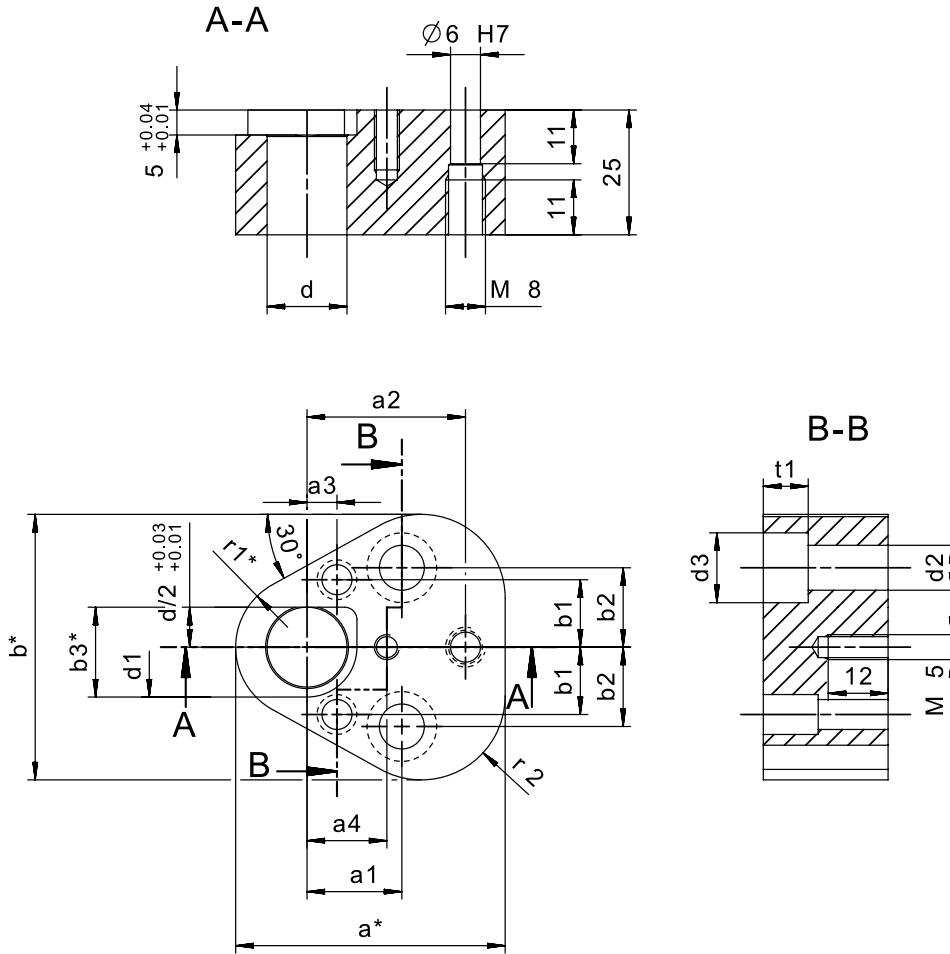
SE 391 / 13

Mat.: 1.7131, gegläht  
Härte: 56 ±2 HRC

Mat.: 1.7131, annealed  
Hardness: 56 ±2 HRC

Lieferumfang:  
Zylinderkopfschrauben und Zylinder-  
stifte

Included:  
Socket head cap screw and dowel  
pins



| d  | Toleranzen d<br>Tolerances d | d1 | d2   | d3 | t1 | a*<br>max. | a1   | a2<br>±0,01 | a3<br>±0,01 | a4 | b*<br>max. | b1<br>±0,01 | b2   | b3* | r1*  | r2   |
|----|------------------------------|----|------|----|----|------------|------|-------------|-------------|----|------------|-------------|------|-----|------|------|
| 10 | +0,011<br>+0,008             | 14 | 9    | 15 | 9  | 44,5       | 19   | 26,92       | 7,5         | 16 | 43,7       | 9           | 11,1 | 12  | 9,5  | 12   |
| 13 | +0,014<br>+0,010             | 17 | 9    | 15 | 9  | 50,8       | 19   | 29,97       | 6,5         | 16 | 50         | 12          | 14,3 | 15  | 12,7 | 15,2 |
| 16 | +0,014<br>+0,010             | 20 | 9    | 15 | 9  | 54         | 19   | 31,75       | 6           | 16 | 53,2       | 13,5        | 15,9 | 18  | 14,3 | 16,8 |
| 20 | +0,016<br>+0,011             | 24 | 11   | 18 | 11 | 60,3       | 19   | 33,53       | 5           | 23 | 59,5       | 16,5        | 17,5 | 22  | 17,5 | 20   |
| 25 | +0,016<br>+0,011             | 29 | 13,5 | 20 | 13 | 69,9       | 23,8 | 40,64       | 7           | 30 | 69,1       | 22          | 19,8 | 27  | 22,2 | 24,7 |
| 32 | +0,019<br>+0,013             | 36 | 13,5 | 20 | 13 | 69,9       | 23,8 | 40,64       | 7           | 30 | 69,1       | 22          | 19,8 | 34  | 22,2 | 24,7 |

\* Konturen können variieren. Größtmaße sind in der Tabelle angegeben.

\* Contours may vary. Maximum dimensions are given in the table.

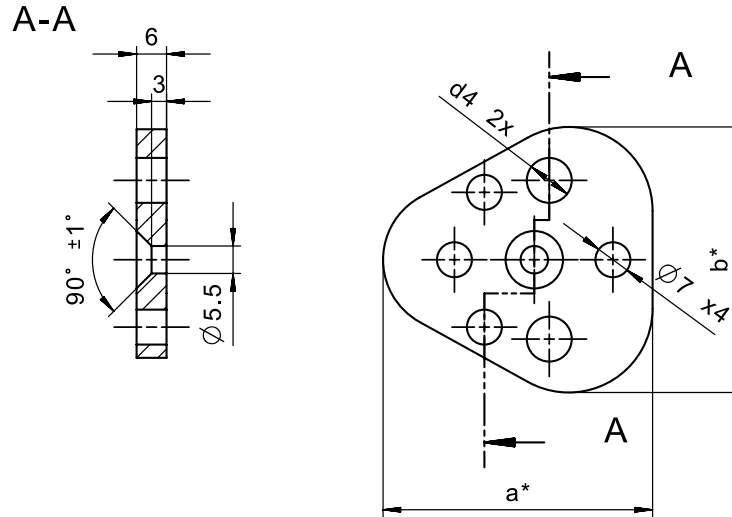


SE 392

Mat.: 1.2842  
Härte: 50 +3 HRC

Mat.: 1.2842  
Hardness: 50 +3 HRC

SE 392 / 13



| d<br>SE 391 | d4   | a*<br>max. | b*<br>max. |
|-------------|------|------------|------------|
| 10          | 9    | 44,5       | 43,7       |
| 13          | 9    | 50,8       | 50         |
| 16          | 9    | 54         | 53,2       |
| 20          | 11   | 60,3       | 59,5       |
| 25          | 13,5 | 69,9       | 69,1       |
| 32          | 13,5 | 69,9       | 69,1       |

\* Konturen können variieren. Größtmaße sind in der Tabelle angegeben.

\* Contours may vary. Maximum dimensions are given in the table.

### SE 750

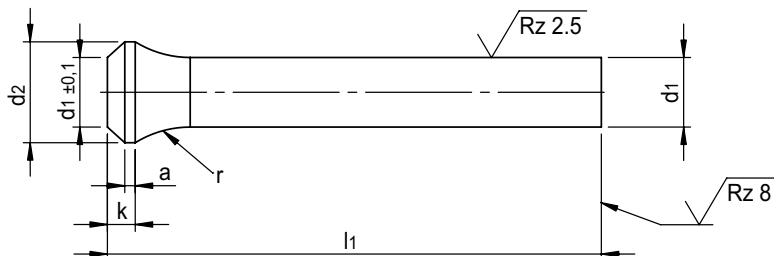
Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

SE 750 / 13,0 x 100

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Punches with rotation prevention available, please specify when ordering.



| d1<br>h6 | d2<br>-0,2 | k<br>+0,2 | a   | r<br>-0,2 | l1<br>+0,5 |    |    |     |     |
|----------|------------|-----------|-----|-----------|------------|----|----|-----|-----|
|          |            |           |     |           | 71         | 80 | 90 | 100 | 120 |
| 2,0      | 3,0        | 3         | 1,0 | 3,5       | ●          | ●  | ●  |     |     |
| 2,5      | 3,5        | 3         | 1,0 | 3,5       | ●          | ●  | ●  |     |     |
| 3,0      | 4,5        | 3         | 1,0 | 6,5       | ●          | ●  | ●  |     |     |
| 3,5      | 5,0        | 3         | 1,0 | 8,0       | ●          | ●  | ●  |     |     |
| 4,0      | 5,5        | 4         | 1,5 | 8,0       | ●          | ●  | ●  | ●   |     |
| 4,5      | 6,0        | 4         | 1,5 | 8,0       | ●          | ●  | ●  | ●   |     |
| 5,0      | 7,0        | 4         | 1,5 | 10,0      | ●          | ●  | ●  | ●   | ●   |
| 5,5      | 8,0        | 4         | 1,5 | 10,0      | ●          | ●  | ●  | ●   | ●   |
| 6,0      | 9,0        | 4         | 1,5 | 10,0      | ●          | ●  | ●  | ●   | ●   |
| 6,5      | 10,0       | 4         | 1,5 | 12,0      | ●          | ●  | ●  | ●   | ●   |
| 7,0      | 10,0       | 4         | 1,5 | 12,0      | ●          | ●  | ●  | ●   | ●   |
| 7,5      | 11,0       | 4         | 1,5 | 12,0      | ●          | ●  | ●  | ●   | ●   |
| 8,0      | 11,0       | 4         | 1,5 | 12,0      | ●          | ●  | ●  | ●   | ●   |
| 8,5      | 13,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 9,0      | 13,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 9,5      | 14,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 10,0     | 14,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 10,5     | 15,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 11,0     | 15,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 11,5     | 16,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 12,0     | 16,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 12,5     | 17,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 13,0     | 17,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 13,5     | 18,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 14,0     | 18,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 14,5     | 19,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 15,0     | 19,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 15,5     | 20,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 16,0     | 20,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 16,5     | 21,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 17,0     | 21,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 17,5     | 22,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 18,0     | 22,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 18,5     | 23,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 19,0     | 23,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 19,5     | 25,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 20,0     | 25,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |
| 25,0     | 30,0       | 4         | 1,5 | 15,0      | ●          | ●  | ●  | ●   | ●   |

= bevorzugte Abmessungen / preferred dimensions

[SE]



# Schneidstempel Posaunenmundstück mit fed. Auswerferstift

## Punches trumpet head with spring ejector



SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 753

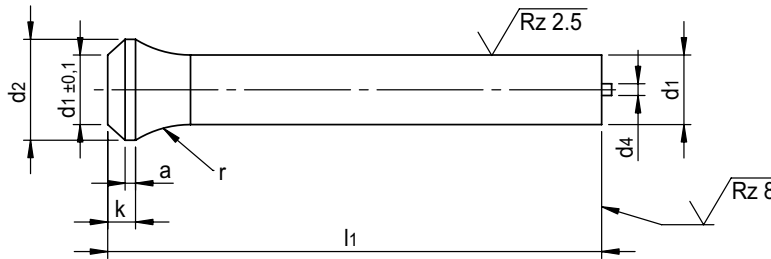
Mat.: HSS  
 Härte Schaft: 64 ±2 HRC  
 Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
 Hardness shank: 64 ±2 HRC  
 Head: 50 ±5 HRC

SE 753 / 13,0 x 100

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Punches with rotation prevention available, please specify when ordering.



| d1<br>h6 | d2<br>-0,2 | k<br>+0,2 | a   | r<br>-0,2 | d4  | l1<br>+0,5 |    |    |     |     |
|----------|------------|-----------|-----|-----------|-----|------------|----|----|-----|-----|
|          |            |           |     |           |     | 71         | 80 | 90 | 100 | 120 |
| 5,0      | 7          | 4         | 1,5 | 10        | 1,0 | ●          | ●  | ●  | ●   |     |
| 6,0      | 9          | 4         | 1,5 | 10        | 1,0 | ●          | ●  | ●  | ●   |     |
| 8,0      | 11         | 4         | 1,5 | 12        | 1,5 | ●          | ●  | ●  | ●   | ●   |
| 10,0     | 14         | 4         | 1,5 | 15        | 1,5 | ●          | ●  | ●  | ●   | ●   |
| 13,0     | 17         | 4         | 1,5 | 15        | 1,5 | ●          | ●  | ●  | ●   | ●   |
| 16,0     | 20         | 4         | 1,5 | 15        | 2,3 | ●          | ●  | ●  | ●   | ●   |
| 20,0     | 25         | 4         | 1,5 | 15        | 2,3 | ●          | ●  | ●  | ●   | ●   |
| 25,0     | 30         | 4         | 1,5 | 15        | 2,3 | ●          | ●  | ●  | ●   | ●   |

Zwischenabmessungen auf Anfrage! / Intermediate dimensions on request!

[SE]

# Schneidstempel Posaunenmundstück, abgesetzter Schaft

## Punches trumpet head, shouldered shank



SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 751

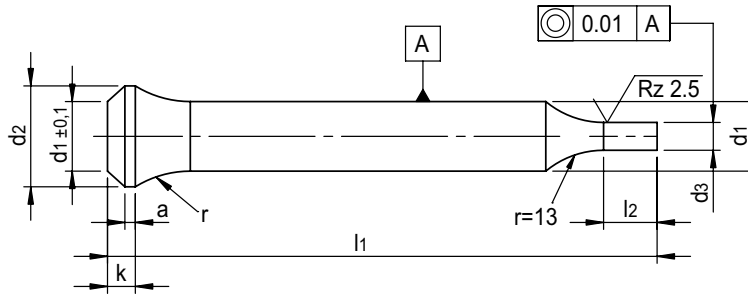
Mat.: HSS  
 Härte Schaft: 64 ±2 HRC  
 Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
 Hardness shank: 64 ±2 HRC  
 Head: 50 ±5 HRC

SE 751 /  
 10,0 x 100 / d3

Länge l2 frei wählbar!  
 Stempel mit Verdrehsicherung auf  
 Wunsch lieferbar (bei Bestellung  
 angeben).

Length l2 freely selectable!  
 Punches with rotation prevention  
 available, please specify when  
 ordering.



| d1<br>h6 | d3<br>h6<br>Stufung/step<br>0,01 | d2<br>-0,2 | k<br>+0,2 | a   | r<br>-0,2 | l2<br>+0,5 | l1<br>+0,5 |    |    |     |     |
|----------|----------------------------------|------------|-----------|-----|-----------|------------|------------|----|----|-----|-----|
|          |                                  |            |           |     |           |            | 71         | 80 | 90 | 100 | 120 |
| 2,0      | 0,5 - 1,9                        | 3,0        | 3         | 1,0 | 3,5       | 7          | ●          | ●  | ●  |     |     |
| 2,5      | 0,5 - 2,4                        | 3,5        | 3         | 1,0 | 3,5       | 7          | ●          | ●  | ●  |     |     |
| 3,0      | 1,6 - 2,9                        | 4,5        | 3         | 1,0 | 6,5       | 7          | ●          | ●  | ●  |     |     |
| 3,5      | 1,6 - 3,4                        | 5,0        | 3         | 1,0 | 8,0       | 10         | ●          | ●  | ●  |     |     |
| 4,0      | 1,6 - 3,9                        | 5,5        | 4         | 1,5 | 8,0       | 10         | ●          | ●  | ●  | ●   |     |
| 4,5      | 2,0 - 4,4                        | 6,0        | 4         | 1,5 | 8,0       | 10         | ●          | ●  | ●  | ●   |     |
| 5,0      | 2,5 - 4,9                        | 7,0        | 4         | 1,5 | 10,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 5,5      | 2,5 - 5,4                        | 8,0        | 4         | 1,5 | 10,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 6,0      | 3,0 - 5,9                        | 9,0        | 4         | 1,5 | 10,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 6,5      | 3,0 - 6,4                        | 10,0       | 4         | 1,5 | 12,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 7,0      | 3,5 - 6,9                        | 10,0       | 4         | 1,5 | 12,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 7,5      | 3,5 - 7,4                        | 11,0       | 4         | 1,5 | 12,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 8,0      | 3,5 - 7,9                        | 11,0       | 4         | 1,5 | 12,0      | 13         | ●          | ●  | ●  | ●   | ●   |
| 8,5      | 4,0 - 8,4                        | 13,0       | 4         | 1,5 | 15,0      | 13         | ●          | ●  | ●  | ●   | ●   |
| 9,0      | 4,0 - 8,9                        | 13,0       | 4         | 1,5 | 15,0      | 13         | ●          | ●  | ●  | ●   | ●   |
| 9,5      | 4,5 - 9,4                        | 14,0       | 4         | 1,5 | 15,0      | 13         | ●          | ●  | ●  | ●   | ●   |
| 10,0     | 5,0 - 9,9                        | 14,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 10,5     | 5,5 - 10,4                       | 15,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 11,0     | 5,5 - 10,9                       | 15,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 11,5     | 6,0 - 11,4                       | 16,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 12,0     | 6,0 - 11,9                       | 16,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 12,5     | 7,0 - 12,4                       | 17,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 13,0     | 9,0 - 12,9                       | 17,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 13,5     | 9,0 - 13,4                       | 18,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 14,0     | 9,5 - 13,9                       | 18,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 14,5     | 9,5 - 14,4                       | 19,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 15,0     | 10,0 - 14,9                      | 19,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 15,5     | 10,5 - 15,4                      | 20,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 16,0     | 12,0 - 15,9                      | 20,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 16,5     | 12,5 - 16,4                      | 21,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 17,0     | 13,0 - 16,9                      | 21,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 17,5     | 13,0 - 17,4                      | 22,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 18,0     | 13,5 - 17,9                      | 22,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 18,5     | 13,5 - 18,4                      | 23,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 19,0     | 14,0 - 18,9                      | 23,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 19,5     | 15,0 - 19,4                      | 25,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 20,0     | 16,0 - 19,9                      | 25,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 25,0     | 18,0 - 24,9                      | 30,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |

= bevorzugte Abmessungen / preferred dimensions





### SE 752 . .

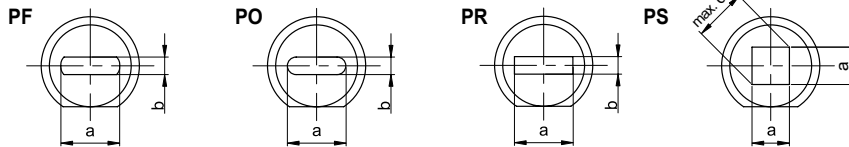
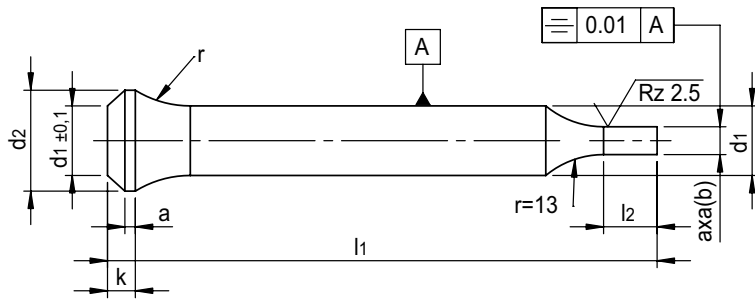
Mat.: HSS  
 Härte Schaft: 64 ±2 HRC  
 Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
 Hardness shank: 64 ±2 HRC  
 Head: 50 ±5 HRC

**SE 752 PF /**  
**10,0 x 100 / a x b**

Länge l2 frei wählbar!  
 Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Length l2 freely selectable!  
 Punches without rotation prevention available, please specify when ordering.



| d1<br>h6 | a x b<br>±0,01<br>Stufung/step<br>0,01 |   | d2<br>-0,2 | k<br>+0,2 | a   | r<br>-0,2 | l2<br>+0,5 | l1<br>+0,5 |    |    |     |     |
|----------|--|---|------------|-----------|-----|-----------|------------|------------|----|----|-----|-----|
|          | ≥                                      | ≤ |            |           |     |           |            | 71         | 80 | 90 | 100 | 120 |
| 2,0      | 0,5 - 1,9                              |   | 3,0        | 3         | 1,0 | 3,5       | 7          | ●          | ●  | ●  |     |     |
| 2,5      | 0,5 - 2,4                              |   | 3,5        | 3         | 1,0 | 3,5       | 7          | ●          | ●  | ●  |     |     |
| 3,0      | 1,6 - 2,9                              |   | 4,5        | 3         | 1,0 | 6,5       | 7          | ●          | ●  | ●  |     |     |
| 3,5      | 1,6 - 3,4                              |   | 5,0        | 3         | 1,0 | 8,0       | 10         | ●          | ●  | ●  |     |     |
| 4,0      | 1,6 - 3,9                              |   | 5,5        | 4         | 1,5 | 8,0       | 10         | ●          | ●  | ●  | ●   |     |
| 4,5      | 2,0 - 4,4                              |   | 6,0        | 4         | 1,5 | 8,0       | 10         | ●          | ●  | ●  | ●   |     |
| 5,0      | 2,5 - 4,9                              |   | 7,0        | 4         | 1,5 | 10,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 5,5      | 2,5 - 5,4                              |   | 8,0        | 4         | 1,5 | 10,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 6,0      | 3,0 - 5,9                              |   | 9,0        | 4         | 1,5 | 10,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 6,5      | 3,0 - 6,4                              |   | 10,0       | 4         | 1,5 | 12,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 7,0      | 3,5 - 6,9                              |   | 10,0       | 4         | 1,5 | 12,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 7,5      | 3,5 - 7,4                              |   | 11,0       | 4         | 1,5 | 12,0      | 10         | ●          | ●  | ●  | ●   | ●   |
| 8,0      | 3,5 - 7,9                              |   | 11,0       | 4         | 1,5 | 12,0      | 13         | ●          | ●  | ●  | ●   | ●   |
| 8,5      | 4,0 - 8,4                              |   | 13,0       | 4         | 1,5 | 15,0      | 13         | ●          | ●  | ●  | ●   | ●   |
| 9,0      | 4,0 - 8,9                              |   | 13,0       | 4         | 1,5 | 15,0      | 13         | ●          | ●  | ●  | ●   | ●   |
| 9,5      | 4,5 - 9,4                              |   | 14,0       | 4         | 1,5 | 15,0      | 13         | ●          | ●  | ●  | ●   | ●   |
| 10,0     | 5,0 - 9,9                              |   | 14,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 10,5     | 5,5 - 10,4                             |   | 15,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 11,0     | 5,5 - 10,9                             |   | 15,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 11,5     | 6,0 - 11,4                             |   | 16,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |

| d1<br>h6 | a x b<br>±0,01<br>Stufung/step<br>0,01 |   | d2<br>-0,2 | k<br>+0,2 | a   | r<br>-0,2 | l2<br>+0,5 | l1<br>+0,5 |    |    |     |     |
|----------|--|---|------------|-----------|-----|-----------|------------|------------|----|----|-----|-----|
|          | ≥                                      | ≤ |            |           |     |           |            | 71         | 80 | 90 | 100 | 120 |
| 12,0     | 6,0 - 11,9                             |   | 16,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 12,5     | 7,0 - 12,4                             |   | 17,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 13,0     | 9,0 - 12,9                             |   | 17,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 13,5     | 9,0 - 13,4                             |   | 18,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 14,0     | 9,5 - 13,9                             |   | 18,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 14,5     | 9,5 - 14,4                             |   | 19,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 15,0     | 10,0 - 14,9                            |   | 19,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 15,5     | 10,5 - 15,4                            |   | 20,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 16,0     | 12,0 - 15,9                            |   | 20,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 16,5     | 12,5 - 16,4                            |   | 21,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 17,0     | 13,0 - 16,9                            |   | 21,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 17,5     | 13,0 - 17,4                            |   | 22,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 18,0     | 13,5 - 17,9                            |   | 22,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 18,5     | 13,5 - 18,4                            |   | 23,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 19,0     | 14,0 - 18,9                            |   | 23,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 19,5     | 15,0 - 19,4                            |   | 25,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 20,0     | 16,0 - 19,9                            |   | 25,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |
| 25,0     | 18,0 - 24,9                            |   | 30,0       | 4         | 1,5 | 15,0      | 17         | ●          | ●  | ●  | ●   | ●   |

= bevorzugte Abmessungen / preferred dimensions





### SE 755 . . .

mit federndem Auswerferstift

with spring ejector

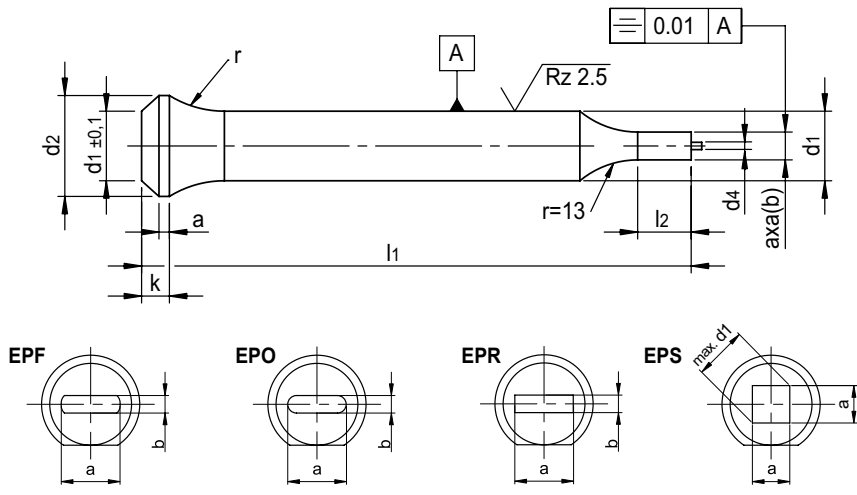
**SE 755 EPF /**  
**10,0 x 100 / a x b**

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

Länge l2 frei wählbar!  
Stempel ohne Verdrehsicherung auf  
Wunsch lieferbar (bei Bestellung  
angeben).

Length l2 freely selectable!  
Punches without rotation preventi-  
on available, please specify when  
ordering.



| d1<br>h6 | a x b<br>±0,01<br>Stufung/step<br>0,01<br>≥ ≤ | d2 | k<br>-0,2 | a<br>+0,2 | r  | l2<br>-0,2 | d4<br>+0,5 | l1<br>+0,5 |    |    |     |     |
|----------|---|----|-----------|-----------|----|------------|------------|------------|----|----|-----|-----|
|          |   |    |           |           |    |            |            | 71         | 80 | 90 | 100 | 120 |
| 5,0      | 2,5 - 4,9                                     | 7  | 4,0       | 1,5       | 10 | 10         | 1,0        | ●          | ●  | ●  | ●   |     |
| 6,0      | 3,0 - 5,9                                     | 9  | 4,0       | 1,5       | 10 | 10         | 1,0        | ●          | ●  | ●  | ●   |     |
| 8,0      | 4,0 - 7,9                                     | 11 | 4,0       | 1,5       | 12 | 13         | 1,5        | ●          | ●  | ●  | ●   | ●   |
| 10,0     | 5,0 - 9,9                                     | 14 | 4,0       | 1,5       | 15 | 17         | 1,5        | ●          | ●  | ●  | ●   | ●   |
| 13,0     | 9,0 - 12,9                                    | 17 | 4,0       | 1,5       | 15 | 17         | 1,5        | ●          | ●  | ●  | ●   | ●   |
| 16,0     | 12,0-15,9                                     | 20 | 4,0       | 1,5       | 15 | 17         | 2,3        | ●          | ●  | ●  | ●   | ●   |
| 20,0     | 16,0-19,9                                     | 25 | 4,0       | 1,5       | 15 | 17         | 2,3        | ●          | ●  | ●  | ●   | ●   |
| 25,0     | 18,0-24,9                                     | 30 | 4,0       | 1,5       | 15 | 17         | 2,3        | ●          | ●  | ●  | ●   | ●   |

Zwischenabmessungen auf Anfrage! / Intermediate dimensions on request!

[SE]

# Kopfsenker für Posaunenhal-Stampel

## Counterbore-tools for trumpet-head punches

SCHNEIDELEMENTE / CUTTING ELEMENTS

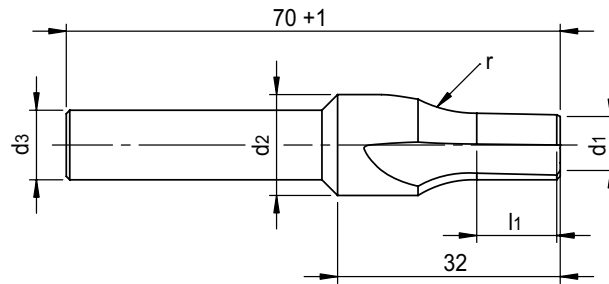


**SE 020**

Mat.: HSS  
Härte Schaft: 64 ±2 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC

SE 020 / 6,0



| d1<br>f7    | d2<br>h8 | d3<br>h11 | r  | l1 |
|-------------|----------|-----------|----|----|
| 5,0         | 7,4      | d2        | 10 | 10 |
| 5,5         | 8,5      | d2        | 10 | 10 |
| 6,0         | 9,5      | d2        | 10 | 10 |
| 6,5 / 7,0   | 10,5     | 10        | 12 | 12 |
| 7,5 / 8,0   | 11,5     | 10        | 12 | 12 |
| 8,5 / 9,0   | 13,5     | 10        | 15 | 12 |
| 9,5 / 10,0  | 14,5     | 10        | 15 | 12 |
| 10,5 / 11,0 | 15,5     | 10        | 15 | 15 |
| 11,5 / 12,0 | 16,5     | 10        | 15 | 15 |
| 12,5 / 13,0 | 17,5     | 10        | 15 | 15 |
| 13,5 / 14,0 | 18,5     | 10        | 15 | 15 |
| 14,5 / 15,0 | 19,5     | 10        | 15 | 15 |
| 15,5 / 16,0 | 20,5     | 10        | 15 | 15 |
| 16,5 / 17,0 | 21,5     | 16        | 15 | 15 |
| 17,5 / 18,0 | 22,5     | 16        | 15 | 15 |
| 18,5 / 19,0 | 23,5     | 16        | 15 | 15 |
| 19,5 / 20,0 | 25,5     | 16        | 15 | 15 |
| 25,0        | 30,5     | 16        | 15 | 15 |

Zwischenabmessungen auf Anfrage! / Intermediate dimensions on request!

[SE]



## SE 709

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

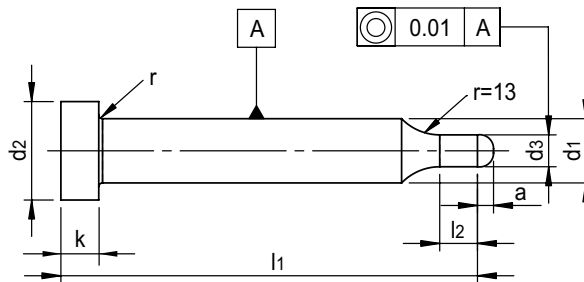
**SE 709 /**  
**6 x 100 / d3**

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

**Gesamtlänge = l1 + a**  
**Länge l2 frei wählbar!**  
Fehlende Maße siehe **SE 712** (Seite SE.4)

**Total length = l1 + a**  
**Length l2 freely selectable!**  
for missing dimensions please see **SE 712** (Page SE.4)

Punches with rotation prevention available, please specify when ordering.



[SE]

| d1<br>m5 | d3<br>+0,01<br>Stufung/step<br>0,01 | l2 | a    | l1 |    |                    |    |     |
|----------|-------------------------------------|----|------|----|----|--------------------|----|-----|
|          |                                     |    |      | 63 | 71 | 80<br>+0,5<br>+0,2 | 90 | 100 |
| 5        | 0,8 - 2,0                           | 10 | 3,0  | ●  | ●  | ●                  | ●  | ●   |
| 6        | 2,1 - 4,5                           | 10 | 4,5  | ●  | ●  | ●                  | ●  | ●   |
| 8        | 4,6 - 7,5                           | 13 | 6,5  | ●  | ●  | ●                  | ●  | ●   |
| 10       | 7,6 - 10,0                          | 17 | 8,0  | ●  | ●  | ●                  | ●  | ●   |
| 13       | 10,1 - 13,0                         | 17 | 9,5  | ●  | ●  | ●                  | ●  | ●   |
| 16       | 13,1 - 16,0                         | 17 | 11,5 | ●  | ●  | ●                  | ●  | ●   |
| 20       | 16,1 - 20,0                         | 17 | 13,5 | ●  | ●  | ●                  | ●  | ●   |
| 25       | 20,1 - 25,0                         | 17 | 13,5 | ●  | ●  | ●                  | ●  | ●   |



# Schneidstempel 30° Kopf

## Punches 30° head

SCHNEIDELEMENTE / CUTTING ELEMENTS



### SE 730

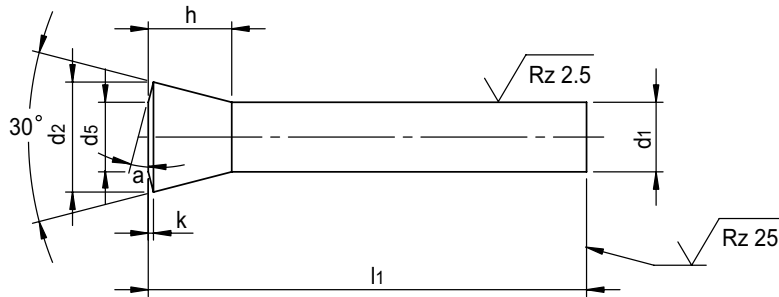
Mat.: HSS  
 Härte Schaft: 64 ±2 HRC  
 Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
 Hardness shank: 64 ±2 HRC  
 Head: 50 ±5 HRC

SE 730 / 8 x 100

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Punches with rotation prevention available, please specify when ordering.



| d1<br>h6 | d2<br>-0,3 | d5   | h  | k   | a    | l1<br>+1 |    |    |     |     |
|----------|------------|------|----|-----|------|----------|----|----|-----|-----|
|          |            |      |    |     |      | 71       | 80 | 90 | 100 | 120 |
| 4        | 6,6        | 3,8  | 6  | 1,0 | 35,0 | ●        | ●  | ●  | ●   |     |
| 5        | 8,2        | 5,0  | 7  | 1,0 | 32,0 | ●        | ●  | ●  | ●   | ●   |
| 6        | 9,7        | 6,0  | 8  | 1,0 | 28,0 | ●        | ●  | ●  | ●   | ●   |
| 7        | 11,8       | 7,0  | 10 | 1,0 | 22,6 | ●        | ●  | ●  | ●   | ●   |
| 8        | 12,8       | 8,0  | 10 | 1,0 | 22,5 | ●        | ●  | ●  | ●   | ●   |
| 9        | 14,4       | 9,0  | 11 | 1,0 | 20,0 | ●        | ●  | ●  | ●   | ●   |
| 10       | 15,9       | 10,0 | 12 | 1,0 | 19,0 | ●        | ●  | ●  | ●   | ●   |
| 11       | 17,4       | 11,0 | 13 | 1,5 | 25,0 | ●        | ●  | ●  | ●   | ●   |
| 12       | 18,7       | 12,0 | 14 | 1,5 | 24,0 | ●        | ●  | ●  | ●   | ●   |
| 13       | 20,2       | 13,0 | 15 | 1,5 | 26,0 | ●        | ●  | ●  | ●   | ●   |
| 14       | 21,8       | 14,0 | 16 | 1,5 | 21,0 | ●        | ●  | ●  | ●   | ●   |
| 15       | 23,3       | 15,0 | 17 | 1,5 | 20,0 | ●        | ●  | ●  | ●   | ●   |
| 16       | 24,6       | 16,0 | 18 | 2,0 | 25,0 | ●        | ●  | ●  | ●   | ●   |

[SE]



### SE 734

mit federndem Auswerferstift

with spring ejector

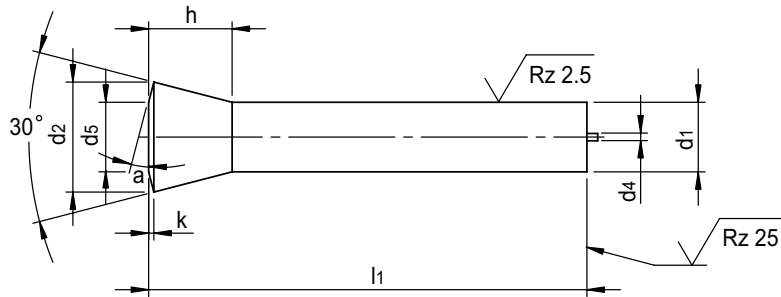
SE 734 / 8 x 100

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Punches with rotation prevention available, please specify when ordering.



| d1<br>h6 | d2<br>-0,3 | d4  | d5   | h  | k   | a    | l1<br>+1 |    |    |     |     |
|----------|------------|-----|------|----|-----|------|----------|----|----|-----|-----|
|          |            |     |      |    |     |      | 71       | 80 | 90 | 100 | 120 |
| 5        | 8,2        | 1   | 5,0  | 7  | 1,0 | 32,0 | ●        | ●  | ●  | ●   | ●   |
| 6        | 9,7        | 1   | 6,0  | 8  | 1,0 | 28,0 | ●        | ●  | ●  | ●   | ●   |
| 7        | 11,8       | 1   | 7,0  | 10 | 1,0 | 22,6 | ●        | ●  | ●  | ●   | ●   |
| 8        | 12,8       | 1,5 | 8,0  | 10 | 1,0 | 22,5 | ●        | ●  | ●  | ●   | ●   |
| 9        | 14,4       | 1,5 | 9,0  | 11 | 1,0 | 20,0 | ●        | ●  | ●  | ●   | ●   |
| 10       | 15,9       | 1,5 | 10,0 | 12 | 1,0 | 19,0 | ●        | ●  | ●  | ●   | ●   |
| 11       | 17,4       | 1,5 | 11,0 | 13 | 1,5 | 25,0 | ●        | ●  | ●  | ●   | ●   |
| 12       | 18,7       | 1,5 | 12,0 | 14 | 1,5 | 24,0 | ●        | ●  | ●  | ●   | ●   |
| 13       | 20,2       | 1,5 | 13,0 | 15 | 1,5 | 26,0 | ●        | ●  | ●  | ●   | ●   |
| 14       | 21,8       | 1,5 | 14,0 | 16 | 1,5 | 21,0 | ●        | ●  | ●  | ●   | ●   |
| 15       | 23,3       | 2,3 | 15,0 | 17 | 1,5 | 20,0 | ●        | ●  | ●  | ●   | ●   |
| 16       | 24,6       | 2,3 | 16,0 | 18 | 2,0 | 25,0 | ●        | ●  | ●  | ●   | ●   |



# Schneidstempel 30° Kopf, abgesetzter Schaft

## Punches 30° head, shouldered shank



SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 732

Mat.: HSS  
 Härte Schaft: 64 ±2 HRC  
 Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
 Hardness shank: 64 ±2 HRC  
 Head: 50 ±5 HRC

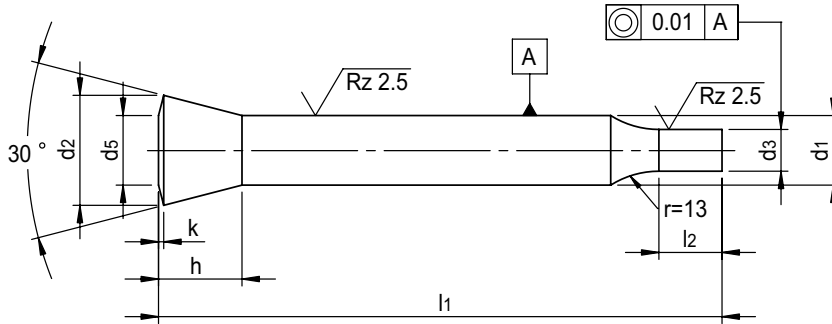
SE 732 /  
 6 x 100 / d3

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Länge l2 frei wählbar!  
 Fehlende Maße siehe SE 730 (Seite SE.23)

Length l2 freely selectable!  
 for missing dimensions please see SE 730 (page SE.23)

Punches with rotation prevention available, please specify when ordering.



| d1<br>h6 | d3<br>h6<br>Stufung/step<br>0,01 | l2 | d5   | h  | k   | l1<br>+1 |    |    |     |     |
|----------|----------------------------------|----|------|----|-----|----------|----|----|-----|-----|
|          |                                  |    |      |    |     | 71       | 80 | 90 | 100 | 120 |
| 4        | 1,6 - 3,9                        | 10 | 3,8  | 6  | 1,0 | ●        | ●  | ●  | ●   |     |
| 5        | 2,5 - 4,9                        | 10 | 5,0  | 7  | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 6        | 3,0 - 5,9                        | 10 | 6,0  | 8  | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 7        | 3,0 - 6,9                        | 10 | 7,0  | 10 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 8        | 4,0 - 7,9                        | 13 | 8,0  | 10 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 9        | 4,5 - 8,9                        | 13 | 9,0  | 11 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 10       | 5,0 - 9,9                        | 17 | 10,0 | 12 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 11       | 5,0 - 10,9                       | 17 | 11,0 | 13 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 12       | 6,0 - 11,9                       | 17 | 12,0 | 14 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 13       | 9,0 - 12,9                       | 17 | 13,0 | 15 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 14       | 9,5 - 13,9                       | 17 | 14,0 | 16 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 15       | 10,0 - 14,9                      | 17 | 15,0 | 17 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 16       | 12,0 - 15,9                      | 17 | 16,0 | 18 | 2,0 | ●        | ●  | ●  | ●   | ●   |



# Schneidstempel 30° Kopf, abgesetzter Schaft

## Punches 30° head, shouldered shank



SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 735

mit federndem Auswerferstift

with spring ejector

SE 735 /  
6 x 100 / d3

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 50 ±5 HRC

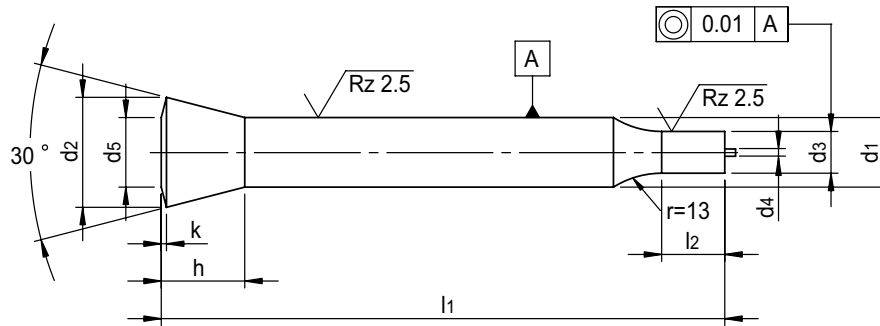
Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 50 ±5 HRC

Stempel mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Länge l2 frei wählbar!  
Fehlende Maße siehe SE 730 (Seite SE.23)

Length l2 freely selectable!  
for missing dimensions please see SE 730 (page SE.23)

Punches with rotation prevention available, please specify when ordering.



| d1<br>h6 | d3<br>h6<br>Stufung/step<br>0,01 | d4  | l2 | d5   | h  | k   | l1<br>+1 |    |    |     |     |
|----------|----------------------------------|-----|----|------|----|-----|----------|----|----|-----|-----|
|          |                                  |     |    |      |    |     | 71       | 80 | 90 | 100 | 120 |
| 5        | 2,5 - 4,9                        | 1   | 10 | 5,0  | 7  | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 6        | 3,0 - 5,9                        | 1   | 10 | 6,0  | 8  | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 7        | 3,0 - 6,9                        | 1   | 10 | 7,0  | 10 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 8        | 4,0 - 7,9                        | 1,5 | 13 | 8,0  | 10 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 9        | 4,5 - 8,9                        | 1,5 | 13 | 9,0  | 11 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 10       | 5,0 - 9,9                        | 1,5 | 17 | 10,0 | 12 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 11       | 5,0 - 10,9                       | 1,5 | 17 | 11,0 | 13 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 12       | 6,0 - 11,9                       | 1,5 | 17 | 12,0 | 14 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 13       | 9,0 - 12,9                       | 1,5 | 17 | 13,0 | 15 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 14       | 9,5 - 13,9                       | 1,5 | 17 | 14,0 | 16 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 15       | 10,0 - 14,9                      | 2,3 | 17 | 15,0 | 17 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 16       | 12,0 - 15,9                      | 2,3 | 17 | 16,0 | 18 | 2,0 | ●        | ●  | ●  | ●   | ●   |

[SE]



# Schneidstempel 30° Kopf, abgesetzter Schaft

## Punches 30° head, shouldered shank



SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 733 . . .

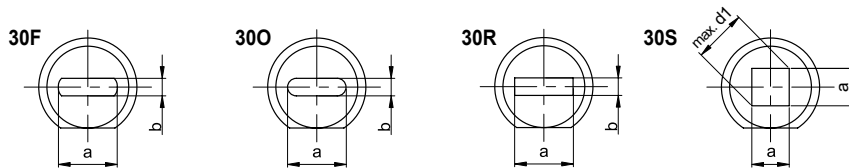
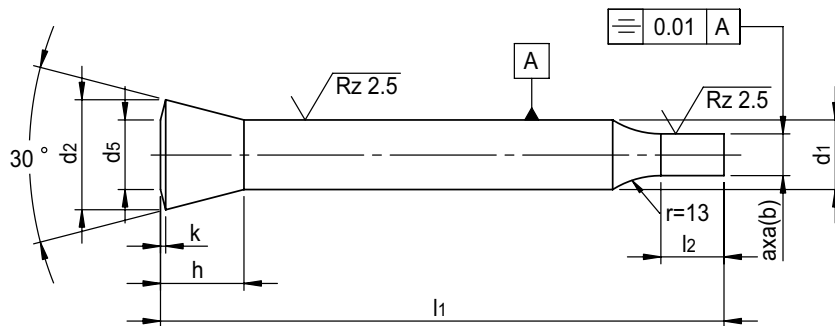
Mat.: HSS  
 Härte Schaft: 64 ±2 HRC  
 Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
 Hardness shank: 64 ±2 HRC  
 Head: 50 ±5 HRC

SE 733 30F /  
 6 x 100 / a x b

Länge l2 frei wählbar!  
 Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).  
 Fehlende Maße siehe SE 730 (Seite SE.23)

Length l2 freely selectable!  
 Punches without rotation prevention available, please specify when ordering.  
 for missing dimensions please see SE 730 (page SE.23)



| d1<br>h6 | a x b<br>±0,01<br>Stufung/step<br>0,01<br>≥ ≤ | l2<br>+0,5 | d5   | h  | k   | l1<br>+1 |    |    |     |     |
|----------|---|------------|------|----|-----|----------|----|----|-----|-----|
|          |   |            |      |    |     | 71       | 80 | 90 | 100 | 120 |
| 4        | 1,6 - 3,9                                     | 10         | 3,8  | 6  | 1,0 | ●        | ●  | ●  | ●   |     |
| 5        | 2,5 - 4,9                                     | 10         | 5,0  | 7  | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 6        | 3,0 - 5,9                                     | 10         | 6,0  | 8  | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 7        | 3,0 - 6,9                                     | 10         | 7,0  | 10 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 8        | 4,0 - 7,9                                     | 13         | 8,0  | 10 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 9        | 4,5 - 8,9                                     | 13         | 9,0  | 11 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 10       | 5,0 - 9,9                                     | 17         | 10,0 | 12 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 11       | 5,0 - 10,9                                    | 17         | 11,0 | 13 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 12       | 6,0 - 11,9                                    | 17         | 12,0 | 14 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 13       | 9,0 - 12,9                                    | 17         | 13,0 | 15 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 14       | 9,5 - 13,9                                    | 17         | 14,0 | 16 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 15       | 10,0 - 14,9                                   | 17         | 15,0 | 17 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 16       | 12,0 - 15,9                                   | 17         | 16,0 | 18 | 2,0 | ●        | ●  | ●  | ●   | ●   |





# Schneidstempel 30° Kopf, abgesetzter Schaft

## Punches 30° head, shouldered shank



SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 736 . . .

mit federndem Auswerferstift

with spring ejector

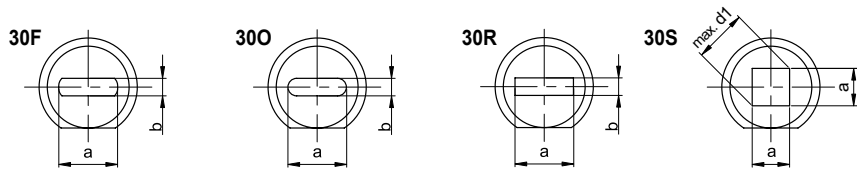
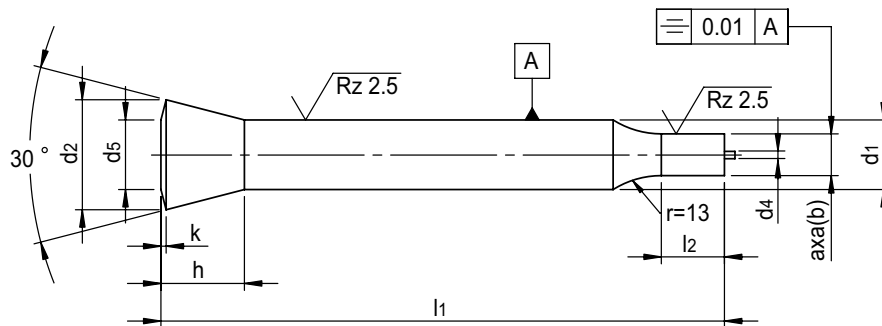
**SE 736 30F / 6 x 100 / a x b**

Mat.: HSS  
 Härte Schaft: 64 ±2 HRC  
 Kopf: 50 ±5 HRC

Mat.: HSS (e.g. M2)  
 Hardness shank: 64 ±2 HRC  
 Head: 50 ±5 HRC

**Länge l2 frei wählbar!**  
**Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).**  
 Fehlende Maße siehe **SE 730** (Seite SE.23)

**Length l2 freely selectable!**  
**Punches without rotation prevention available, please specify when ordering.**  
 for missing dimensions please see **SE 730** (page SE.23)

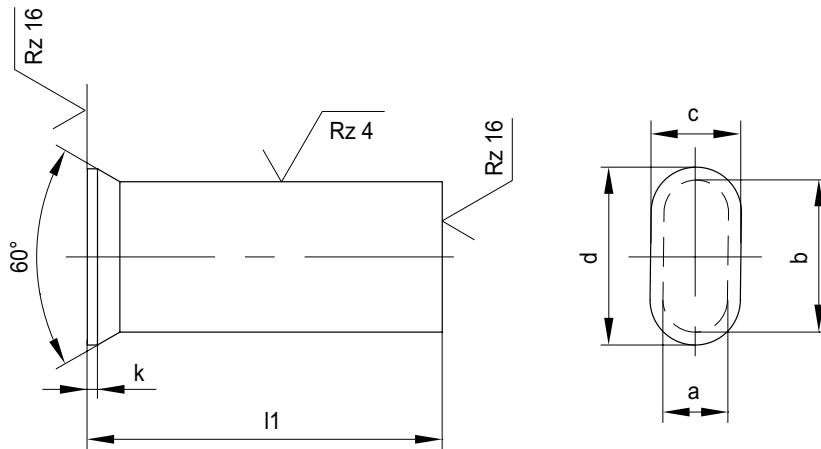


| d1<br>h6 | a x b<br>±0,01<br>Stufung/step<br>0,01<br>≥ ≤ | d4  | l2<br>+0,5 | d5   | h  | k   | l1<br>+1 |    |    |     |     |
|----------|---|-----|------------|------|----|-----|----------|----|----|-----|-----|
|          |   |     |            |      |    |     | 71       | 80 | 90 | 100 | 120 |
| 5        | 2,5 - 4,9                                     | 1   | 10         | 5,0  | 7  | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 6        | 3,0 - 5,9                                     | 1   | 10         | 6,0  | 8  | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 7        | 3,0 - 6,9                                     | 1   | 10         | 7,0  | 10 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 8        | 4,0 - 7,9                                     | 1,5 | 13         | 8,0  | 10 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 9        | 4,5 - 8,9                                     | 1,5 | 13         | 9,0  | 11 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 10       | 5,0 - 9,9                                     | 1,5 | 17         | 10,0 | 12 | 1,0 | ●        | ●  | ●  | ●   | ●   |
| 11       | 5,0 - 10,9                                    | 1,5 | 17         | 11,0 | 13 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 12       | 6,0 - 11,9                                    | 1,5 | 17         | 12,0 | 14 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 13       | 9,0 - 12,9                                    | 1,5 | 17         | 13,0 | 15 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 14       | 9,5 - 13,9                                    | 1,5 | 17         | 14,0 | 16 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 15       | 10,0 - 14,9                                   | 2,3 | 17         | 15,0 | 17 | 1,5 | ●        | ●  | ●  | ●   | ●   |
| 16       | 12,0 - 15,9                                   | 2,3 | 17         | 16,0 | 18 | 2,0 | ●        | ●  | ●  | ●   | ●   |

[SE]

mit Senkkopf

with countersunk head



SE 744

**Qualitätsausführung**  
Kopf und Schaft feinstgeschliffen  
Kopf gestaucht

**Grade A - finish**  
Head and shank finish-ground  
Jolted head

SE 744 / a x b x l1 x  
c x d x k

Mat.: HWS  
Härte Schaft: 62 ±2 HRC  
Kopf: 45 ±5 HRC

Mat.: HWS (e.g. A2)  
Hardness shank: 62 ±2 HRC  
Head: 45 ±5 HRC

ohne Toleranzangabe  
a/b: ±0,02  
l: +0,5 / +1,0

untoleranced  
a/b: ±0,02  
l: +0,5 / +1,0

**Kopfmaße können nach Ihren  
Angaben gefertigt werden!**

**Head-dimensions can be produced  
as per customers request!**



SE 745

**Qualitätsausführung**  
Kopf und Schaft feinstgeschliffen  
Kopf gestaucht

**Grade A - finish**  
Head and shank finish-ground  
Jolted head

SE 745 / a x b x l1 x  
c x d x k

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 45 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 45 ±5 HRC

ohne Toleranzangabe  
a/b: ±0,02  
l: +0,5 / +1,0

untoleranced  
a/b: ±0,02  
l: +0,5 / +1,0

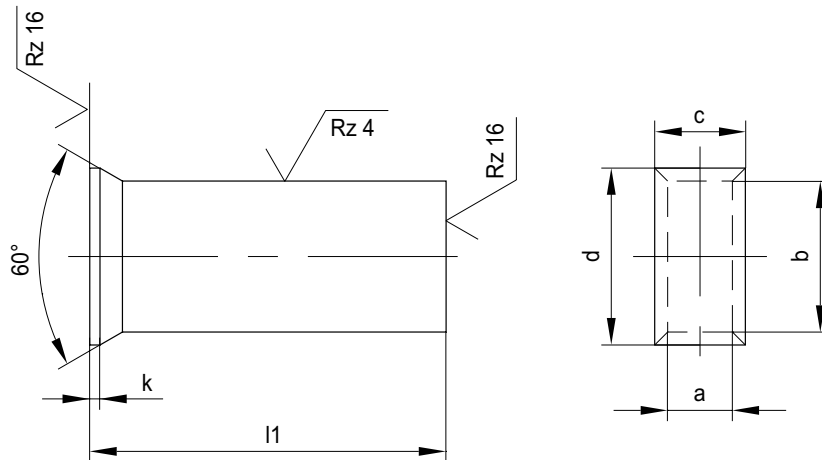
**Kopfmaße können nach Ihren  
Angaben gefertigt werden!**

**Head-dimensions can be produced  
as per customers request!**



mit Senkkopf

with countersunk head



**SE 748**

**Qualitätsausführung**  
Kopf und Schaft feinstgeschliffen  
Kopf gestaut

**Grade A - finish**  
Head and shank finish-ground  
Jolted head

**SE 748 / a x b x l1 x c x d x k**

Mat.: HWS  
Härte Schaft: 62 ±2 HRC  
Kopf: 45 ±5 HRC

HWS (e.g. A2)  
Hardness shank: 62 ±2 HRC  
Head: 45 ±5 HRC

ohne Toleranzangabe  
a/b: ±0,02  
l: +0,5 / +1,0

untoleranced  
a/b: ±0,02  
l: +0,5 / +1,0

**Kopfmaße können nach Ihren Angaben gefertigt werden!**

**Head-dimensions can be produced as per customers request!**



**SE 749**

**Qualitätsausführung**  
Kopf und Schaft feinstgeschliffen  
Kopf gestaut

**Grade A - finish**  
Head and shank finish-ground  
Jolted head

**SE 749 / a x b x l1 x c x d x k**

Mat.: HSS  
Härte Schaft: 64 ±2 HRC  
Kopf: 45 ±5 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC  
Head: 45 ±5 HRC

ohne Toleranzangabe  
a/b: ±0,02  
l: +0,5 / +1,0

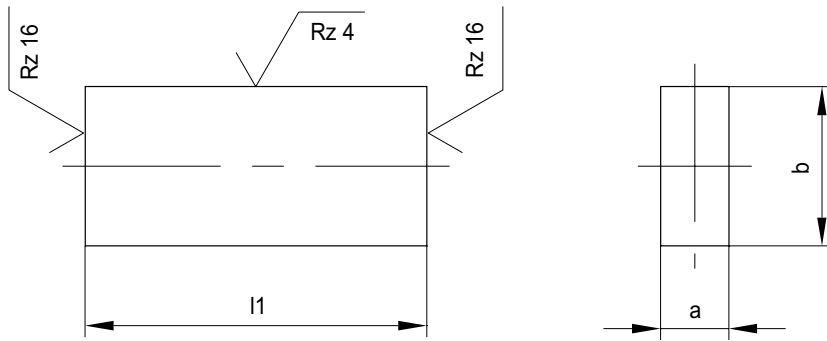
untoleranced  
a/b: ±0,02  
l: +0,5 / +1,0

**Kopfmaße können nach Ihren Angaben gefertigt werden!**

**Head-dimensions can be produced as per customers request!**




[SE]



**SE 738**

Mat.: HWS  
Härte Schaft: 62 ±2 HRC

Mat.: HWS (e.g. A2)  
Hardness shank: 62 ±2 HRC

 SE 738 / a x b x l1

ohne Toleranzangabe  
a/b: ±0,02  
l: +0,5 / +1,0


untoleranced  
a/b: ±0,02  
l: +0,5 / +1,0



**SE 739**

Mat.: HSS  
Härte Schaft: 64 ±2 HRC

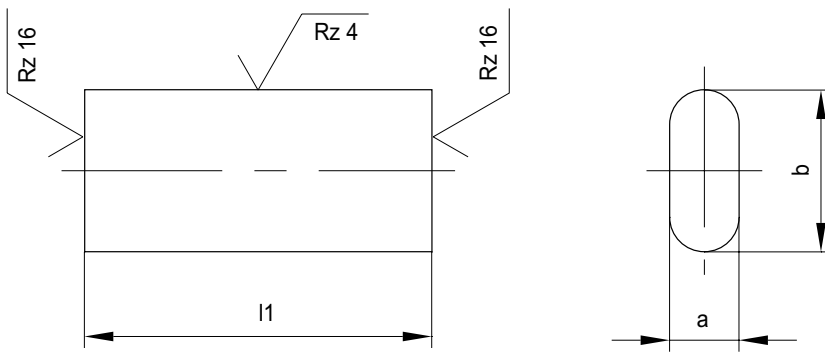
Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC

 SE 739 / a x b x l1

ohne Toleranzangabe  
a/b: ±0,02  
l: +0,5 / +1,0

untoleranced  
a/b: ±0,02  
l: +0,5 / +1,0





**SE 740**

Mat.: HWS  
Härte Schaft: 62 ±2 HRC

Mat.: HWS (e.g. A2)  
Hardness shank: 62 ±2 HRC

 **SE 740 / a x b x l1**

ohne Toleranzangabe  
a/b: ±0,02  
l: +0,5 / +1,0

untoleranced  
a/b: ±0,02  
l: +0,5 / +1,0



**SE 741**

Mat.: HSS  
Härte Schaft: 64 ±2 HRC

Mat.: HSS (e.g. M2)  
Hardness shank: 64 ±2 HRC

 **SE 741 / a x b x l1**

ohne Toleranzangabe  
a/b: ±0,02  
l: +0,5 / +1,0

untoleranced  
a/b: ±0,02  
l: +0,5 / +1,0



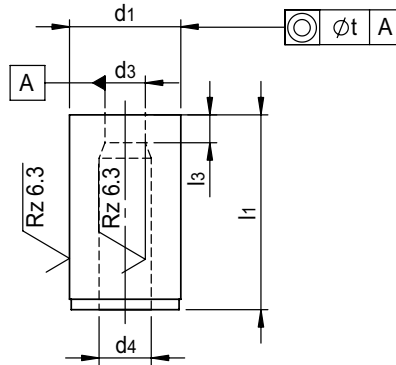
[SE]

SE 791

Mat.: HSS  
Härte: 64 ±2 HRC

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

SE 791 / 3,0 x 28



| d3<br>H8    | Stufung<br>Graduation | d1<br>n6 | d4          | kurze Ausführung<br>short version |    | lange Ausführung<br>long version |    | t    |
|-------------|-----------------------|----------|-------------|-----------------------------------|----|----------------------------------|----|------|
|             |                       |          |             | l1<br>+0,5                        | l3 | l1<br>+0,5                       | l3 |      |
| 1,0         | 0,1                   | 5        | $d_3 + 0,3$ | 20                                | 2  | -                                | -  | 0,01 |
| 1,1 - 2,0   | 0,1                   | 6        | $d_3 + 0,3$ | 20                                | 3  | 28                               | 3  | 0,01 |
| 2,1 - 3,0   | 0,1                   | 7        | $d_3 + 0,5$ | 20                                | 3  | 28                               | 3  | 0,01 |
| 3,1 - 4,0   | 0,1                   | 8        | $d_3 + 0,5$ | 20                                | 3  | 28                               | 3  | 0,01 |
| 4,1 - 5,0   | 0,1                   | 10       | $d_3 + 0,7$ | 20                                | 4  | 28                               | 4  | 0,01 |
| 5,1 - 6,0   | 0,1                   | 12       | $d_3 + 0,7$ | 20                                | 4  | 28                               | 4  | 0,02 |
| 6,1 - 8,0   | 0,1                   | 15       | $d_3 + 0,7$ | 20                                | 4  | 28                               | 4  | 0,02 |
| 8,1 - 10,0  | 0,1                   | 18       | $d_3 + 1,0$ | 20                                | 4  | 28                               | 4  | 0,02 |
| 10,1 - 12,0 | 0,1                   | 22       | $d_3 + 1,0$ | 20                                | 5  | 28                               | 5  | 0,02 |
| 12,1 - 15,0 | 0,1                   | 26       | $d_3 + 1,0$ | 20                                | 5  | 28                               | 5  | 0,02 |
| 15,5 - 18,0 | 0,5                   | 30       | $d_3 + 1,0$ | -                                 | -  | 28                               | 5  | 0,02 |

[SE]

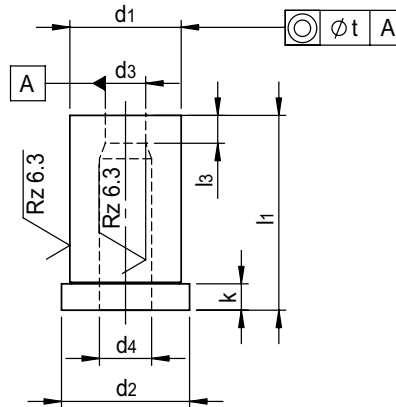


### SE 792

Mat.: HSS  
Härte: 64 ±2 HRC

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

SE 792 / 3,0 x 28



[SE]

| d3<br>H8    | Stufung<br>Graduation | d1<br>k6 | d2 | d4       | kurze Ausführung<br>short version |    |   | lange Ausführung<br>long version |    |   | t    |
|-------------|-----------------------|----------|----|----------|-----------------------------------|----|---|----------------------------------|----|---|------|
|             |                       |          |    |          | l1<br>+0,5                        | l3 | k | l1<br>+0,5                       | l3 | k |      |
| 1,0         | 0,1                   | 5        | 7  | d3 + 0,3 | 20                                | 2  | 4 | –                                | –  | – | 0,01 |
| 1,1 - 2,0   | 0,1                   | 6        | 8  | d3 + 0,3 | 20                                | 3  | 4 | 28                               | 3  | 4 | 0,01 |
| 2,1 - 3,0   | 0,1                   | 7        | 9  | d3 + 0,5 | 20                                | 3  | 4 | 28                               | 3  | 4 | 0,01 |
| 3,1 - 4,0   | 0,1                   | 8        | 10 | d3 + 0,5 | 20                                | 3  | 4 | 28                               | 3  | 4 | 0,01 |
| 4,1 - 5,0   | 0,1                   | 10       | 12 | d3 + 0,7 | 20                                | 4  | 4 | 28                               | 4  | 4 | 0,01 |
| 5,1 - 6,0   | 0,1                   | 12       | 14 | d3 + 0,7 | 20                                | 4  | 4 | 28                               | 4  | 4 | 0,02 |
| 6,1 - 8,0   | 0,1                   | 15       | 17 | d3 + 0,7 | 20                                | 4  | 4 | 28                               | 4  | 4 | 0,02 |
| 8,1 - 10,0  | 0,1                   | 18       | 20 | d3 + 1,0 | 20                                | 4  | 4 | 28                               | 4  | 4 | 0,02 |
| 10,1 - 12,0 | 0,1                   | 22       | 24 | d3 + 1,0 | 20                                | 5  | 4 | 28                               | 5  | 4 | 0,02 |
| 12,1 - 15,0 | 0,1                   | 26       | 28 | d3 + 1,0 | 20                                | 5  | 4 | 28                               | 5  | 4 | 0,02 |
| 15,5 - 18,0 | 0,5                   | 30       | 32 | d3 + 1,0 | –                                 | –  | – | 28                               | 5  | 4 | 0,02 |



SE 711 ED

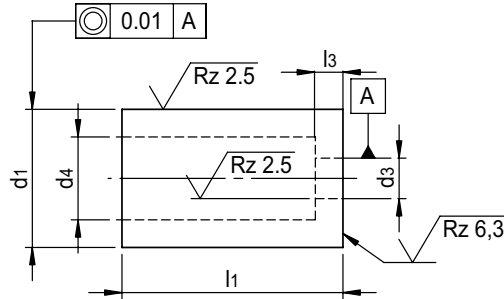
Mat.: HSS  
Härte: 64 ±2 HRC

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

SE 711 ED /  
20 x 25 / d3

Buchsen mit Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Bushings with rotation prevention available, please specify when ordering.



| d1<br>m5 | l3  | d3<br>+0,02<br>Stufung/step<br>0,01 | d4   | l1<br>+0,5 |    |    |    |    |    |    |    |    |   |
|----------|---|-------------------------------------|------|------------|----|----|----|----|----|----|----|----|---|
|          |   |                                     |      | 16         | 19 | 20 | 22 | 25 | 28 | 30 | 32 | 35 |   |
| 5        | 2   | 1,0-2,4                             | 2,8  | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 6        | 3   | 1,6-3,0                             | 3,5  | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 8        | 4   | 2,0-3,5                             | 4,0  | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 10       | 4   | 2,5-5,0                             | 5,8  | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 13       | 5   | 3,0-7,0                             | 8,0  |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 16       | 5   | 4,0-9,0                             | 9,5  |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 19*      | 4   | 5,0-10,0                            | 11,0 |            | ●  |    |    | ●  |    | ●  | ●  |    |   |
| 20       | 8   | 6,0-11,0                            | 12,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 22       | 8   | 8,0-11,0                            | 15,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 25       | 8   | 8,0-16,0                            | 17,3 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 32       | 8   | 8,0-20,0                            | 20,7 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 38*      | 6   | 16,0-26,0                           | 28,0 |            |    |    |    |    |    | ●  | ●  |    |   |
| 40       | 8   | 19,0-27,0                           | 27,7 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 50       | 8   | 26,0-36,0                           | 37,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ● |
| 55*      | 8   | 35,0-41,0                           | 42,0 |            |    |    |    |    |    | ●  | ●  |    |   |
| *        | = nicht nach ISO 8977A / not in acc. with ISO 8977A |                                     |      |            |    |    |    |    |    |    |    |    |   |

[SE]





SE 713 EKD

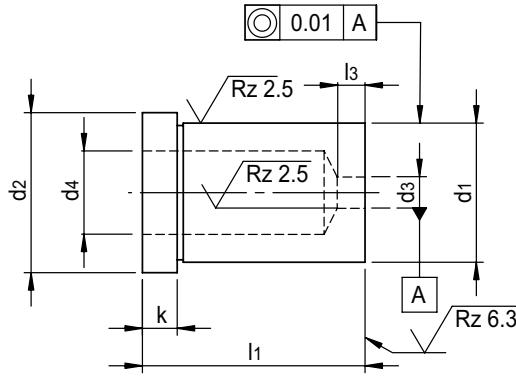
Mat.: HSS  
Härte: 64 ±2 HRC

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

SE 713 EKD /  
20 x 25 / d3

Buchsen mit Verdrehssicherung auf Wunsch lieferbar (bei Bestellung angeben).

Bushings with rotation prevention available, please specify when ordering.



[SE]

| d1<br>m5 | d2<br>+0,3 | l3 | k | d3<br>+0,02<br>Stufung/step<br>0,01 | d4   | l1<br>+0,5 |    |    |    |    |    |    |    |
|----------|------------|----|---|-------------------------------------|------|------------|----|----|----|----|----|----|----|
|          |            |    |   |                                     |      | 16         | 20 | 22 | 25 | 28 | 30 | 32 | 35 |
| 5        | 8          | 2  | 5 | 1,0 - 2,4                           | 2,8  | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 6        | 9          | 3  | 5 | 1,6 - 3,0                           | 3,5  | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 8        | 11         | 4  | 5 | 2,0 - 3,5                           | 4,0  | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 10       | 13         | 4  | 5 | 2,5 - 5,0                           | 5,8  | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 13       | 16         | 5  | 5 | 3,0 - 7,0                           | 8,0  |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 16       | 19         | 5  | 5 | 4,0 - 9,0                           | 9,5  |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 19*      | 22         | 4  | 5 | 5,0 - 10,0                          | 11,0 |            |    |    | ●  | ●  | ●  | ●  | ●  |
| 20       | 23         | 8  | 5 | 6,0 - 11,0                          | 12,0 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 22       | 25         | 8  | 5 | 8,0 - 14,0                          | 15,0 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 25       | 28         | 8  | 5 | 8,0 - 16,0                          | 17,3 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 32       | 35         | 8  | 5 | 8,0 - 20,0                          | 20,7 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 38*      | 42         | 6  | 5 | 16,0 - 26,0                         | 28,0 |            |    |    |    | ●  |    | ●  | ●  |
| 40       | 43         | 8  | 5 | 19,0 - 27,0                         | 27,7 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 50       | 53         | 8  | 5 | 26,0 - 36,0                         | 37,0 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 55*      | 58         | 8  | 5 | 35,0 - 41,0                         | 42,0 |            |    |    |    |    |    |    | ●  |

\* = nicht nach ISO 8977B / not in acc. with ISO 8977B



SE 715 . . .

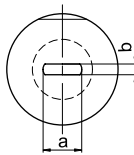
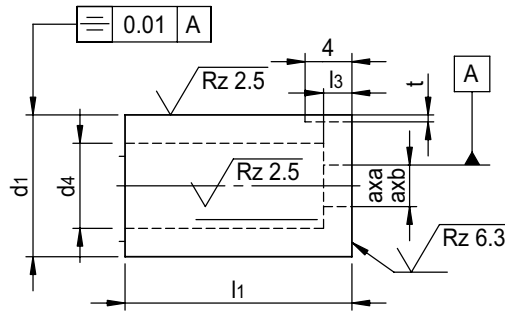
Mat.: HSS  
Härte: 64 ±2 HRC

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

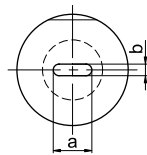
SE 715 EDF /  
20 x 25 / a x b

Buchsen ohne Verdrehsicherung  
auf Wunsch lieferbar (bei Bestellung  
angeben).

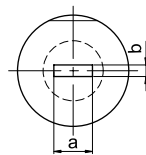
Bushings without rotation preven-  
tion available, please specify when  
ordering.



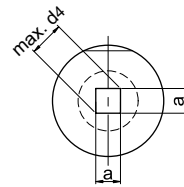
EDF



EDO



EDR



EDS



| d1<br>n5 | a x b<br>±0,01<br>Stufung/step<br>0,01<br>≥ ≤ | l3 | d4   | t   | l1<br>+0,5 |    |    |    |    |    |    |    |    |
|----------|---|----|------|-----|------------|----|----|----|----|----|----|----|----|
|          |   |    |      |     | 16         | 19 | 20 | 22 | 25 | 28 | 30 | 32 | 35 |
| 5        | 1,0 - 2,4                                     | 2  | 2,8  | 0,5 | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 6        | 1,6 - 3,0                                     | 3  | 3,5  | 0,5 | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 8        | 2,0 - 3,5                                     | 4  | 4,0  | 0,5 | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 10       | 2,5 - 5,0                                     | 4  | 5,8  | 2,0 | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 13       | 3,0 - 7,0                                     | 5  | 8,0  | 2,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 16       | 4,0 - 9,0                                     | 5  | 9,5  | 2,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 19*      | 5,0 - 10,0                                    | 4  | 11,0 | 2,0 |            | ●  |    |    | ●  |    | ●  | ●  |    |
| 20       | 6,0 - 11,0                                    | 8  | 12,0 | 2,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 22       | 8,0 - 11,0                                    | 8  | 12,0 | 2,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 25       | 8,0 - 16,0                                    | 8  | 17,3 | 2,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 32       | 8,0 - 20,0                                    | 8  | 20,7 | 2,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 38*      | 16,0 - 26,0                                   | 6  | 28,0 | 2,0 |            |    |    |    |    |    | ●  | ●  |    |
| 40       | 19,0 - 27,0                                   | 8  | 27,7 | 2,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 50       | 26,0 - 36,0                                   | 8  | 37,0 | 2,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 55*      | 35,0 - 41,0                                   | 8  | 42,0 | 2,0 |            |    |    |    |    |    | ●  | ●  |    |

\* = nicht nach ISO 8977A / not in acc. with ISO 8977A



**SE 717 . . . .**

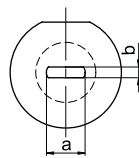
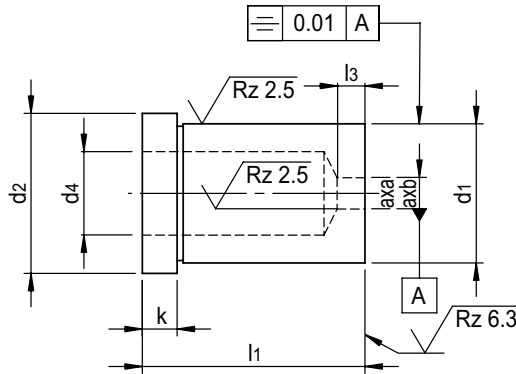
Mat.: HSS  
Härte: 64 ±2 HRC

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

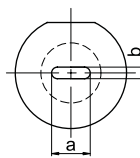
 **SE 717 EKDO / 20 x 25 / a x b**

Buchsen ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

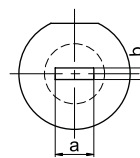
Bushings without rotation prevention available, please specify when ordering.



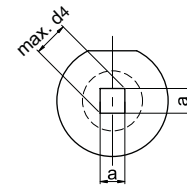
**EKDF**



**EKDO**



**EKDR**



**EKDS**



| d1<br>m5 | a x b<br>±0,01<br>Stufung/step<br>0,01<br>≥ ≤ | d2<br>+0,3 | l3 | k<br>+0,25 | d4   | l1<br>+0,5 |    |    |    |    |    |    |    |
|----------|---|------------|----|------------|------|------------|----|----|----|----|----|----|----|
|          |   |            |    |            |      | 16         | 20 | 22 | 25 | 28 | 30 | 32 | 35 |
| 5        | 1,0 - 2,4                                     | 8          | 2  | 5          | 2,8  | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 6        | 1,6 - 3,0                                     | 9          | 3  | 5          | 3,5  | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 8        | 2,0 - 3,5                                     | 11         | 4  | 5          | 4,0  | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 10       | 2,5 - 5,0                                     | 13         | 4  | 5          | 5,8  | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 13       | 3,0 - 7,0                                     | 16         | 5  | 5          | 8,0  |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 16       | 4,0 - 9,0                                     | 19         | 5  | 5          | 9,5  |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 19*      | 5,0 - 10,0                                    | 22         | 4  | 5          | 11,0 |            |    |    | ●  | ●  | ●  | ●  | ●  |
| 20       | 6,0 - 11,0                                    | 23         | 8  | 5          | 12,0 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 22       | 8,0 - 14,0                                    | 25         | 8  | 5          | 15,0 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 25       | 8,0 - 16,0                                    | 28         | 8  | 5          | 17,3 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 32       | 8,0 - 20,0                                    | 35         | 8  | 5          | 20,7 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 38*      | 16,0 - 26,0                                   | 42         | 6  | 5          | 28,0 |            |    |    |    | ●  |    | ●  | ●  |
| 40       | 19,0 - 27,0                                   | 43         | 8  | 5          | 27,7 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 50       | 26,0 - 36,0                                   | 53         | 8  | 5          | 37,0 |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 55*      | 35,0 - 41,0                                   | 58         | 8  | 5          | 42,0 |            |    |    |    |    |    |    | ●  |

\* = nicht nach ISO 8977B / not in acc. with ISO 8977B



**SE 711 EDL**

Type EDL, ohne Bund

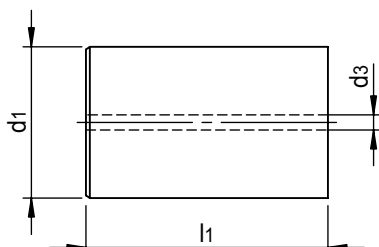
Type EDL, without collar

 **SE 711 EDL /  
20 x 35**

Mat.: HSS  
Härte: 64 ±2 HRC

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

Andere Längen auf Wunsch lieferbar. Other lengths available on request.



| d1<br>n5 | d3  | l1<br>+0,5<br>35 |
|----------|-----|------------------|
| 5        | 1,5 | ●                |
| 6        | 1,5 | ●                |
| 8        | 2   | ●                |
| 10       | 3   | ●                |
| 13       | 3   | ●                |
| 16       | 3   | ●                |
| 19*      | 3   | ●                |
| 20       | 4   | ●                |
| 22       | 4   | ●                |
| 25       | 4   | ●                |
| 32       | 4   | ●                |
| 38*      | 5   | ●                |
| 40       | 5   | ●                |
| 50       | 5   | ●                |
| 55*      | 5   | ●                |

\* = nicht nach ISO 8977A / not in acc. with ISO 8977A

[SE]



**SE 713 EKDL**

Type EKDL, mit Bund

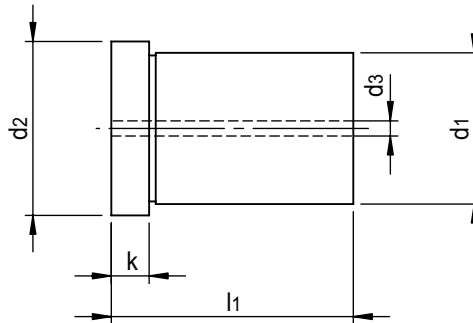
Mat.: HSS  
Härte: 64 ±2 HRC

Type EKDL, with collar

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

 **SE 713 EKDL / 20 x 35**

Andere Längen auf Wunsch lieferbar. Other lengths available on request.



[SE]

| d1<br>m5 | d2 | d3  | k<br>+0,25 | l1<br>+0,5<br>35 |
|----------|----|-----|------------|------------------|
| 5        | 8  | 1,5 | 5          | ●                |
| 6        | 9  | 1,5 | 5          | ●                |
| 8        | 11 | 2   | 5          | ●                |
| 10       | 13 | 3   | 5          | ●                |
| 13       | 16 | 3   | 5          | ●                |
| 16       | 19 | 3   | 5          | ●                |
| 19*      | 22 | 3   | 5          | ●                |
| 20       | 23 | 4   | 5          | ●                |
| 22       | 25 | 4   | 5          | ●                |
| 25       | 28 | 4   | 5          | ●                |
| 32       | 35 | 4   | 5          | ●                |
| 38*      | 42 | 5   | 5          | ●                |
| 40       | 43 | 5   | 5          | ●                |
| 50       | 53 | 5   | 5          | ●                |
| 55*      | 58 | 5   | 5          | ●                |

\* = nicht nach ISO 8977B / not in acc. with ISO 8977B



**SE 711 EDM**

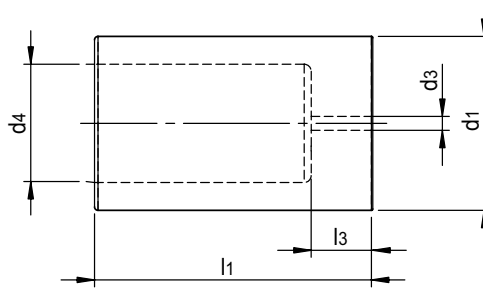
Type EDM, ohne Bund

Mat.: HSS  
Härte: 64 ±2 HRC

Type EDM, without collar

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

 **SE 711 EDM /  
20 x 35**



| d1<br>n5 | d3  | l3 | d4   | l1<br>+0,5 |    |    |    |    |    |    |    |    |
|----------|-----|----|------|------------|----|----|----|----|----|----|----|----|
|          |     |    |      | 16         | 19 | 20 | 22 | 25 | 28 | 30 | 32 | 35 |
| 5        | 1,5 | 2  | 2,8  | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 6        | 1,5 | 3  | 3,5  | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 8        | 2,0 | 4  | 4,0  | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 10       | 3,0 | 4  | 5,8  | ●          |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 13       | 3,0 | 5  | 8,0  |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 16       | 3,0 | 5  | 9,5  |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 19*      | 3,0 | 5  | 11,0 |            | ●  |    |    | ●  |    | ●  | ●  |    |
| 20       | 4,0 | 8  | 12,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 22       | 4,0 | 8  | 15,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 25       | 4,0 | 8  | 17,3 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 32       | 4,0 | 8  | 20,7 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 38*      | 5,0 | 6  | 28,0 |            |    |    |    |    |    | ●  | ●  |    |
| 40       | 5,0 | 8  | 27,7 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 50       | 5,0 | 8  | 37,0 |            |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 55*      | 5,0 | 8  | 42,0 |            |    |    |    |    |    | ●  | ●  |    |

\* = nicht nach ISO 8977A / not in acc. with ISO 8977A

[SE]



**SE 713 EKDM**

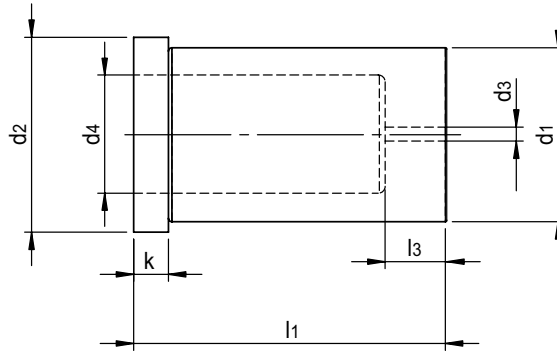
Type EKDM, mit Bund

Mat.: HSS  
Härte: 64 ±2 HRC

Type EKDM, with collar

Mat.: HSS (e.g. M2)  
Hardness: 64 ±2 HRC

 **SE 713 EKDM / 20 x 35**



[SE]

| d1<br>m5 | d3  | d2<br>+0,3 | l3  | d4   | k<br>+0,25 | l1<br>+0,5 |    |    |    |    |    |    |    |
|----------|-----|------------|-----|------|------------|------------|----|----|----|----|----|----|----|
|          |     |            |     |      |            | 16         | 20 | 22 | 25 | 28 | 30 | 32 | 35 |
| 5        | 1,5 | 8          | 2,0 | 2,8  | 5          | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 6        | 1,5 | 9          | 3,0 | 3,5  | 5          | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 8        | 2,0 | 11         | 4,0 | 4,0  | 5          | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 10       | 3,0 | 13         | 4,0 | 5,8  | 5          | ●          | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 13       | 3,0 | 16         | 5,0 | 8,0  | 5          |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 16       | 3,0 | 19         | 5,0 | 9,5  | 5          |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 19*      | 3,0 | 22         | 4,0 | 11,0 | 5          |            |    |    | ●  | ●  | ●  | ●  | ●  |
| 20       | 4,0 | 23         | 8,0 | 12,0 | 5          |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 22       | 4,0 | 25         | 8,0 | 15,0 | 5          |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 25       | 4,0 | 28         | 8,0 | 17,3 | 5          |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 32       | 4,0 | 35         | 8,0 | 20,7 | 5          |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 38*      | 5,0 | 42         | 6,0 | 28,0 | 5          |            |    |    |    | ●  |    | ●  | ●  |
| 40       | 5,0 | 43         | 8,0 | 27,7 | 5          |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 50       | 5,0 | 53         | 8,0 | 37,0 | 5          |            | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 55*      | 5,0 | 58         | 8,0 | 42,0 | 5          |            |    |    |    |    |    |    | ●  |

\* = nicht nach ISO 8977B / not in acc. with ISO 8977B

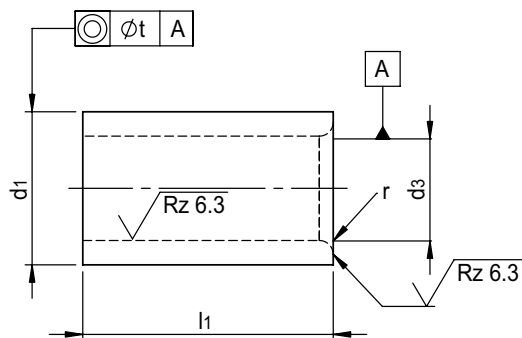


### SE 793

Mat.: Einsatzstahl  
Härte: 62 ±2 HRC

Mat.: Case-hardening steel  
Hardness: 62 ±2 HRC

SE 793 / 3,0



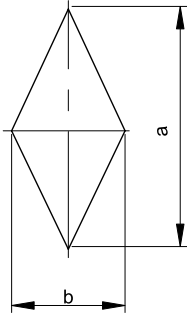
| d3<br>H7  | Stufung<br>Graduation | d1<br>n6 | l1 | r   | t    |
|-----------|-----------------------|----------|----|-----|------|
| 1,0       | 0,1                   | 5        | 9  | 1,0 | 0,01 |
| 1,1-2,0   | 0,1                   | 6        | 12 | 1,0 | 0,01 |
| 2,1-3,0   | 0,1                   | 7        | 12 | 1,0 | 0,01 |
| 3,1-4,0   | 0,1                   | 8        | 12 | 1,0 | 0,01 |
| 4,1-5,0   | 0,1                   | 10       | 16 | 1,0 | 0,01 |
| 5,1-6,0   | 0,1                   | 12       | 16 | 1,5 | 0,02 |
| 6,1-8,0   | 0,1                   | 15       | 20 | 1,5 | 0,02 |
| 8,1-10,0  | 0,1                   | 18       | 20 | 2,0 | 0,02 |
| 10,1-12,0 | 0,1                   | 22       | 28 | 2,0 | 0,02 |
| 12,1-15,0 | 0,1                   | 26       | 28 | 2,0 | 0,02 |
| 15,5-18,0 | 0,5                   | 30       | 36 | 2,0 | 0,02 |

[SE]

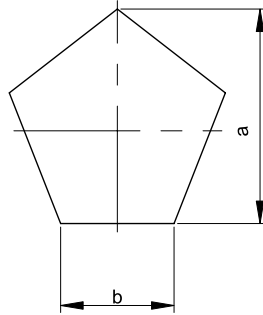




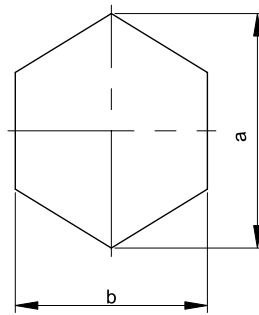
SP1



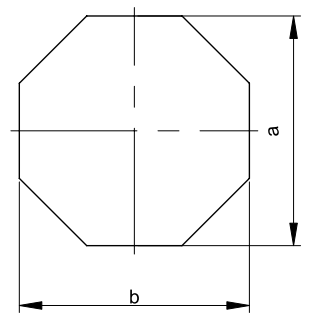
SP2



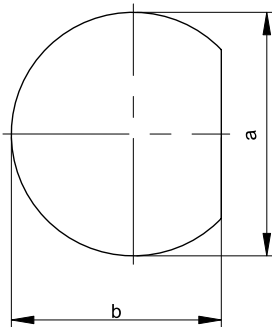
SP3



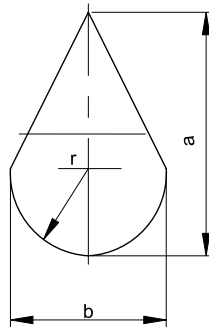
SP4



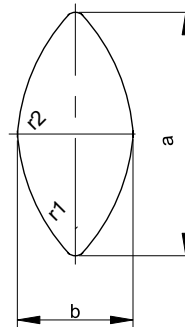
SP5



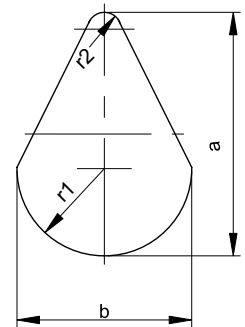
SP6



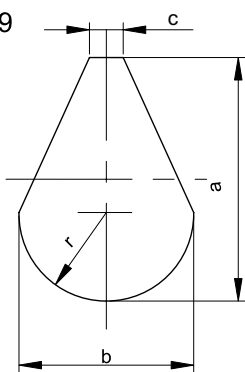
SP7



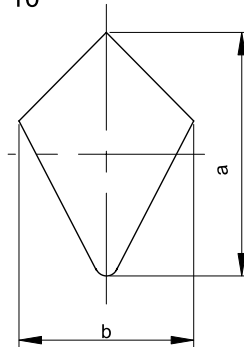
SP8



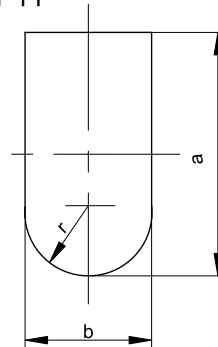
SP9



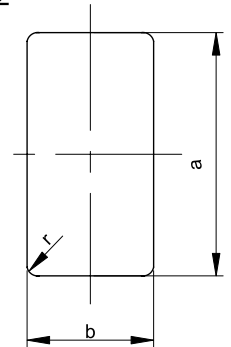
SP10



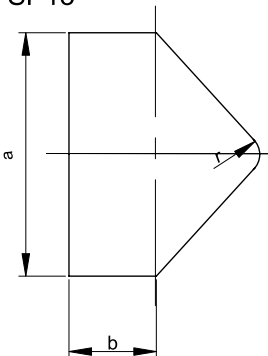
SP11



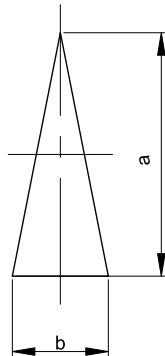
SP12



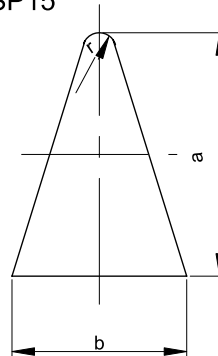
SP13



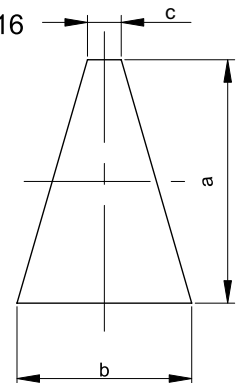
SP14



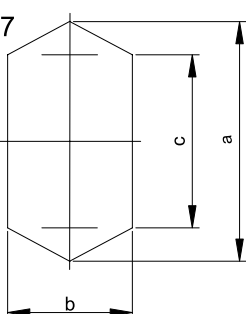
SP15



SP16



SP17



### SE 300

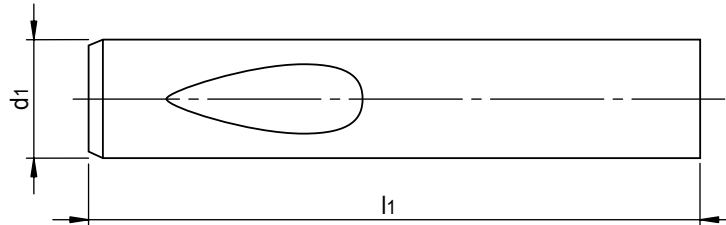
#### Schwere Ausführung

Mat.: HSS  
Härte: 60 - 63 HRC

#### Heavy duty

Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC

SE 300 / 13 x 80



| d1<br>g <sup>5</sup> | l1<br>+0,3 |    |    |    |     |     |     |
|----------------------|------------|----|----|----|-----|-----|-----|
|                      | 63         | 71 | 80 | 90 | 100 | 110 | 125 |
| 10                   | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 13                   | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 16                   | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 20                   | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 25                   |            | ●  | ●  | ●  | ●   | ●   | ●   |
| 32                   |            | ●  | ●  | ●  | ●   | ●   | ●   |
| 40                   |            |    | ●  | ●  | ●   | ●   | ●   |

[SE]



Ball lock punches

SCHNEIDELEMENTE / CUTTING ELEMENTS

**SE 320**

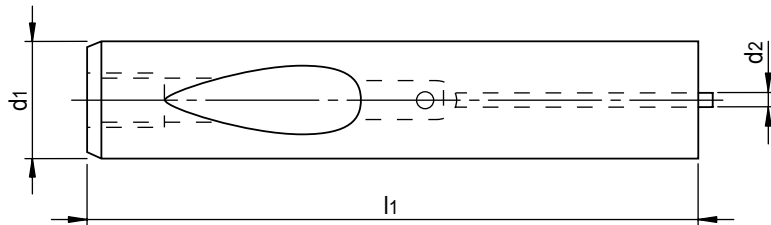
Schwere Ausführung  
mit federndem Auswerferstift

Heavy duty  
with spring ejector

 **SE 320 / 13 x 80**

Mat.: HSS  
Härte: 60 - 63 HRC

Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC



[SE]

| d1<br>g5 | d2  | l1 |    |    |            |     |     |     |
|----------|-----|----|----|----|------------|-----|-----|-----|
|          |     | 63 | 71 | 80 | 90<br>+0,3 | 100 | 110 | 125 |
| 10       | 1,5 | ●  | ●  | ●  | ●          | ●   |     |     |
| 13       | 1,5 | ●  | ●  | ●  | ●          | ●   | ●   | ●   |
| 16       | 1,5 | ●  | ●  | ●  | ●          | ●   | ●   | ●   |
| 20       | 2,4 | ●  | ●  | ●  | ●          | ●   | ●   | ●   |
| 25       | 2,4 |    | ●  | ●  | ●          | ●   | ●   | ●   |
| 32       | 2,4 |    | ●  | ●  | ●          | ●   | ●   | ●   |
| 40       | 2,4 |    |    | ●  | ●          | ●   | ●   | ●   |



SE 301

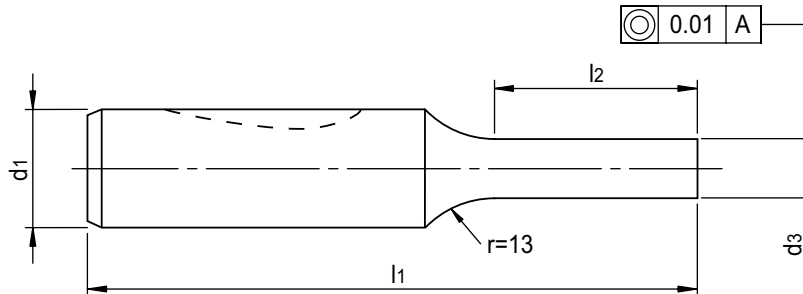
Schwere Ausführung

Heavy duty

SE 301 /  
20 x 19 x 80 / d3

Mat.: HSS  
Härte: 60 - 63 HRC

Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC



| d1<br>g5 | d3<br>min.<br>+0,01 | l2<br>+1 |    |    |    | l1<br>+0,3 |    |    |    |     |     |     |
|----------|---------------------|----------|----|----|----|------------|----|----|----|-----|-----|-----|
|          |                     | 10       | 13 | 19 | 25 | 63         | 71 | 80 | 90 | 100 | 110 | 125 |
| 10       | 2,1                 | ●        | ●  | ●  |    | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 13       | 5                   |          | ●  | ●  |    | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 16       | 8                   |          | ●  | ●  | ●  | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 20       | 12                  |          | ●  | ●  | ●  | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 25       | 16                  |          | ●  | ●  | ●  |            | ●  | ●  | ●  | ●   | ●   | ●   |
| 32       | 24                  |          | ●  | ●  | ●  |            | ●  | ●  | ●  | ●   | ●   | ●   |
| 40       | 30                  |          |    | ●  | ●  |            |    | ●  | ●  | ●   | ●   | ●   |

[SE]



# Schnellwechsel-Schneidstempel, abgesetzter Schaft

## Ball lock punches, shouldered shank



SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 321

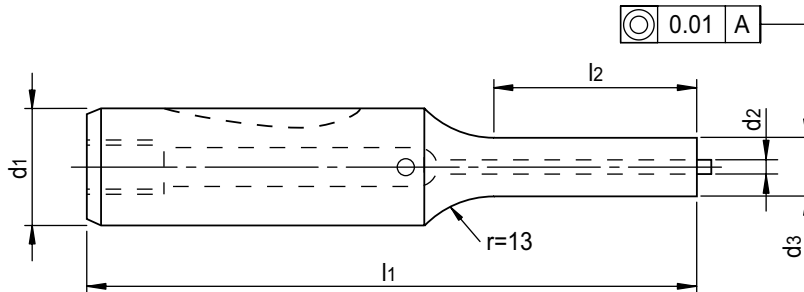
Schwere Ausführung  
mit federndem Auswerferstift

Heavy duty  
with spring ejector

SE 321 /  
20 x 13 x 80 / d3

Mat.: HSS  
Härte: 60 - 63 HRC

Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC



| d1<br>g5 | d2  | d3<br>min.<br>+0,01 | l2<br>+1 |    |    |    | l1<br>+0,3 |    |    |    |     |     |     |   |
|----------|-----|---------------------|----------|----|----|----|------------|----|----|----|-----|-----|-----|---|
|          |     |                     | 10       | 13 | 19 | 25 | 63         | 71 | 80 | 90 | 100 | 110 | 125 |   |
| 10       | 1,5 | 2,1                 | ●        | ●  | ●  |    | ●          | ●  | ●  | ●  | ●   | ●   | ●   |   |
| 13       | 1,5 | 5                   |          | ●  | ●  |    | ●          | ●  | ●  | ●  | ●   | ●   | ●   | ● |
| 16       | 1,5 | 8                   |          | ●  | ●  | ●  | ●          | ●  | ●  | ●  | ●   | ●   | ●   | ● |
| 20       | 2,4 | 12                  |          | ●  | ●  | ●  | ●          | ●  | ●  | ●  | ●   | ●   | ●   | ● |
| 25       | 2,4 | 16                  |          | ●  | ●  | ●  |            | ●  | ●  | ●  | ●   | ●   | ●   | ● |
| 32       | 2,4 | 24                  |          | ●  | ●  | ●  |            | ●  | ●  | ●  | ●   | ●   | ●   | ● |
| 40       | 2,4 | 30                  |          |    | ●  | ●  |            |    | ●  | ●  | ●   | ●   | ●   | ● |

[SE]



SE 302 .

Schwere Ausführung

Mat.: HSS  
Härte: 60 - 63 HRC

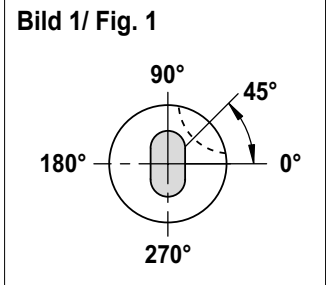
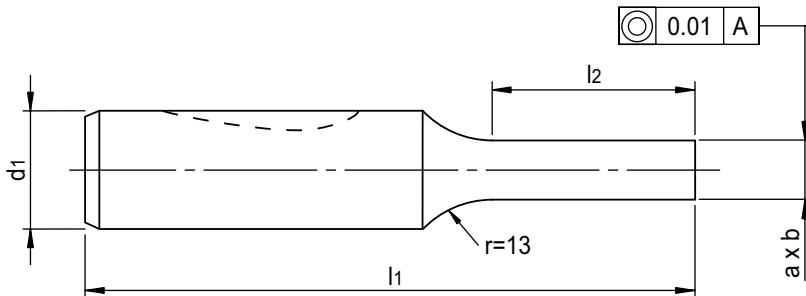
Bei der Bestellung bitte die Position der Kugellage angeben (Bild 1).

Heavy duty

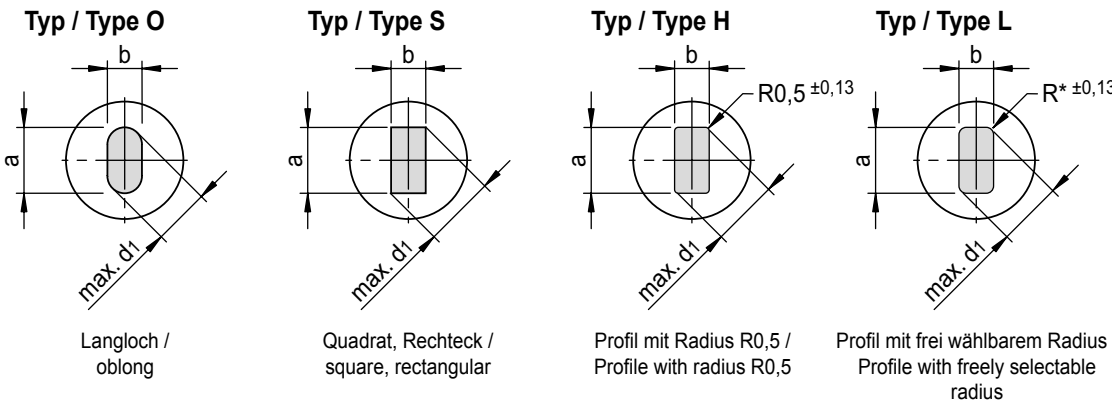
Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC

When ordering, please specify the ball position (Fig. 1).

SE 302 O / 20 x 19 x 80 / a x b / 45°



[SE]



\* Bei Typ L ist der Radius R frei wählbar. Bitte bei der Bestellung den Radius angeben.  
\* With type L the radius R is freely selectable. Please specify the radius when ordering.



| d1<br>g5 | a<br>min.<br>±0,01 | b<br>min.<br>±0,01 | l2<br>+1 |    |    |    | l1<br>+0,3 |    |    |    |     |     |     |
|----------|--------------------|--------------------|----------|----|----|----|------------|----|----|----|-----|-----|-----|
|          |                    |                    | 10       | 13 | 19 | 25 | 63         | 71 | 80 | 90 | 100 | 110 | 125 |
| 10       | 2,1                | 2,1                | ●        | ●  | ●  |    | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 13       | 5                  | 4,5                |          | ●  | ●  |    | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 16       | 8                  | 6                  |          | ●  | ●  | ●  | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 20       | 12                 | 8                  |          | ●  | ●  | ●  | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 25       | 16                 | 10                 |          | ●  | ●  | ●  |            | ●  | ●  | ●  | ●   | ●   | ●   |
| 32       | 24                 | 12,5               |          | ●  | ●  | ●  |            | ●  | ●  | ●  | ●   | ●   | ●   |
| 40       | 30                 | 14                 |          |    | ●  | ●  |            |    | ●  | ●  | ●   | ●   | ●   |



### SE 322 .

**Schwere Ausführung mit federndem Auswerferstift**

**Heavy duty with spring ejector**

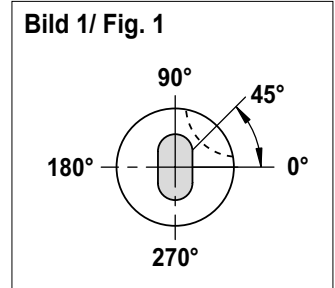
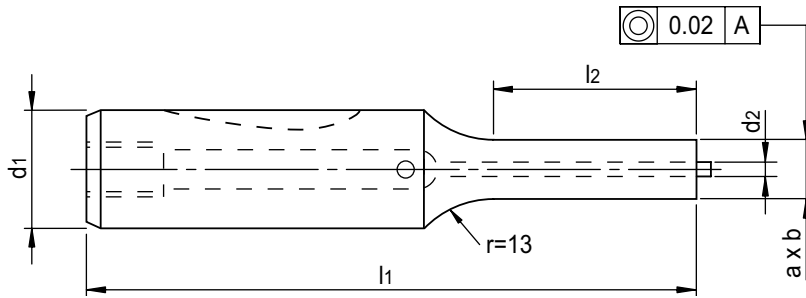
**SE 322 O / 20 x 19 x 80 / a x b / 45°**

Mat.: HSS  
Härte: 60 - 63 HRC

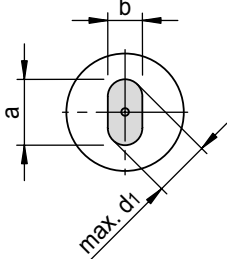
Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC

Bei der Bestellung bitte die Position der Kugellage angeben (Bild 1).

When ordering, please specify the ball position (Fig. 1).

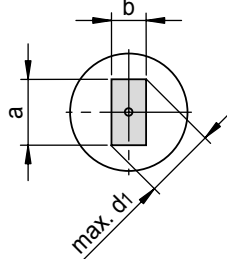


Typ / Type O



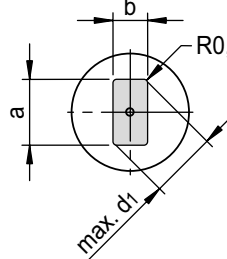
Langloch / oblong

Typ / Type S



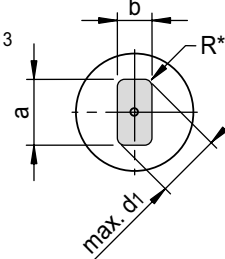
Quadrat, Rechteck / square, rectangular

Typ / Type H



Profil mit Radius R0,5 / Profile with radius R0,5

Typ / Type L



Profil mit frei wählbarem Radius / Profile with freely selectable radius

\* Bei Typ L ist der Radius R frei wählbar. Bitte bei der Bestellung den Radius angeben.

\* With type L the radius R is freely selectable. Please specify the radius when ordering.



| d1<br>g5 | d2  | a<br>min.<br>±0,01 | b<br>min.<br>±0,01 | l2<br>+1 |    |    |    | l1<br>+0,3 |    |    |    |     |     |     |
|----------|-----|--------------------|--------------------|----------|----|----|----|------------|----|----|----|-----|-----|-----|
|          |     |                    |                    | 10       | 13 | 19 | 25 | 63         | 71 | 80 | 90 | 100 | 110 | 125 |
| 10       | 1,5 | 2,1                | 2,1                | ●        | ●  | ●  |    | ●          | ●  | ●  | ●  | ●   | ●   |     |
| 13       | 1,5 | 5                  | 4,5                |          | ●  | ●  |    | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 16       | 1,5 | 8                  | 6                  |          | ●  | ●  | ●  | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 20       | 2,4 | 12                 | 8                  |          | ●  | ●  | ●  | ●          | ●  | ●  | ●  | ●   | ●   | ●   |
| 25       | 2,4 | 16                 | 10                 |          | ●  | ●  | ●  |            | ●  | ●  | ●  | ●   | ●   | ●   |
| 32       | 2,4 | 24                 | 12,5               |          | ●  | ●  | ●  |            | ●  | ●  | ●  | ●   | ●   | ●   |
| 40       | 2,4 | 30                 | 14                 |          |    | ●  | ●  |            |    | ●  | ●  | ●   | ●   | ●   |

Ball lock punches, inverted

SCHNEIDELEMENTE / CUTTING ELEMENTS

**SE 303**

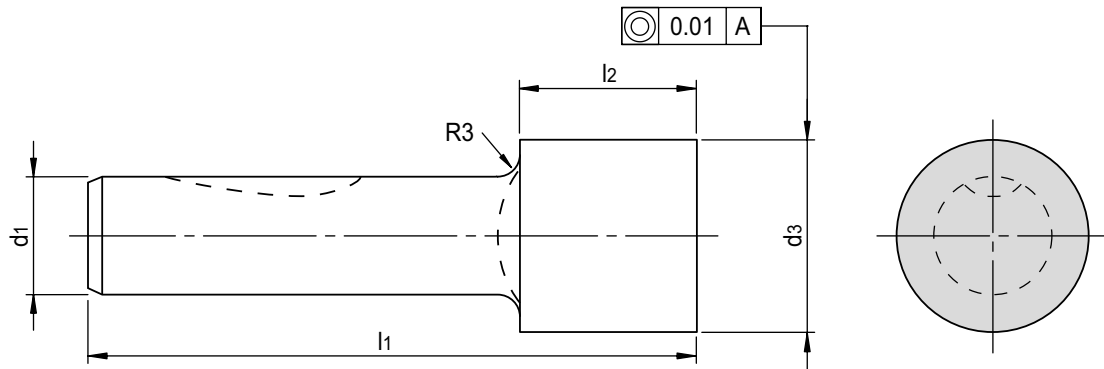
Schwere Ausführung

Heavy duty

**SE 303 /  
20 x 30 x 71 / d3**

Mat.: HSS  
Härte: 60 - 63 HRC

Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC



| d1<br>g5 | d3<br>min.<br>+0,01 | d3<br>max.<br>+0,01 | l2<br>+1 |    | l1<br>+0,3 |    |    |     |
|----------|---------------------|---------------------|----------|----|------------|----|----|-----|
|          |                     |                     | 19       | 30 | 71         | 80 | 90 | 100 |
| 13       | 13,1                | 32                  | ●        | ●  | ●          | ●  | ●  | ●   |
| 16       | 16,1                | 38                  | ●        | ●  | ●          | ●  | ●  | ●   |
| 20       | 20,1                | 40                  | ●        | ●  | ●          | ●  | ●  | ●   |
| 25       | 25,1                | 44                  | ●        | ●  | ●          | ●  | ●  | ●   |
| 32       | 32,1                | 50                  | ●        | ●  |            | ●  | ●  | ●   |
| 40       | 40,1                | 56                  | ●        | ●  |            | ●  | ●  | ●   |

[SE]





**SE 323**

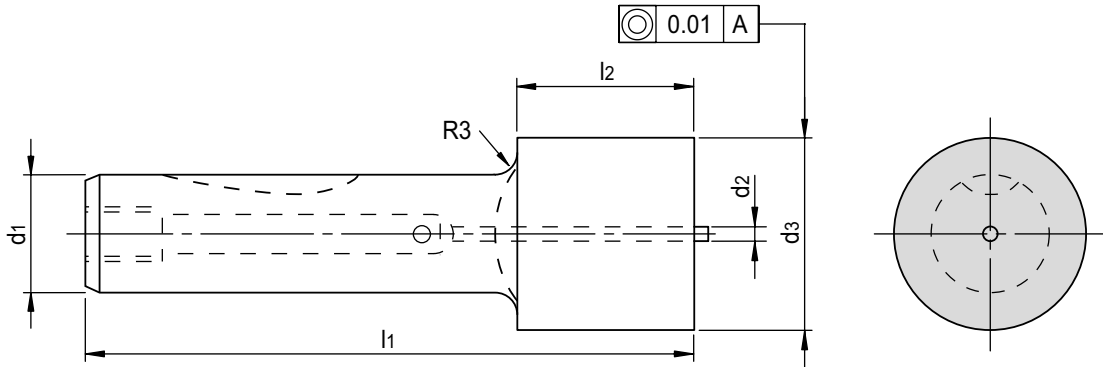
Schwere Ausführung  
mit federndem Auswerferstift

Heavy duty  
with spring ejector

**SE 323 /**  
**20 x 30 x 71 / d3**

Mat.: HSS  
Härte: 60 - 63 HRC

Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC



| d1<br>g5 | d2  | d3<br>min.<br>+0,01 | d3<br>max.<br>+0,01 | l2<br>+1 |    |    | l1<br>+0,3 |    |     |
|----------|-----|---------------------|---------------------|----------|----|----|------------|----|-----|
|          |     |                     |                     | 19       | 30 | 71 | 80         | 90 | 100 |
| 13       | 1,5 | 13,1                | 32                  | ●        | ●  | ●  | ●          | ●  | ●   |
| 16       | 1,5 | 16,1                | 38                  | ●        | ●  | ●  | ●          | ●  | ●   |
| 20       | 2,4 | 20,1                | 40                  | ●        | ●  | ●  | ●          | ●  | ●   |
| 25       | 2,4 | 25,1                | 44                  | ●        | ●  | ●  | ●          | ●  | ●   |
| 32       | 2,4 | 32,1                | 50                  | ●        | ●  |    | ●          | ●  | ●   |
| 40       | 2,4 | 40,1                | 56                  | ●        | ●  |    | ●          | ●  | ●   |

[SE]



SE 304 .

Schwere Ausführung

Heavy duty

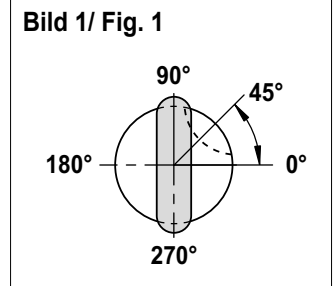
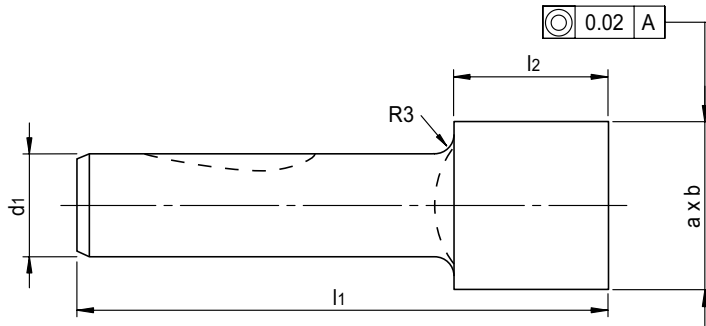
Mat.: HSS  
Härte: 60 - 63 HRC

Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC

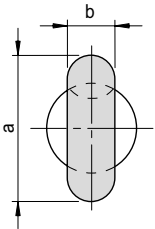
Bei der Bestellung bitte die Position der Kugellage angeben (Bild 1).

When ordering, please specify the ball position (Fig. 1).

SE 304 O / 20 x 30 x 80 / a x b / 45°

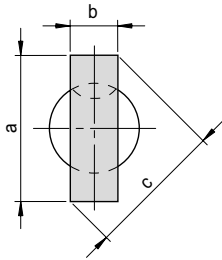


Typ / Type O



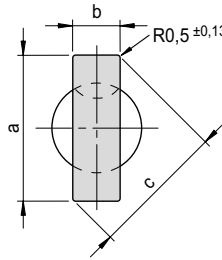
Langloch / oblong

Typ / Type S



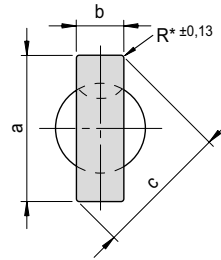
Quadrat, Rechteck / square, rectangular

Typ / Type H



Profil mit Radius R0,5 / Profile with radius R0,5

Typ / Type L



Profil mit frei wählbarem Radius / Profile with freely selectable radius

\* Bei Typ L ist der Radius R frei wählbar. Bitte bei der Bestellung den Radius angeben.

\* With type L the radius R is freely selectable. Please specify the radius when ordering.



| d1<br>g <sup>5</sup> | a<br>max.<br>±0,01 | b<br>min.<br>±0,01 | c<br>max. | l2<br>+1 |    | l1<br>+0,3 |    |    |     |
|----------------------|--------------------|--------------------|-----------|----------|----|------------|----|----|-----|
|                      |                    |                    |           | 19       | 30 | 71         | 80 | 90 | 100 |
| 13                   | 32                 | 5                  | 32        | ●        | ●  | ●          | ●  | ●  | ●   |
| 16                   | 38                 | 6,5                | 38        | ●        | ●  | ●          | ●  | ●  | ●   |
| 20                   | 40                 | 8                  | 40        | ●        | ●  | ●          | ●  | ●  | ●   |
| 25                   | 44                 | 11                 | 44        | ●        | ●  | ●          | ●  | ●  | ●   |
| 32                   | 50                 | 12,5               | 50        | ●        | ●  | ●          | ●  | ●  | ●   |
| 40                   | 56                 | 14                 | 56        | ●        | ●  | ●          | ●  | ●  | ●   |



**SE 324 .**

**Schwere Ausführung mit federndem Auswerferstift**

**Heavy duty with spring ejector**

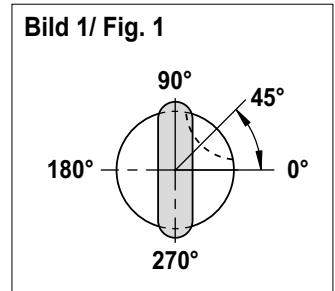
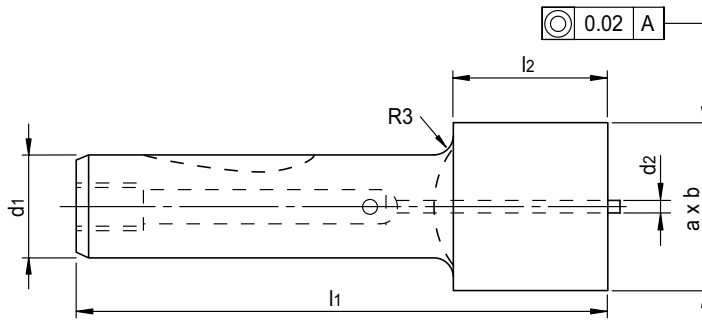
**SE 324 O/ 20 x 30 x 80 / a x b / 45°**

Mat.: HSS  
Härte: 60 - 63 HRC

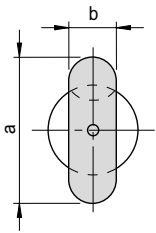
Mat.: HSS (e.g. M2)  
Hardness: 60 - 63 HRC

Bei der Bestellung bitte die Position der Kugellage angeben (Bild 1).

When ordering, please specify the ball position (Fig. 1).

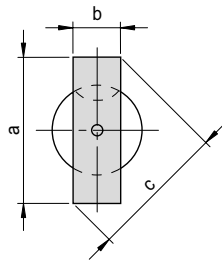


Typ / Type O



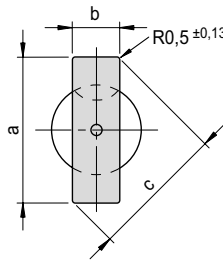
Langloch / oblong

Typ / Type S



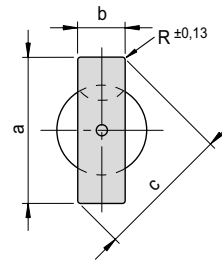
Quadrat, Rechteck / square, rectangular

Typ / Type H



Profil mit Radius R0,5 / Profile with radius R0,5

Typ / Type L



Profil mit frei wählbarem Radius / Profile with freely selectable radius

\* Bei Typ L ist der Radius R frei wählbar. Bitte bei der Bestellung den Radius angeben.

\* With type L the radius R is freely selectable. Please specify the radius when ordering.



| d1<br>g5 | d2  | a<br>max.<br>±0,01 | b<br>min.<br>±0,01 | c<br>max. | l2<br>+1 |    | l1<br>+0,3 |    |    |     |
|----------|-----|--------------------|--------------------|-----------|----------|----|------------|----|----|-----|
|          |     |                    |                    |           | 19       | 30 | 71         | 80 | 90 | 100 |
| 13       | 1,5 | 32                 | 5                  | 32        | ●        | ●  | ●          | ●  | ●  | ●   |
| 16       | 1,5 | 38                 | 6,5                | 38        | ●        | ●  | ●          | ●  | ●  | ●   |
| 20       | 2,4 | 40                 | 8                  | 40        | ●        | ●  | ●          | ●  | ●  | ●   |
| 25       | 2,4 | 44                 | 11                 | 44        | ●        | ●  | ●          | ●  | ●  | ●   |
| 32       | 2,4 | 50                 | 12,5               | 50        | ●        | ●  | ●          | ●  | ●  | ●   |
| 40       | 2,4 | 56                 | 14                 | 56        | ●        | ●  | ●          | ●  | ●  | ●   |

**SE 340**

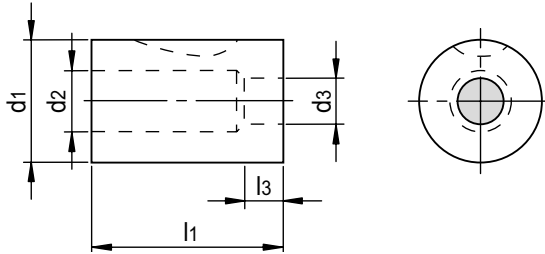
Leichte Ausführung

Light duty

 **SE 340 / 20 / d3**

Mat.: HWS  
Härte: 60 - 63 HRC

Mat.: HWS (e.g. A2)  
Hardness: 60 - 63 HRC



| d1<br>g5 | d3<br>+0,01<br>≥ ≤ | d2<br>max. | l1<br>+0,3 | l3 |
|----------|--------------------|------------|------------|----|
| 13       | 1,5 - 5,0          | 6          | 32         | 4  |
| 16       | 3,2 - 7,0          | 8          | 32         | 5  |
| 20       | 4,0 - 11,0         | 12         | 32         | 5  |
| 25       | 8,0 - 15,0         | 16         | 32         | 6  |
| 32       | 11,0 - 19,0        | 20         | 32         | 6  |
| 38       | 16,5 - 26,0        | 27         | 32         | 8  |

[SE]



## Ball lock die buttons, profiles

SCHNEIDELEMENTE / CUTTING ELEMENTS

### SE 341 .

#### Leichte Ausführung

Mat.: HWS  
Härte: 60 - 63 HRC

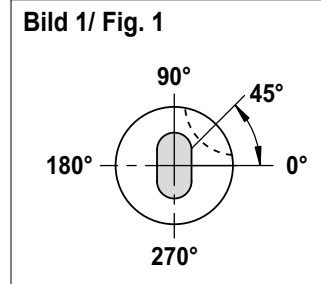
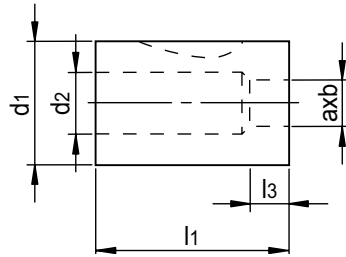
Bei der Bestellung bitte die Position der Kugellage angeben (Bild 1).

#### Light duty

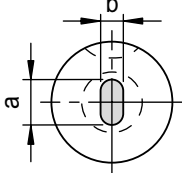
Mat.: HWS (e.g. A2)  
Hardness: 60 - 63 HRC

When ordering, please specify the ball position (Fig. 1).

SE 341 S / 16 /  
a x b / 45°

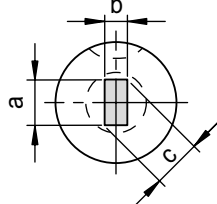


#### Typ / Type O



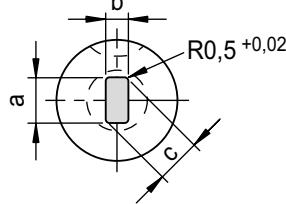
Langloch /  
oblong

#### Typ / Type S



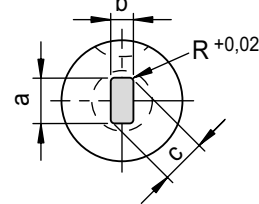
Quadrat, Rechteck /  
square, rectangular

#### Typ / Type H



Profil mit Radius R0,5 /  
Profile with radius R0,5

#### Typ / Type L



Profil mit frei wählbarem Radius /  
Profile with freely selectable  
radius

\* Bei Typ L ist der Radius R frei wählbar. Bitte bei der Bestellung den Radius angeben.

\* With type L the radius R is freely selectable. Please specify the radius when ordering.



| d1<br>g5 | a<br>+0,02<br>≥ ≤ | b<br>+0,02<br>≥ ≤ | d2<br>max. | c<br>max. | l1<br>+0,3 | l3 |
|----------|-------------------|-------------------|------------|-----------|------------|----|
| 13       | 1,5 - 5,0         | 1,2 - 5,0         | 6          | 5,0       | 32         | 4  |
| 16       | 3,2 - 7,0         | 2,0 - 7,0         | 8          | 7,0       | 32         | 5  |
| 20       | 4,0 - 11,0        | 2,4 - 11,0        | 12         | 11,0      | 32         | 5  |
| 25       | 8,0 - 15,0        | 4,0 - 15,0        | 16         | 15,0      | 32         | 6  |
| 32       | 11,0 - 19,0       | 4,8 - 19,0        | 20         | 19,0      | 32         | 6  |
| 38       | 16,5 - 26,0       | 6,4 - 26,0        | 27         | 26,0      | 32         | 8  |

### SE 390

#### Schwere Ausführung

Mat.: 1.7131, gegläht  
Härte: 56 ±2 HRC

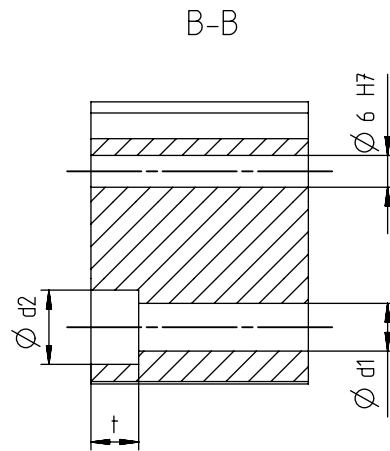
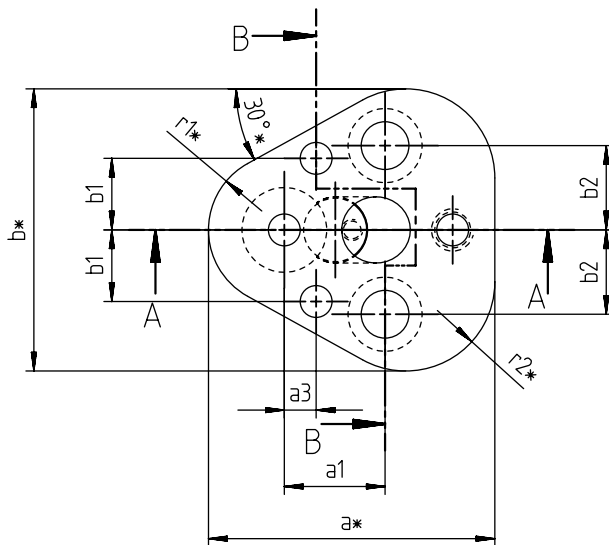
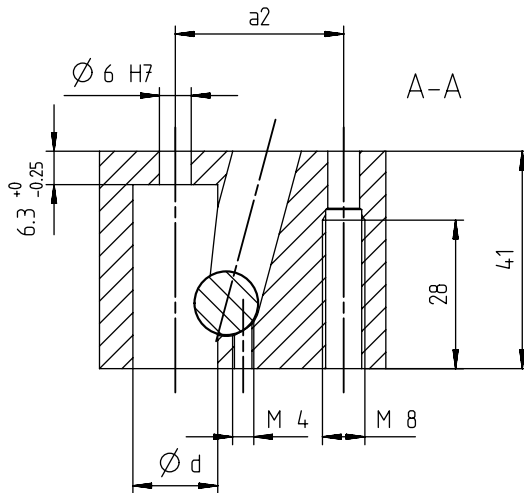
Lieferumfang:  
Zylinderkopfschrauben, Zylinderstifte  
und Gewindestift

#### Heavy duty

Mat.: 1.7131, annealed  
Hardness: 56 ±2 HRC

Included:  
Socket head cap screws, dowel pins  
and headless screw

SE 390 / 13



| d<br>H6 | a*   | b*   | a3<br>±0,01 | a1<br>±0,13 | a2<br>±0,01 | r1*  | r2*  | b1<br>±0,01 | b2<br>±0,13 | d1   | d2 | t  | Kugel-Ø<br>Ball-Ø | Schraube<br>Screw |
|---------|------|------|-------------|-------------|-------------|------|------|-------------|-------------|------|----|----|-------------------|-------------------|
| 10      | 44,5 | 43,7 | 7,5         | 19,0        | 26,93       | 9,5  | 12,0 | 9,0         | 11,1        | 9,0  | 15 | 9  | 10                | M8                |
| 13      | 50,8 | 50,0 | 6,5         | 19,0        | 29,97       | 12,7 | 15,2 | 12,0        | 14,3        | 9,0  | 15 | 9  | 12                | M8                |
| 16      | 54,0 | 53,2 | 6,0         | 19,0        | 31,75       | 14,3 | 16,8 | 13,5        | 15,9        | 9,0  | 15 | 9  | 12                | M8                |
| 20      | 60,3 | 59,5 | 5,0         | 19,0        | 33,53       | 17,5 | 20,0 | 16,5        | 17,5        | 11,0 | 18 | 11 | 12                | M10               |
| 25      | 69,9 | 69,1 | 7,0         | 23,8        | 40,64       | 22,2 | 24,7 | 22,0        | 19,8        | 13,5 | 20 | 13 | 12                | M12               |
| 32      | 69,9 | 69,1 | 7,0         | 23,8        | 40,64       | 22,2 | 24,7 | 22,0        | 19,8        | 13,5 | 20 | 13 | 12                | M12               |
| 40      | 77,4 | 76,6 | 10,0        | 27,0        | 43,99       | 26,0 | 28,5 | 26,0        | 24,0        | 13,5 | 20 | 13 | 12                | M12               |

\* Konturen können variieren. Größtmaße sind in der Tabelle angegeben.

\* Contours may vary. Maximum dimensions are given in the table.

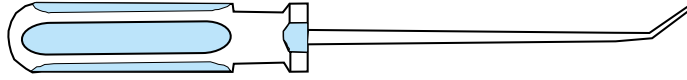


SE 360

abgewinkelte Ausführung

angular

 SE 360



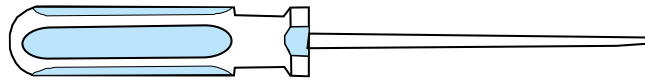
[SE]

SE 361

gerade Ausführung

straight

 SE 361

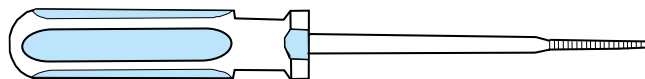


SE 362

Gewindeausführung

threaded

 SE 362

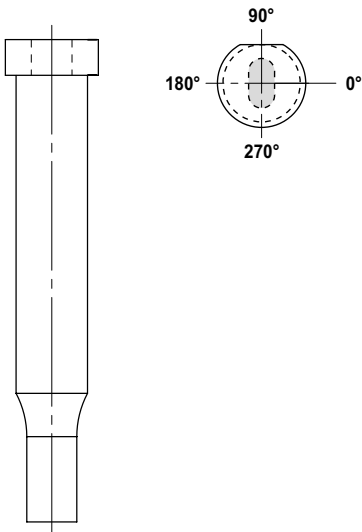




Profilierte Schneidstempel und die dazu passenden Schneidbuchsen werden von uns generell mit Verdrehsicherung ausgeliefert, wobei diese parallel zur langen Seite des Profils angebracht wird. Sollen Schneidelemente ohne Verdrehsicherung geliefert werden, muss darauf bei der Bestellung hingewiesen werden. Ebenso wenn die Verdrehsicherung an anderen Positionen oder in anderer Form gewählt werden soll, wie sie auf dieser Seite aufgeführt werden. Die Gradzahl ist frei wählbar und muss der Bestellnummer angehängt werden.

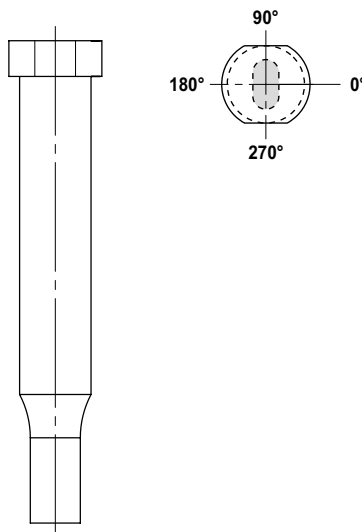
Shaped punches as well as the corresponding bushes are in general equipped with a rotation prevention, positioned alongside the longer side of the punching shape (round punches and bushes only upon request). If punches or bushes without a rotation prevention are needed, please specify during the ordering process. If a different location, shape or size (as shown below) for this purpose is requested, please specify as well. The angle is freely selectable and needs to be stated at the end of the ordering-number.

Verdrehsicherung / rotation prevention **Type V1**



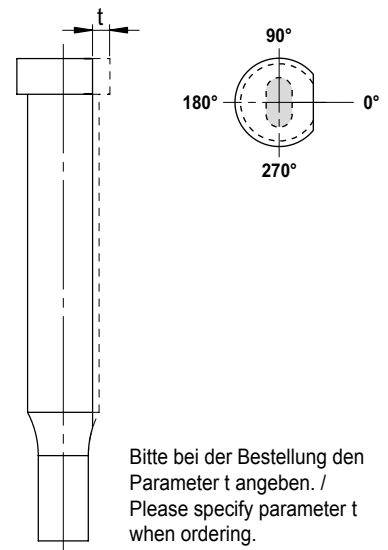
SE ... V1/ 90°

Verdrehsicherung / rotation prevention **Type V2**



SE ... V2/ 90°

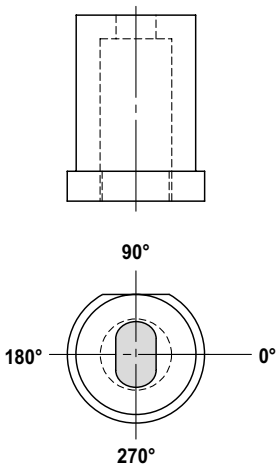
Verdrehsicherung / rotation prevention **Type V3**



Bitte bei der Bestellung den Parameter t angeben. / Please specify parameter t when ordering.

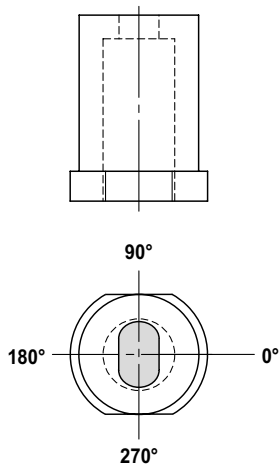
SE ... V3/ 4 / 0°

Verdrehsicherung / Rotation prevention **Type V4**



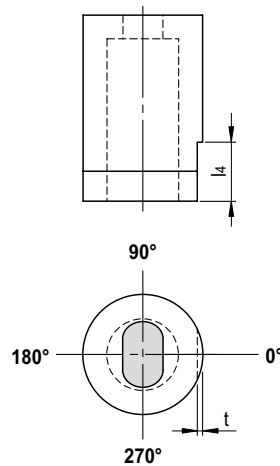
SE ... V4/ 90°

Verdrehsicherung / Rotation prevention **Type V5**



SE ... V5/ 90°

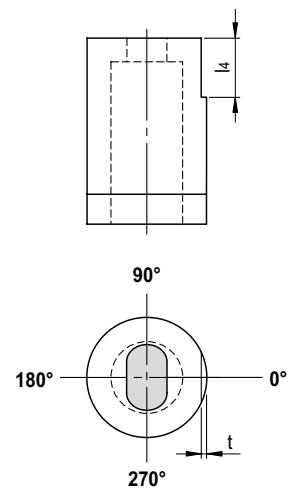
Verdrehsicherung / Rotation prevention **Type V6**



Bitte bei der Bestellung die Parameter t und l4 angeben. / Please specify parameter t and l4 when ordering.

SE ... V6/ 2 x 14 / 0°

Verdrehsicherung / Rotation prevention **Type V7**



Bitte bei der Bestellung die Parameter t und l4 angeben. / Please specify parameter t and l4 when ordering.

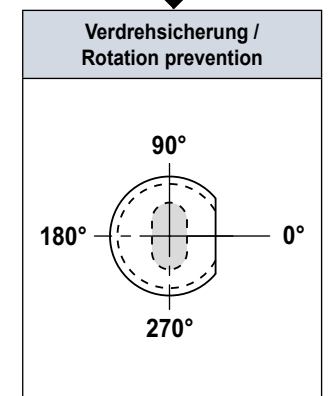
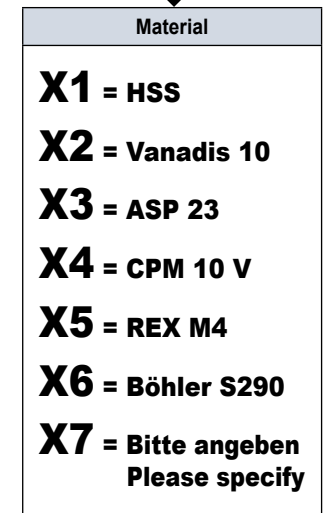
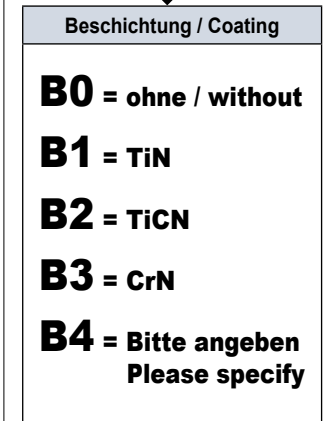
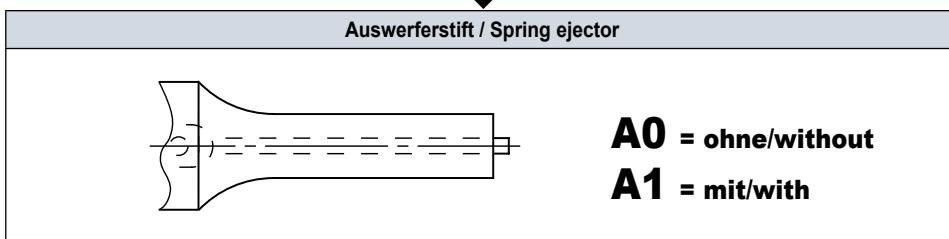
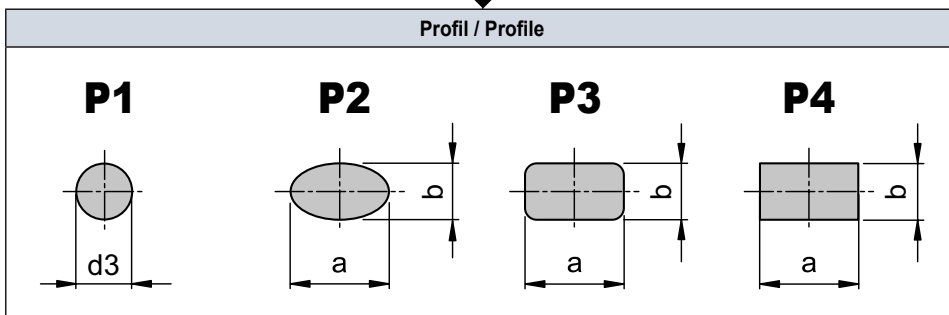
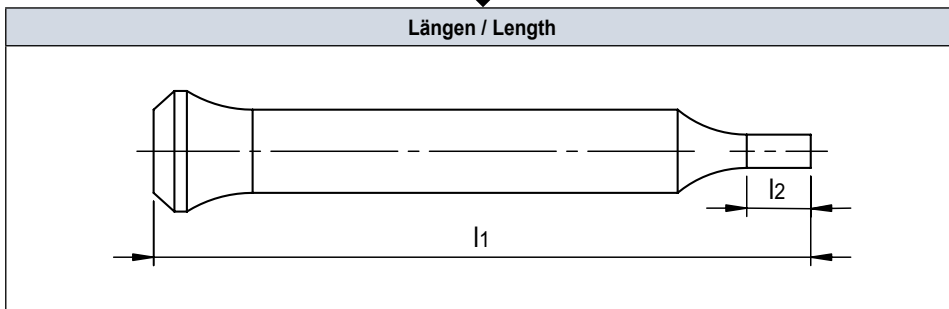
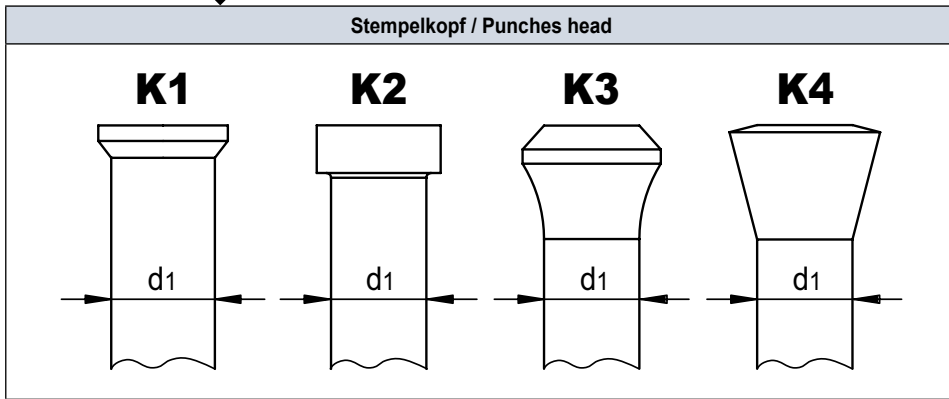
SE ... V7/ 2 x 14 / 0°





Bestellbeispiele / Ordering examples

|           |                             |           |           |           |                   |          |            |            |                                  |   |           |                              |                   |
|-----------|-----------------------------|-----------|-----------|-----------|-------------------|----------|------------|------------|----------------------------------|---|-----------|------------------------------|-------------------|
| <b>SE</b> | <b>K3</b>                   | <b>10</b> | <b>90</b> | <b>13</b> | <b>P2</b>         | <b>-</b> | <b>8,0</b> | <b>5,0</b> | <b>A1</b>                        | <b>45°</b>                                      | <b>X1</b> | <b>B1</b>                    | <b>5</b>          |
|           | Stempelkopf<br>Punches head | d1        | l1        | l2        | Profil<br>Profile | d3       | a          | b          | Auswerferstift<br>Spring ejector | Verdreh-<br>sicherung<br>Rotation<br>prevention | Material  | Beschich-<br>tung<br>Coating | Menge<br>Quantity |



|           |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------|--|--|--|--|--|--|--|--|--|--|--|--|--|
| <b>SE</b> |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <b>SE</b> |  |  |  |  |  |  |  |  |  |  |  |  |  |

[SE]



Date: \_\_\_\_\_

Punches  Inquiry  Order Die buttons  Inquiry  Order

Please copy form, fill out  
 and fax to MSPN  
 +49 2351 6610777

Company: \_\_\_\_\_

Street / number: \_\_\_\_\_

Postal code / city / country: \_\_\_\_\_

Contact: \_\_\_\_\_

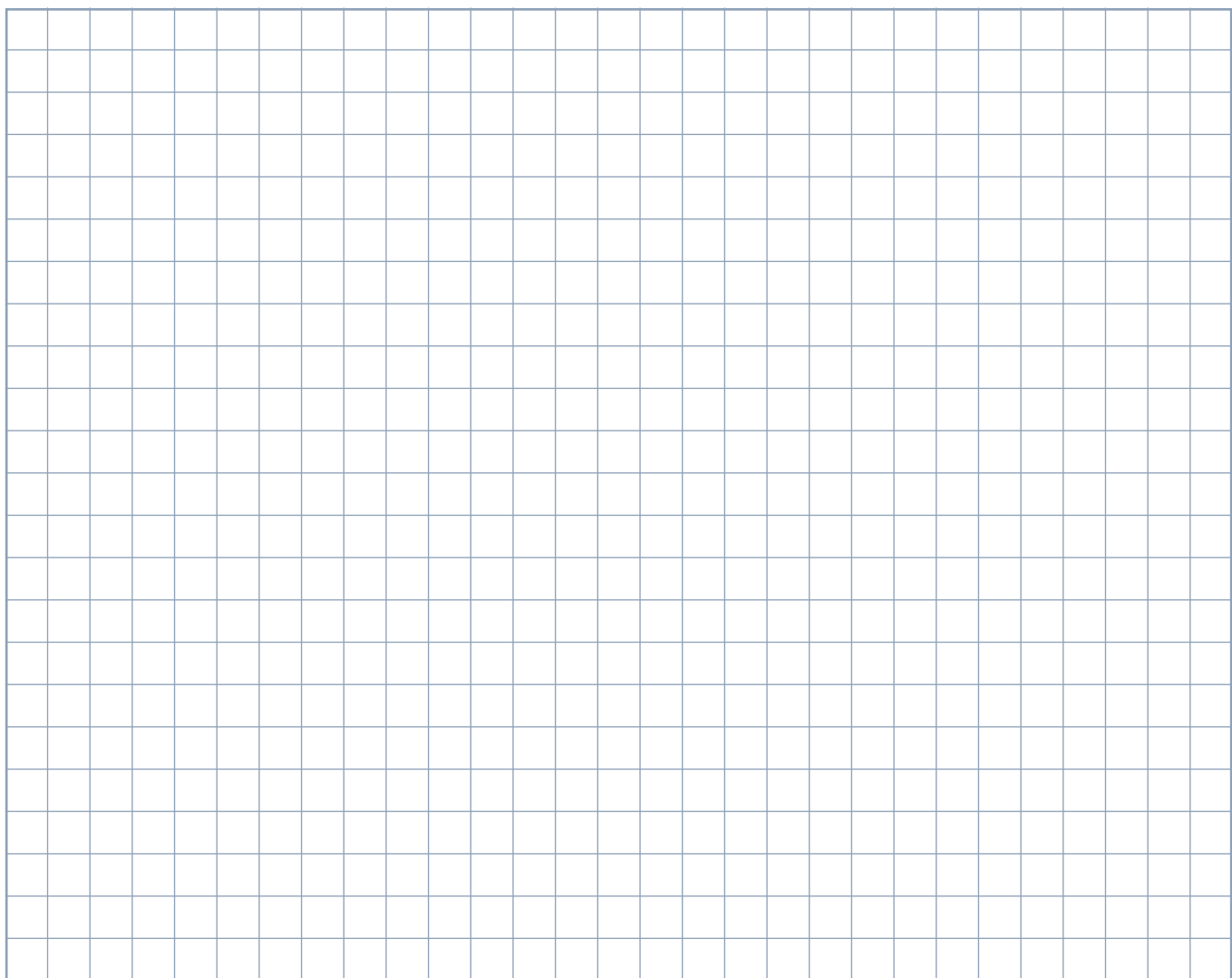
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Mail: \_\_\_\_\_

Inquiry-no. \_\_\_\_\_ Order-No. \_\_\_\_\_

Mat.: \_\_\_\_\_ Coating: \_\_\_\_\_

For special, custom made parts  
please provide drawing or CAD data! Quantity: \_\_\_\_\_



[SE]







**MSP** GN MBH


















**Märkische Stanz-Partner**





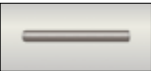




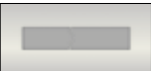
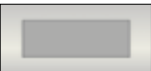
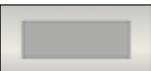
**[technische Hilfsmittel]**










**[general die components]**



|    | <b>Bohrbuchsen</b>  | <b>Drill bushings</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|---|---|--------------------------------|-----------------------|
|    | <u>Bohrbuchsen mit Bund DIN 172.<br/>Form A</u>                       | <u>Drill bushings with collar DIN 172.<br/>Form A</u>                       | TH 795                         | TH.2                  |
|    | <u>Bohrbuchsen ohne Bund DIN 179.<br/>Form A</u>                      | <u>Drill bushings without collar DIN 179.<br/>Form A</u>                    | TH 794                         | TH.1                  |
|    | <b>Befestigungselemente,<br/>Zentrierhilfen, etc.</b>                 | <b>Mounting accessories,<br/>locators, ejectors, etc.</b>                   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|    | <u>Auswerferstifte<br/>DIN 1530 Form D</u>                            | <u>Ejector pins<br/>DIN 1530 Form D</u>                                     | TH 751                         | TH.10                 |
|    | <u>Aufwerferstifte, gehärtet<br/>DIN 1530 A – ISO 6750</u>            | <u>Ejector pins, hardened<br/>DIN 1530 A – ISO 6750</u>                     | TH 750                         | TH.9                  |
|    | <u>Federnde Druckstücke mit Bolzen und<br/>Schlitz, Type B</u>        | <u>Spring plungers with round ended bolt<br/>and slot, Type B</u>           | TH 330                         | TH.13                 |
|   | <u>Federnde Druckstücke mit<br/>Innensechskant und Bolzen, Type A</u> | <u>Spring plungers with round ended bolt<br/>and hexagon socket, Type A</u> | TH 340                         | TH.14                 |
|  | <u>Federnde Druckstücke mit Kugel und<br/>Schlitz, Type K</u>         | <u>Spring plungers with ball and with slot,<br/>Type K</u>                  | TH 310                         | TH.11                 |
|  | <u>Federnde Druckstücke mit Kugel und<br/>Schlitz, Type KN</u>        | <u>Spring plungers with ball and with slot,<br/>Type KN</u>                 | TH 320                         | TH.12                 |
|  | <u>Federnde Druckstücke,<br/>lange Ausführung, Type L</u>             | <u>Spring plungers, long version, Type L</u>                                | TH 350                         | TH.15                 |
|  | <u>Gewindestifte mit Innensechskant<br/>DIN 913 / ISO 4026</u>        | <u>Hexagon socket set screws<br/>DIN 913 / ISO 4026</u>                     | TH 113                         | TH.8                  |
|  | <u>Handstempelgeräte, pneumatisch</u>                                 | <u>Manual stamping tool,<br/>pneumatic</u>                                  | TH 930<br>TH 931<br>TH 932     | TH.75<br>TH.76        |
|  | <u>Norm-Prägewerke</u>  | <u>Standard numbering heads</u>   | TH 936                         | TH.79                 |
|  | <u>Platinen-Einweiser</u>   | <u>Pilot gages</u>  | TH 900<br>TH 900 CH            | TH.41<br>TH.42        |
|  | <u>Platinen-Einweiser mit Teillagekontrolle</u>                       | <u>Pilot gages with part position control</u>                               | TH 901                         | TH.43                 |
|  | <u>Prägestempel-Einheit</u>   | <u>Date stamp units</u>   | TH 926<br>TH 927               | TH.73<br>TH.74        |
|  | <u>Prägewerke</u>   | <u>Numbering Heads</u>  | TH 933<br>TH 934<br>TH 935     | TH.77<br>TH.78        |
|  | <u>Schulterpasssschrauben</u>   | <u>Hexagon socket head shoulder screws</u>                                  | TH 413                         | TH.3                  |
|  | <u>Senkschrauben mit Innensechskant<br/>DIN 7991 / ISO 10642</u>      | <u>Countersunk head screws with hexagon<br/>socket DIN 7991 / ISO 10642</u> | TH 111                         | TH.5                  |












|   | <b>Befestigungselemente,<br/>Zentrierhilfen, etc.</b>              | <b>Mounting accessories,<br/>locators, ejectors, etc.</b>          | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|--|--|--------------------------------|-----------------------|
|  | <u>Zentrierbolzen</u>  | <u>Locating pins</u>   | TH 943<br>TH 944               | TH.45                 |
|  | <u>Zentriereinheiten mit Distanzscheibe</u>                        | <u>Tapered interlocks with spacer disk</u>                         | TH 920                         | TH.44                 |
|  | <u>Zylinderschrauben mit Innensechskant<br/>DIN 912 / ISO 4762</u> | <u>Hexagon socket head cap screws<br/>DIN 912 / ISO 4762</u>       | TH 110                         | TH.4                  |
|  | <u>Zylinderstifte DIN EN 28734<br/>Form A (DIN 6325)</u>           | <u>Dowel pins DIN EN 28734 Form A<br/>(DIN 6325)</u>               | TH 700                         | TH.6                  |
|  | <u>Zylinderstifte mit Innengewinde<br/>ähnlich DIN EN ISO 8375</u> | <u>Dowel pins with internal thread<br/>similar DIN EN ISO 8375</u> | TH 705                         | TH.7                  |

|     | <b>Lehrenbänder,<br/>Unterlagsfolien</b> | <b>Feeler gage stock and<br/>calibrated shimsteel</b> | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|--|---|--------------------------------|-----------------------|
|   | <u>Präzisions-Lehrenband</u>             | <u>Precision feeler gages steel</u>                   | TH 422, TH 423<br>TH 424       | TH.16 -<br>TH.18      |
|  | <u>Unterlagsfolien</u>                   | <u>Calibrated shimsteels</u>                          | TH 432<br>TH 433               | TH.19<br>TH.20        |
|  | <u>Unterlagsfolien im Sortiment</u>      | <u>Calibrated shimsteels, sorted</u>                  | TH 434                         | TH.21                 |

|   | <b>Tragelemente</b>  | <b>Lifting elements</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|--|---|--------------------------------|-----------------------|
|  | <u>Einspannzapfen mit Gewindenschaft<br/>ähnlich DIN 9859, Form CE</u> | <u>Shanks with screwed shaft,<br/>similar DIN 9859, Form CE</u> | TH 380                         | TH.22                 |
|  | <u>Lastböcke - drehbar, Standard/Vario</u>                             | <u>Hoist rings - rotatable; Standard / Vario</u>                | TH 56 R                        | TH.35                 |
|  | <u>Oberluftbolzen, VDI 3002</u>  | <u>Upper air pins, VDI 3002</u>                                 | TH 910                         | TH.29                 |
|  | <u>Ringmuttern, hochfest</u>   | <u>Lifting eye nuts, high-strength</u>                          | TH 58 R                        | TH.33                 |
|  | <u>Ringschrauben - drehbar, STAR POINT</u>                             | <u>Eyebolts - rotatable, STAR POINT</u>                         | TH 55 R                        | TH.34                 |
|  | <u>Ringschrauben, hochfest</u>   | <u>Eyebolts, high-strength</u>                                  | TH 57 R                        | TH.32                 |
|  | <u>Steckbolzen, Form 1, VDI 3366</u>                                   | <u>Pad retainer pins, Form 1, VDI 3366</u>                      | TH 911                         | TH.30                 |
|  | <u>Steckbolzen, Form 2, VDI 3366</u>                                   | <u>Pad retainer pins, Form 2, VDI 3366</u>                      | TH 912                         | TH.31                 |



|  | <b>Tragelemente</b>   | <b>Lifting elements</b>  | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|--|---|--|--------------------------------|-----------------------|
|  | <u>Tragbolzen mit Fallsicherung, VDI 3366</u>                 | <u>Lifting pins, VDI 3366</u>                                      | TH 250                         | TH.26                 |
|  | <u>Tragschrauben, VDI 3366</u>                                | <u>Lifting pins, VDI 3366</u>                                      | TH 230                         | TH.25                 |
|  | <u>Tragzapfen</u>   | <u>Lifting brackets</u>  | TH 220                         | TH.23                 |
|  | <u>Tragzapfen mit Seilsicherung, VDI 3366</u>                 | <u>Lifting brackets with rope stop safety, VDI 3366</u>            | TH 221                         | TH.24                 |
|  | <u>Unterluftbolzen</u>  | <u>Lower air pins</u>  | TH 908<br>TH 909               | TH.27<br>TH.28        |
|  | <u>Wirbelböcke - Gewinde</u>                                  | <u>Lifting points, threaded</u>                                    | TH 59 R                        | TH.37                 |
|  | <u>Wirbelböcke - Gewinde, Standard/Vario</u>                  | <u>Lifting points, threaded, Standard / Vario</u>                  | TH 54 R                        | TH.36                 |
|  | <u>Wirbelböcke mit Ösenhaken, doppelt - kugelgelagert</u>     | <u>Universal lifting points with eye hook, double ball bearing</u> | TH 53 R                        | TH.38                 |
|  | <u>Wirbelböcke mit Ovalglied für direkten Kettenanschluss</u> | <u>Lifting points with oval ring for direct chain connection</u>   | TH 60 R<br>TH 61 R             | TH.39<br>TH.40        |
|  | <b>Rollenschieber-Einheiten</b>                               | <b>Cam-units</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|  | <u>Rollenschieber-Einheiten</u>                               | <u>Cam-units</u>   | NCC....                        | TH.46<br>- 58         |
|  | <b>Teileförderer</b>  | <b>Part conveyors</b>  | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|  | <u>Teileförderer</u>  | <u>Part conveyors</u>  | NCV...                         | TH.59<br>- 72         |
|  | <u>Stützblock aus Teflon</u>                                  | <u>Support blocks, teflon</u>                                      | NCVA.4                         | TH.65                 |
|  | <u>Stützelemente</u>  | <u>Supports</u>  | NCVA....                       | TH.64                 |

|     | <b>Chemieprodukte</b>                               | <b>Chemical auxiliary products</b>                           | <b>Best.-Nr. Order no.</b> | <b>Seite Page</b> |
|---|---|--|----------------------------|-------------------|
|    | <u>Füge-Verbindungskleber</u>                       | <u>Adhesive</u>  | TH 017                     | TH.87             |
|    | <u>Hochtemperatur Trenn- und Gleitmittel mit Cu</u> | <u>High-temperature release- and antiseize-agent with Cu</u> | TH 015                     | TH.85             |
|    | <u>Kaltentfetter</u>                                | <u>Cold degreaser</u>  | TH 010                     | TH.80             |
|    | <u>Korrosionsschutz</u>                             | <u>Corrosion prevention</u>                                  | TH 012                     | TH.82             |
|    | <u>Leckspray für Fluide</u>                         | <u>Leakage spray for fluids</u>                              | TH 019                     | TH.89             |
|    | <u>Rostlöser</u>                                    | <u>Rust remover</u>  | TH 011                     | TH.81             |
|    | <u>Schmierstoffpaste</u>                            | <u>Lubrication paste</u>                                     | TH 014                     | TH.84             |
|  | <u>Schraubensicherung</u>                           | <u>Screw locking</u>   | TH 016                     | TH.86             |
|  | <u>Sekundenkleber</u>                               | <u>Instant adhesive</u>                                      | TH 018                     | TH.88             |
|  | <u>Sprühfett</u>                                    | <u>Spray grease</u>  | TH 013                     | TH.83             |

[TH]

# Bohrbuchsen ohne Bund DIN 179, Form A

## Drill bushings without collar DIN 179, Form A



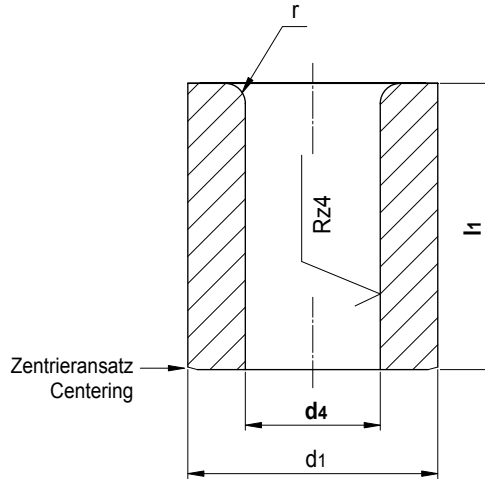
TECHNISCHE HILFSMITTEL / GENERAL DIE COMPONENTS

**TH 794**

Härte: 740 +80HV10

Hardness: 740 +80HV10

TH 794 / 8,1 x 12



| d4<br>F7    | Stufung<br>Graduation | l1<br>kurz / short | l1<br>mittel / medium | d1<br>n6 | r   |
|-------------|-----------------------|--------------------|-----------------------|----------|-----|
| -1          | 0,1/0,25              | 6                  | 9                     | 3        | 1,0 |
| 1,1 - 1,8   | 0,1/0,25              | 6                  | 9                     | 4        | 1,0 |
| 1,9 - 2,6   | 0,1/0,25              | 6                  | 9                     | 5        | 1,0 |
| 2,7 - 3,3   | 0,1/0,25              | 8                  | 12                    | 6        | 1,0 |
| 3,4 - 4,0   | 0,1/0,25              | 8                  | 12                    | 7        | 1,0 |
| 4,1 - 5,0   | 0,1/0,25              | 8                  | 12                    | 8        | 1,0 |
| 5,1 - 6,0   | 0,1/0,25              | 10                 | 16                    | 10       | 1,5 |
| 6,1 - 8,0   | 0,1/0,25              | 10                 | 16                    | 12       | 1,5 |
| 8,1 - 10,0  | 0,1/0,25              | 12                 | 20                    | 15       | 2,0 |
| 10,1 - 12,0 | 0,1/0,25              | 12                 | 20                    | 18       | 2,0 |
| 12,1 - 15,0 | 0,1/0,25              | 16                 | 28                    | 22       | 2,0 |
| 15,5 - 18,0 | 0,5                   | 16                 | 28                    | 26       | 2,0 |
| 18,5 - 22,0 | 0,5                   | 20                 | 36                    | 30       | 3,0 |
| 22,5 - 26,0 | 0,5                   | 20                 | 36                    | 35       | 3,0 |
| 26,5 - 30,0 | 0,5                   | 25                 | 45                    | 42       | 3,0 |

[TH]

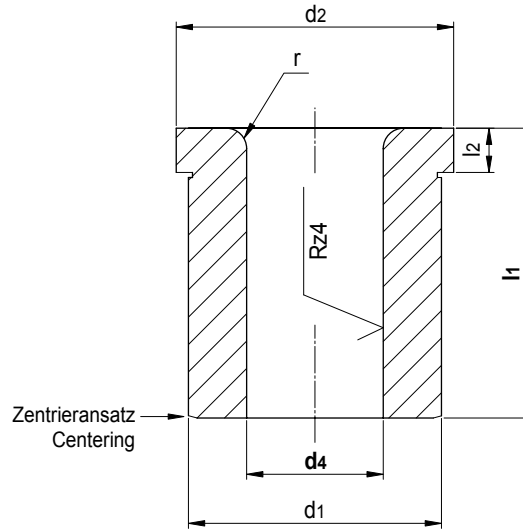


**TH 795**

Härte: 740 +80HV10

Hardness: 740 +80HV10

 **TH 795 / 8,1 x 12**



| d4<br>F7    | Stufung<br>Graduation | l1<br>kurz / short | l1<br>mittel / medium | l2  | d1<br>n6 | d2 | r   |
|-------------|-----------------------|--------------------|-----------------------|-----|----------|----|-----|
| -1          | 0,1/0,25              | 6                  | 9                     | 2,0 | 3        | 6  | 1,0 |
| 1,1 - 1,8   | 0,1/0,25              | 6                  | 9                     | 2,0 | 4        | 7  | 1,0 |
| 1,9 - 2,6   | 0,1/0,25              | 6                  | 9                     | 2,0 | 5        | 8  | 1,0 |
| 2,7 - 3,3   | 0,1/0,25              | 8                  | 12                    | 2,5 | 6        | 9  | 1,0 |
| 3,4 - 4,0   | 0,1/0,25              | 8                  | 12                    | 2,5 | 7        | 10 | 1,0 |
| 4,1 - 5,0   | 0,1/0,25              | 8                  | 12                    | 2,5 | 8        | 11 | 1,0 |
| 5,1 - 6,0   | 0,1/0,25              | 10                 | 16                    | 3,0 | 10       | 13 | 1,5 |
| 6,1 - 8,0   | 0,1/0,25              | 10                 | 16                    | 3,0 | 12       | 15 | 1,5 |
| 8,1 - 10,0  | 0,1/0,25              | 12                 | 20                    | 3,0 | 15       | 18 | 2,0 |
| 10,1 - 12,0 | 0,1/0,25              | 12                 | 20                    | 4,0 | 18       | 22 | 2,0 |
| 12,1 - 15,0 | 0,1/0,25              | 16                 | 28                    | 4,0 | 22       | 26 | 2,0 |
| 15,5 - 18,0 | 0,5                   | 16                 | 28                    | 4,0 | 26       | 30 | 2,0 |
| 18,5 - 22,0 | 0,5                   | 20                 | 36                    | 5,0 | 30       | 34 | 3,0 |
| 22,5 - 26,0 | 0,5                   | 20                 | 36                    | 5,0 | 35       | 39 | 3,0 |
| 26,5 - 30,0 | 0,5                   | 25                 | 45                    | 5,0 | 42       | 46 | 3,0 |

[TH]



# Schulterpassschrauben

## Hexagon socket head shoulder screws



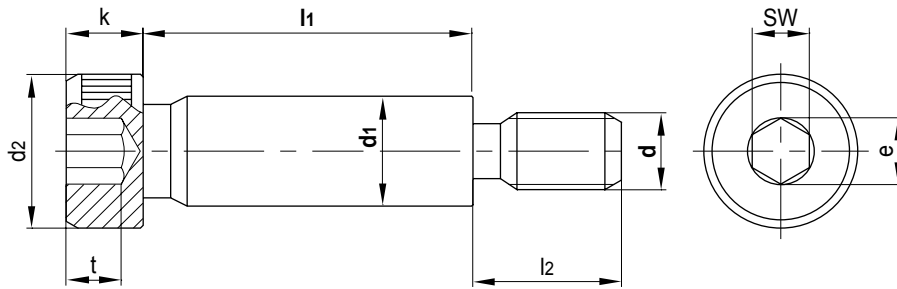
TECHNISCHE HILFSMITTEL / GENERAL DIE COMPONENTS

### TH 413

Mat.: Einsatzstahl  
Festigkeitsklasse 12.9

Mat.: case-hardened steel  
Property class 12.9

TH 413 /  
10 x M8 x 40



| d1<br>h8 | d   | l2   | d2 | k    | t    | e    | SW | l1 |    |    |    |    |    |    |    |    |    |    |    |    |     |     |   |   |   |
|----------|-----|------|----|------|------|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|---|---|---|
|          |     |      |    |      |      |      |    | 10 | 16 | 20 | 25 | 30 | 40 | 50 | 55 | 60 | 65 | 70 | 80 | 90 | 100 | 120 |   |   |   |
| 6        | M5  | 9,5  | 10 | 4,5  | 2,4  | 3,6  | 3  | •  | •  | •  | •  | •  | •  | •  | •  | •  |    |    |    |    |     |     |   |   |   |
| 8        | M6  | 11,0 | 13 | 5,5  | 3,3  | 4,7  | 4  |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   | •   | • |   |   |
| 10       | M8  | 13,0 | 16 | 7,0  | 4,1  | 5,9  | 5  |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   | •   | • | • |   |
| 12       | M10 | 16,0 | 18 | 9,0  | 4,9  | 7,0  | 6  |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   | •   | • | • | • |
| 16       | M12 | 18,0 | 24 | 11,0 | 6,2  | 9,4  | 8  |    |    |    |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   | •   | • | • | • |
| 20       | M16 | 22,0 | 30 | 14,0 | 8,8  | 11,7 | 10 |    |    |    |    |    |    | •  | •  | •  | •  | •  | •  | •  | •   | •   | • | • | • |
| 24       | M20 | 27,0 | 36 | 16,0 | 10,0 | 14,0 | 12 |    |    |    |    |    |    |    | •  |    |    | •  | •  | •  | •   | •   | • | • | • |

[TH]

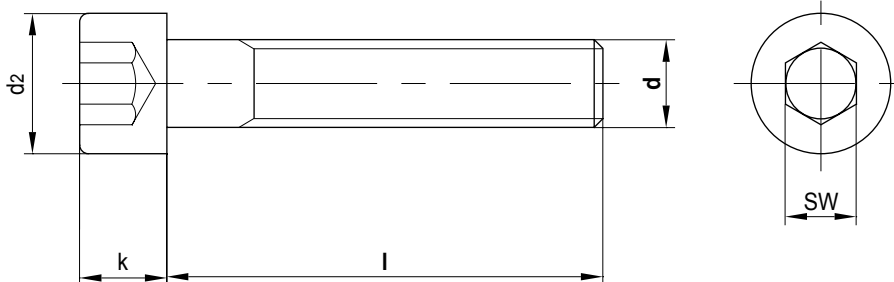


TH 110

Mat.: Einsatzstahl  
Festigkeitsklasse 10.9

Mat.: case-hardened steel  
Property class 10.9

TH 110 / M12 x 60



[TH]

| d   | d2   | k  | SW   | l  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |   |   |   |  |
|-----|------|----|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|---|--|
|     |      |    |      | 10 | 12 | 16 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 240 |   |   |   |  |
| M3  | 5,5  | 3  | 2,5  | •  | •  | •  | •  | •  |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |   |   |   |  |
| M4  | 7,0  | 4  | 3,0  | •  | •  | •  | •  | •  |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |   |   |   |  |
| M5  | 8,5  | 5  | 4,0  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |    |    |    |    |    |    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |   |   |   |  |
| M6  | 10,0 | 6  | 5,0  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |    | •  | •  | •  |     | •   |     |     |     |     |     |     |     |     |     |     |     |     |   |   |   |  |
| M8  | 13,0 | 8  | 6,0  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |    | •  | •  | •  | •   | •   | •   | •   | •   |     |     |     |     |     |     |     |     |     |   |   |   |  |
| M10 | 16,0 | 10 | 8,0  | •  |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |    | •  | •  | •  | •   | •   | •   | •   | •   | •   | •   |     | •   |     | •   |     |     |     |   |   |   |  |
| M12 | 18,0 | 12 | 10,0 |    |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   |     | •   | •   | •   | •   | • | • |   |  |
| M16 | 24,0 | 16 | 14,0 |    |    |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   | •   |     | •   | •   | • | • | • |  |
| M20 | 30,0 | 20 | 17,0 |    |    |    |    |    |    | •  |    | •  |    | •  |    | •  |    | •  |    | •  |     | •   |     | •   |     | •   |     | •   |     | •   |     | •   |     | •   |   | • |   |  |

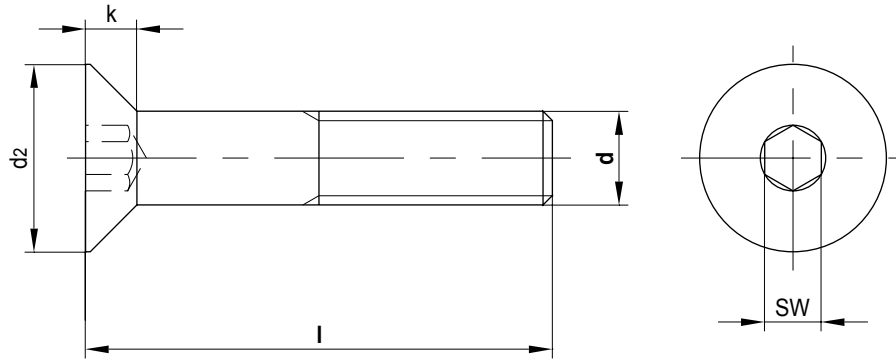


**TH 111**

Mat.: Einsatzstahl  
Festigkeitsklasse 8.8

Mat.: case-hardened steel  
Property class 8.8

**TH 111 / M8 x 20**



| d   | d2 | k   | SW  | l  |    |    |    |    |    |    |    |   |
|-----|----|-----|-----|----|----|----|----|----|----|----|----|---|
|     |    |     |     | 10 | 12 | 16 | 20 | 25 | 30 | 35 | 40 |   |
| M3  | 6  | 1,7 | 2,0 | •  | •  | •  | •  | •  | •  | •  | •  | • |
| M4  | 8  | 2,3 | 2,5 | •  | •  | •  | •  | •  | •  | •  | •  | • |
| M5  | 10 | 2,8 | 3,0 | •  | •  | •  | •  | •  | •  | •  | •  | • |
| M6  | 12 | 3,3 | 4,0 | •  | •  | •  | •  | •  | •  | •  | •  | • |
| M8  | 16 | 4,4 | 5,0 | •  | •  | •  | •  | •  | •  | •  | •  | • |
| M10 | 20 | 5,5 | 6,0 | •  | •  | •  | •  | •  | •  | •  | •  | • |

[TH]

# Zylinderstifte, DIN EN 28734 Form A (DIN 6325)



## Dowel pins, DIN EN 28734 Form A (DIN 6325)

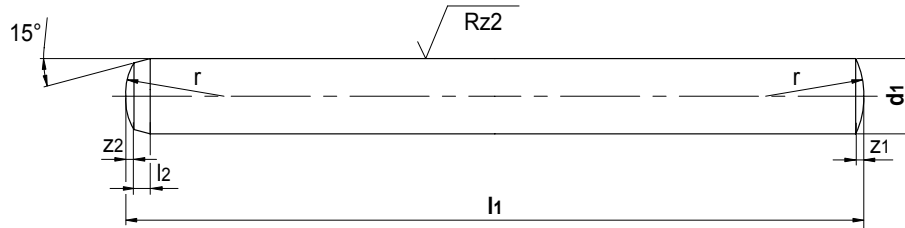
TECHNISCHE HILFSMITTEL / GENERAL DIE COMPONENTS

### TH 700

Mat.: Einsatzstahl  
Härte: 60 ±2 HRC

Mat.: case-hardened steel  
Hardness: 60 ±2 HRC

TH 700 / 5,0 x 12



| d1   | l2  | r    | z1   | z2   | l1 |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
|------|-----|------|------|------|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| m5   |     |      |      |      | 4  | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 28 | 32 | 36 | 40 | 45 | 50 | 55 | 60 | 70 | 80 | 90 | 100 |
| 1,5  | 0,5 | 1,6  | 0,23 | 0,12 | •  | • | • | • | •  | •  | •  | •  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |
| 2,0  | 0,6 | 2,0  | 0,30 | 0,18 |    |   | • | • | •  | •  | •  | •  | •  | •  |    |    |    |    |    |    |    |    |    |    |    |    |     |
| 2,5  | 0,7 | 2,5  | 0,40 | 0,25 |    |   | • | • | •  | •  | •  | •  | •  | •  | •  |    |    |    |    |    |    |    |    |    |    |    |     |
| 3,0  | 0,8 | 3,0  | 0,45 | 0,30 |    |   |   | • | •  | •  | •  | •  | •  | •  | •  | •  | •  |    |    |    |    |    |    |    |    |    |     |
| 4,0  | 1,0 | 4,0  | 0,60 | 0,40 |    |   |   |   | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |    |    |    |    |    |    |    |     |
| 5,0  | 1,2 | 5,0  | 0,75 | 0,50 |    |   |   |   |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |    |    |    |    |    |    |     |
| 6,0  | 1,5 | 6,0  | 0,90 | 0,60 |    |   |   |   |    |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |    |    |    |    |    |     |
| 8,0  | 1,8 | 8,0  | 1,20 | 0,80 |    |   |   |   |    |    |    |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  |    |    | •  | •  |     |
| 10,0 | 2,0 | 10,0 | 1,50 | 1,00 |    |   |   |   |    |    |    |    |    |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   |
| 12,0 | 2,5 | 12,0 | 1,80 | 1,30 |    |   |   |   |    |    |    |    |    |    |    |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   |

[TH]





# Zylinderstifte mit Innengewinde, ähnlich DIN EN ISO 8375

## Dowel pins with internal thread, similar DIN EN ISO 8375



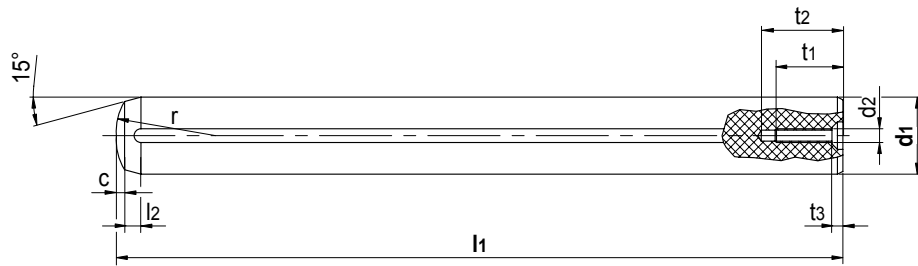
TECHNISCHE HILFSMITTEL / GENERAL DIE COMPONENTS

### TH 705

Mat.: Einsatzstahl  
Härte: 60 ±2 HRc

Mat.: case-hardened steel  
Hardness: 60 ±2 HRc

TH 705 / 10 x 80



| d1<br>m6 | l2  | r  | c   | d2  | t1 | t2 | t3  | l1 |    |    |    |    |    |    |    |    |    |    |    |
|----------|-----|----|-----|-----|----|----|-----|----|----|----|----|----|----|----|----|----|----|----|----|
|          |     |    |     |     |    |    |     | 20 | 24 | 28 | 32 | 36 | 40 | 45 | 50 | 60 | 70 | 80 | 90 |
| 6        | 1,5 | 6  | 0,6 | M4  | 6  | 10 | 1,0 | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |    |    |    |
| 8        | 1,8 | 8  | 0,8 | M5  | 8  | 13 | 1,2 | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |    |
| 10       | 2,0 | 10 | 1,0 | M6  | 10 | 16 | 1,2 |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |    |    |
| 12       | 2,5 | 12 | 1,3 | M6  | 12 | 18 | 1,2 |    |    |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |
| 14       | 2,5 | 14 | 1,3 | M8  | 12 | 18 | 1,2 |    |    |    | ●  | ●  | ●  | ●  | ●  |    | ●  |    | ●  |
| 16       | 3,0 | 16 | 1,7 | M8  | 16 | 23 | 1,6 |    |    |    |    | ●  | ●  | ●  | ●  |    | ●  |    | ●  |
| 20       | 4,0 | 20 | 2,0 | M10 | 20 | 27 | 1,6 |    |    |    |    |    |    | ●  | ●  |    | ●  |    | ●  |

[TH]

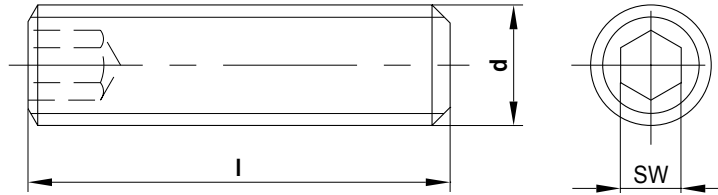


TH 113

Mat.: Einsatzstahl  
Festigkeitsklasse 45H

Mat.: case-hardened steel  
Property class 45H

TH 113 / M3 x 5



| d   | SW  | l |   |   |    |    |    |    |    |    |    |    |    |
|-----|-----|---|---|---|----|----|----|----|----|----|----|----|----|
|     |     | 5 | 6 | 8 | 10 | 12 | 16 | 20 | 25 | 30 | 35 | 40 | 50 |
| M3  | 1,5 | • | • | • | •  |    | •  |    |    |    |    |    |    |
| M4  | 2,0 | • | • | • | •  | •  | •  | •  |    |    |    |    |    |
| M5  | 2,5 | • | • | • | •  | •  | •  | •  | •  |    |    |    |    |
| M6  | 3,0 |   | • | • | •  | •  | •  | •  | •  | •  |    | •  |    |
| M8  | 4,0 |   |   | • | •  | •  | •  | •  | •  | •  |    |    |    |
| M10 | 5,0 |   |   |   | •  | •  | •  | •  | •  | •  | •  | •  | •  |
| M12 | 6,0 |   |   |   |    | •  | •  | •  | •  | •  | •  | •  | •  |
| M16 | 8,0 |   |   |   |    |    | •  | •  | •  | •  | •  | •  | •  |


[TH]

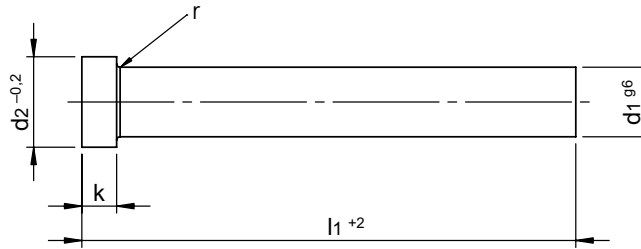


**TH 750**

Mat.: WS - legierter Werkzeugstahl  
Härte Schaft: 62 –2 HRC  
Kopf: 45 ±5 HRC  
Schaft feinstgeschliffen  
Kopf warmgestaucht

Mat.: WS - alloyed tool steel  
Hardness shaft: 62 –2 HRC  
Head: 45 ±5 HRC  
Shaft finish ground  
Head warm-upset

 **TH 750 / 4 x 100**




| d1 | d2   | k | r   | l1 +2 |     |
|----|------|---|-----|-------|-----|
|    |      |   |     | 100   | 160 |
| g6 | -0.2 |   |     |       |     |
| 2  | 4    | 2 | 0,2 | ●     | ●   |
| 3  | 6    | 3 | 0,3 | ●     | ●   |
| 4  | 8    | 3 | 0,3 | ●     | ●   |
| 5  | 10   | 3 | 0,3 | ●     | ●   |
| 6  | 12   | 5 | 0,5 | ●     | ●   |
| 7  | 12   | 5 | 0,5 | ●     | ●   |
| 8  | 14   | 5 | 0,5 | ●     | ●   |
| 9  | 14   | 5 | 0,5 | ●     | ●   |
| 10 | 16   | 5 | 0,5 | ●     | ●   |
| 12 | 18   | 7 | 0,8 | ●     | ●   |
| 14 | 22   | 7 | 0,8 | ●     | ●   |
| 16 | 22   | 7 | 0,8 | ●     | ●   |

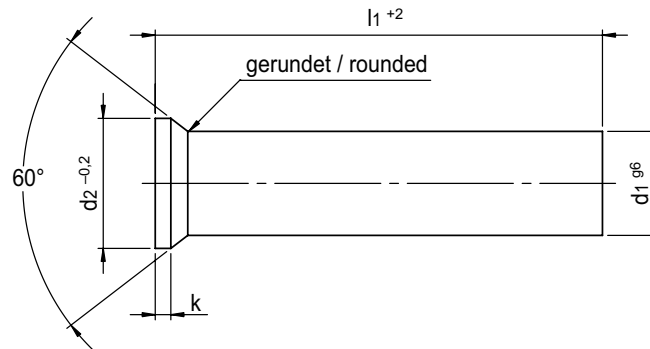
[TH]

**TH 751**

Mat.: WS - legierter Werkzeugstahl  
Härte Schaft: 62 –2 HRC  
Kopf: 45 ±5 HRC  
Schaft feinstgeschliffen  
Kopf warmgestaucht

Mat.: WS - alloyed tool steel  
Hardness shaft: 62 –2 HRC  
Head: 45 ±5 HRC  
Shaft finish ground  
Head warm-upset

 **TH 751 / 10,0 x 160**



| d1<br>g6 | d2<br>-0,02 | k   | l1 +2 |     |
|----------|-------------|-----|-------|-----|
|          |             |     | 100   | 160 |
| 2,0      | 3,0         | 0,5 | •     | •   |
| 2,5      | 3,5         | 0,5 | •     | •   |
| 3,0      | 4,5         | 0,5 | •     | •   |
| 3,5      | 5,0         | 0,5 | •     | •   |
| 4,0      | 5,5         | 0,5 | •     | •   |
| 4,5      | 6,0         | 0,5 | •     | •   |
| 5,0      | 6,5         | 0,5 | •     | •   |
| 5,5      | 7,0         | 0,5 | •     | •   |
| 6,0      | 8,0         | 0,5 | •     | •   |
| 6,5      | 9,0         | 1,0 | •     | •   |
| 7,0      | 9,0         | 1,0 | •     | •   |
| 8,0      | 10,0        | 1,0 | •     | •   |
| 8,5      | 11,0        | 1,0 | •     | •   |
| 9,0      | 11,0        | 1,0 | •     | •   |
| 10,0     | 12,0        | 1,0 | •     | •   |
| 12,0     | 14,0        | 1,0 | •     | •   |
| 14,0     | 16,0        | 1,5 | •     | •   |
| 16,0     | 18,0        | 1,5 | •     | •   |

[TH]

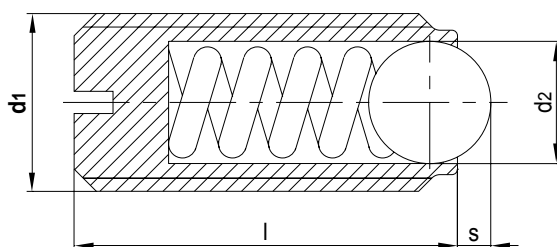


**TH 310**

Mat.: Automatenstahl

Mat.: Free cutting steel

 **TH 310 / M4**



| d1         | l  | s   | d2   | F1<br>N | Fmax.<br>N |
|------------|----|-----|------|---------|------------|
| <b>M4</b>  | 9  | 0,8 | 2,5  | 8,5     | 14         |
| <b>M5</b>  | 12 | 0,9 | 3,0  | 8,0     | 14         |
| <b>M6</b>  | 14 | 1,0 | 3,5  | 11,0    | 18         |
| <b>M8</b>  | 16 | 1,5 | 5,0  | 18,0    | 31         |
| <b>M10</b> | 19 | 2,0 | 6,0  | 24,0    | 45         |
| <b>M12</b> | 22 | 2,5 | 8,0  | 26,0    | 49         |
| <b>M16</b> | 24 | 3,5 | 10,0 | 41,0    | 86         |

[TH]

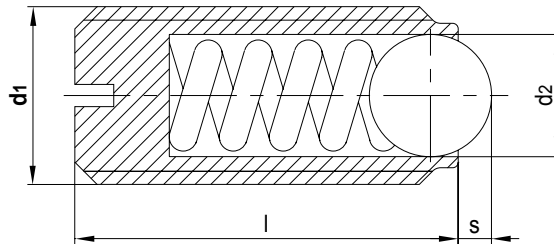


TH 320

Mat.: nichtrostender Stahl  
Hitzebeständigkeit bis 250 °C

Mat.: stainless steel  
Heat resistant up to 250 °C

TH 320 / M4



| d1  | l  | s   | d2   | F1<br>N | Fmax.<br>N |
|-----|----|-----|------|---------|------------|
| M4  | 9  | 0,8 | 2,5  | 8,5     | 14         |
| M5  | 12 | 0,9 | 3,0  | 8,0     | 14         |
| M6  | 14 | 1,0 | 3,5  | 11,0    | 18         |
| M8  | 16 | 1,5 | 5,0  | 18,0    | 31         |
| M10 | 19 | 2,0 | 6,0  | 24,0    | 45         |
| M12 | 22 | 2,5 | 8,0  | 26,0    | 49         |
| M16 | 24 | 3,5 | 10,0 | 41,0    | 86         |

[TH]



# Federnde Druckstücke mit Bolzen und Schlitz, Type B

## Spring plungers with round ended bolt and slot, Type B



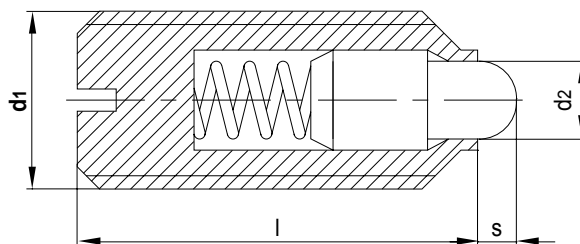
TECHNISCHE HILFSMITTEL / GENERAL DIE COMPONENTS

**TH 330**

Mat.: Automatenstahl

Mat.: Free cutting steel

 **TH 330 / M8**



| d1  | l  | s   | d2  | F1<br>N | Fmax.<br>N |
|-----|----|-----|-----|---------|------------|
| M8  | 16 | 2,0 | 4,0 | 16      | 33         |
| M10 | 19 | 2,5 | 4,5 | 19      | 42         |
| M12 | 22 | 3,5 | 6,0 | 22      | 57         |
| M16 | 24 | 4,5 | 8,5 | 38      | 78         |

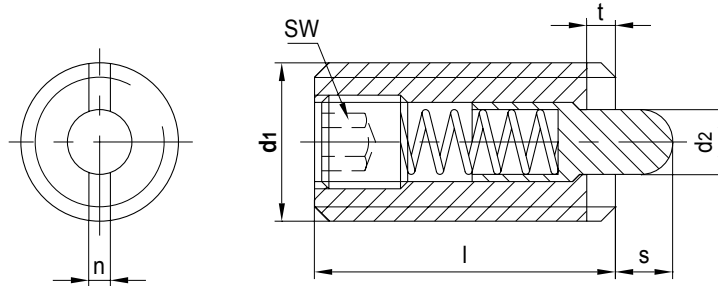
[TH]

TH 340

Mat.: Automatenstahl

Mat.: Free cutting steel

TH 340 / M4



| d1  | l  | s   | d2  | n   | t   | SW  | F1<br>N | Fmax.<br>N |
|-----|----|-----|-----|-----|-----|-----|---------|------------|
| M4  | 15 | 1,5 | 1,5 | 0,6 | 0,6 | 1,3 | 4,5     | 16         |
| M5  | 18 | 2,3 | 2,4 | 1,2 | 0,8 | 1,5 | 6,0     | 19         |
| M6  | 20 | 2,5 | 2,7 | 1,3 | 0,9 | 2,0 | 6,0     | 19         |
| M8  | 22 | 3,0 | 3,5 | 1,5 | 1,4 | 2,5 | 10,0    | 39         |
| M10 | 22 | 3,0 | 4,0 | 1,5 | 1,4 | 3,0 | 10,0    | 39         |
| M12 | 28 | 4,0 | 6,0 | 2,7 | 2,0 | 4,0 | 12,0    | 53         |
| M16 | 32 | 5,0 | 7,5 | 3,2 | 2,5 | 5,0 | 45,0    | 100        |

[TH]



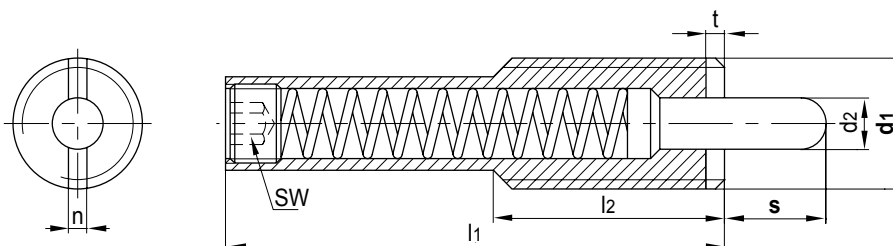


TH 350

Mat.: Automatenstahl

Mat.: Free cutting steel

TH 350 / M16 x 30



| d1  | d2  | l1  | l2 | s  | n   | t   | SW | F1<br>N | Fmax.<br>N |
|-----|-----|-----|----|----|-----|-----|----|---------|------------|
| M12 | 5,5 | 43  | 35 | 10 | 2,7 | 2,0 | 4  | 4       | 18         |
| M16 | 7,5 | 60  | 35 | 15 | 3,2 | 2,5 | 5  | 7       | 24         |
| M16 | 7,5 | 120 | 35 | 30 | 3,2 | 2,5 | 5  | 15      | 42         |

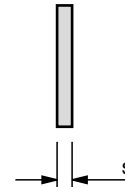
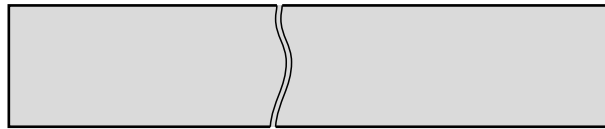
[TH]

**TH 422**

Mat.: 1.1274  
 Länge: 1000 mm  
 Breite: 12,7 mm  
 Packungseinheit: Rolle

Mat.: 1.1274  
 Length: 1000 mm  
 Width: 12,7 mm  
 Packaging unit: Roll

**TH 422 / 0,01**



| s           | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|-------------|---|
| 0,01 ±0,002 | 2000-2200   |
| 0,02 ±0,002 | 2000-2200   |
| 0,03 ±0,002 | 2000-2200   |
| 0,04 ±0,003 | 2000-2200   |
| 0,05 ±0,003 | 2000-2200   |
| 0,06 ±0,003 | 2000-2200   |
| 0,07 ±0,004 | 2000-2200   |
| 0,08 ±0,004 | 2000-2200   |
| 0,09 ±0,004 | 2000-2200   |
| 0,10 ±0,004 | 2000-2200   |
| 0,12 ±0,004 | 2000-2200   |
| 0,15 ±0,005 | 2000-2200   |
| 0,18 ±0,005 | 2000-2200   |
| 0,20 ±0,006 | 1800-2000   |
| 0,25 ±0,007 | 1800-2000   |
| 0,30 ±0,007 | 1800-2000   |
| 0,35 ±0,008 | 1800-2000   |
| 0,40 ±0,009 | 1600-1800   |
| 0,45 ±0,009 | 1600-1800   |
| 0,50 ±0,010 | 1600-1800   |


| s           | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|-------------|---|
| 0,55 ±0,010 | 1600-1800   |
| 0,60 ±0,010 | 1600-1800   |
| 0,65 ±0,012 | 1400-1600   |
| 0,70 ±0,012 | 1400-1600   |
| 0,75 ±0,012 | 1400-1600   |
| 0,80 ±0,013 | 1400-1600   |
| 0,85 ±0,013 | 1400-1600   |
| 0,90 ±0,013 | 1400-1600   |
| 0,95 ±0,013 | 1400-1600   |
| 1,00 ±0,013 | 1400-1600   |
| 1,10 ±0,017 | 1400-1600   |
| 1,20 ±0,017 | 1400-1600   |
| 1,30 ±0,020 | 1400-1600   |
| 1,40 ±0,020 | 1400-1600   |
| 1,50 ±0,020 | 1400-1600   |
| 1,60 ±0,023 | 1400-1600   |
| 1,70 ±0,023 | 1400-1600   |
| 1,80 ±0,023 | 1400-1600   |
| 1,90 ±0,023 | 1400-1600   |
| 2,00 ±0,035 | 1400-1600   |

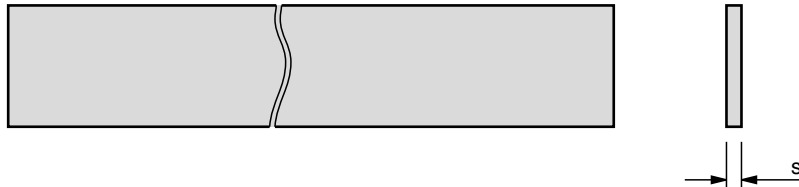


**TH 423**

Mat.: 1.1274  
Länge: 5000 mm  
Breite: 12,7 mm  
Packungseinheit: Rolle

Mat.: 1.1274  
Length: 5000 mm  
Width: 12,7 mm  
Packaging unit: Roll

 **TH 423 / 0,01**



| s           | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|-------------|---|
| 0,01 ±0,002 | 2000-2200   |
| 0,02 ±0,002 | 2000-2200   |
| 0,03 ±0,002 | 2000-2200   |
| 0,04 ±0,003 | 2000-2200   |
| 0,05 ±0,003 | 2000-2200   |
| 0,06 ±0,003 | 2000-2200   |
| 0,07 ±0,004 | 2000-2200   |
| 0,08 ±0,004 | 2000-2200   |
| 0,09 ±0,004 | 2000-2200   |
| 0,10 ±0,004 | 2000-2200   |
| 0,12 ±0,004 | 2000-2200   |
| 0,15 ±0,005 | 2000-2200   |
| 0,18 ±0,005 | 2000-2200   |
| 0,20 ±0,006 | 1800-2000   |
| 0,25 ±0,007 | 1800-2000   |
| 0,30 ±0,007 | 1800-2000   |
| 0,35 ±0,008 | 1800-2000   |
| 0,40 ±0,009 | 1600-1800   |
| 0,45 ±0,009 | 1600-1800   |
| 0,50 ±0,010 | 1600-1800   |

| s           | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|-------------|---|
| 0,55 ±0,010 | 1600-1800   |
| 0,60 ±0,010 | 1600-1800   |
| 0,65 ±0,012 | 1400-1600   |
| 0,70 ±0,012 | 1400-1600   |
| 0,75 ±0,012 | 1400-1600   |
| 0,80 ±0,013 | 1400-1600   |
| 0,85 ±0,013 | 1400-1600   |
| 0,90 ±0,013 | 1400-1600   |
| 0,95 ±0,013 | 1400-1600   |
| 1,00 ±0,013 | 1400-1600   |
| 1,10 ±0,017 | 1400-1600   |
| 1,20 ±0,017 | 1400-1600   |
| 1,30 ±0,020 | 1400-1600   |
| 1,40 ±0,020 | 1400-1600   |
| 1,50 ±0,020 | 1400-1600   |
| 1,60 ±0,023 | 1400-1600   |
| 1,70 ±0,023 | 1400-1600   |
| 1,80 ±0,023 | 1400-1600   |
| 1,90 ±0,023 | 1400-1600   |
| 2,00 ±0,035 | 1400-1600   |

[TH]

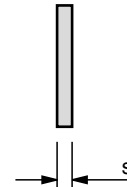
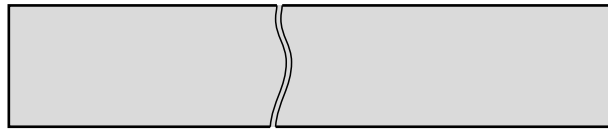


**TH 424**

Mat.: 1.1274  
 Länge: 5000 mm  
 Breite: 50,0 mm  
 Packungseinheit: Rolle

Mat.: 1.1274  
 Length: 5000 mm  
 Width: 50,0 mm  
 Packaging unit: Roll

**TH 424 / 0,03**



| s                  | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|--------------------|---|
| <b>0,03</b> ±0,002 | 2000-2200   |
| <b>0,04</b> ±0,003 | 2000-2200   |
| <b>0,05</b> ±0,003 | 2000-2200   |
| <b>0,06</b> ±0,003 | 2000-2200   |
| <b>0,07</b> ±0,004 | 2000-2200   |
| <b>0,08</b> ±0,004 | 2000-2200   |
| <b>0,09</b> ±0,004 | 2000-2200   |
| <b>0,10</b> ±0,004 | 2000-2200   |
| <b>0,12</b> ±0,004 | 2000-2200   |
| <b>0,15</b> ±0,005 | 2000-2200   |
| <b>0,18</b> ±0,005 | 2000-2200   |
| <b>0,20</b> ±0,006 | 1800-2000   |

| s                  | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|--------------------|---|
| <b>0,25</b> ±0,007 | 1800-2000   |
| <b>0,30</b> ±0,007 | 1800-2000   |
| <b>0,35</b> ±0,008 | 1800-2000   |
| <b>0,40</b> ±0,009 | 1600-1800   |
| <b>0,45</b> ±0,009 | 1600-1800   |
| <b>0,50</b> ±0,010 | 1600-1800   |
| <b>0,60</b> ±0,010 | 1600-1800   |
| <b>0,70</b> ±0,012 | 1400-1600   |
| <b>0,80</b> ±0,013 | 1400-1600   |
| <b>0,90</b> ±0,013 | 1400-1600   |
| <b>1,00</b> ±0,013 | 1400-1600   |


[TH]

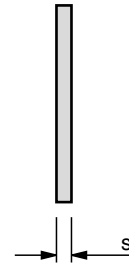


TH 432

Mat.: 1.1274  
Länge: 300 mm  
Breite: 50,0 mm  
Packungseinheit: 10 Stück

Mat.: 1.1274  
Length: 300 mm  
Width: 50,0 mm  
Packaging unit: 10 pieces

 TH 432 / 0,03



| s           | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|-------------|---|
| 0,01 ±0,002 | 2000-2200   |
| 0,02 ±0,002 | 2000-2200   |
| 0,03 ±0,002 | 2000-2200   |
| 0,04 ±0,003 | 2000-2200   |
| 0,05 ±0,003 | 2000-2200   |
| 0,06 ±0,003 | 2000-2200   |
| 0,07 ±0,004 | 2000-2200   |
| 0,08 ±0,004 | 2000-2200   |
| 0,09 ±0,004 | 2000-2200   |
| 0,10 ±0,004 | 2000-2200   |
| 0,15 ±0,005 | 2000-2200   |
| 0,20 ±0,006 | 1800-2000   |

| s           | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|-------------|---|
| 0,25 ±0,007 | 1800-2000   |
| 0,30 ±0,007 | 1800-2000   |
| 0,40 ±0,009 | 1600-1800   |
| 0,50 ±0,010 | 1600-1800   |
| 0,60 ±0,010 | 1600-1800   |
| 0,70 ±0,012 | 1400-1600   |
| 0,80 ±0,013 | 1400-1600   |
| 0,90 ±0,013 | 1400-1600   |
| 1,00 ±0,013 | 1400-1600   |
|             |   |
|             |   |
|             |   |

[TH]

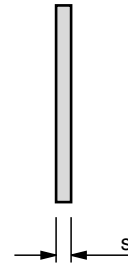


**TH 433**

Mat.: 1.4310  
 Länge: 500 mm  
 Breite: 100 mm  
 Packungseinheit: 5 Stück

Mat.: 1.4310  
 Length: 500 mm  
 Width: 100 mm  
 Packaging unit: 5 pieces

**TH 433 / 0,02**



| s                  | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|--------------------|---|
| <b>0,02</b> ±0,002 | 2000-2200   |
| <b>0,05</b> ±0,003 | 1850-2100   |
| <b>0,10</b> ±0,004 | 1600-1800   |
| <b>0,15</b> ±0,005 | 1600-1800   |
| <b>0,20</b> ±0,006 | 1600-1800   |
| <b>0,25</b> ±0,007 | 1600-1800   |
| <b>0,30</b> ±0,007 | 1600-1800   |
| <b>0,35</b> ±0,008 | 1600-1800   |
| <b>0,40</b> ±0,009 | 1600-1800   |
| <b>0,45</b> ±0,009 | 1600-1800   |
| <b>0,50</b> ±0,010 | 1600-1800   |
| <b>0,55</b> ±0,010 | 1600-1800   |

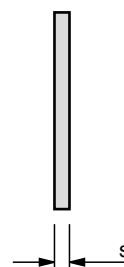
| s                  | zulässige Zugfestigkeit<br>allowed tensile strength<br>[N/mm <sup>2</sup> ] |
|--------------------|---|
| <b>0,60</b> ±0,010 | 1600-1800   |
| <b>0,65</b> ±0,010 | 1600-1800   |
| <b>0,70</b> ±0,012 | 1600-1800   |
| <b>0,75</b> ±0,012 | 1600-1800   |
| <b>0,80</b> ±0,013 | 1600-1800   |
| <b>0,85</b> ±0,013 | 1600-1800   |
| <b>0,90</b> ±0,013 | 1600-1800   |
| <b>0,95</b> ±0,013 | 1600-1800   |
| <b>1,00</b> ±0,013 | 1600-1800   |
|                    |   |
|                    |   |
|                    |   |

[TH]



**TH 434**

 **TH 434 / 1**



| Type | Format    | Anzahl Blätter<br>Number of sheets | Inhalt: je 1 Blatt<br>Content: 1 sheet each                            | Mat.   |
|------|-----------|------------------------------------|--|--------|
| 1    | 50 x 300  | 25                                 | s = 0,01 - 1,00 mm   | 1.1274 |
| 2    | 100 x 500 | 9                                  | s = 0,02 / 0,05 / 0,10 / 0,15 / 0,20 /<br>0,30 / 0,40 / 0,50 / 1,00 mm | 1.4310 |

[TH]

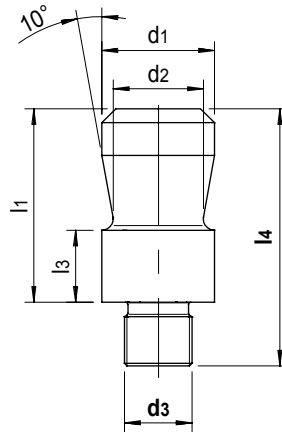


**TH 380**

Mat.: C45

Mat.: C45

 **TH 380 /**  
**M16 x 1,5 x 58**



| d3               | d1<br>d9 | d2 | l1 | l3 | l4         |
|------------------|----------|----|----|----|------------|
| <b>M16 x 1,5</b> | 20       | 15 | 40 | 12 | <b>58</b>  |
| <b>M16 x 1,5</b> | 25       | 20 | 45 | 16 | <b>68</b>  |
| <b>M20 x 1,5</b> | 25       | 20 | 45 | 16 | <b>68</b>  |
| <b>M20 x 1,5</b> | 32       | 25 | 56 | 16 | <b>79</b>  |
| <b>M24 x 1,5</b> | 32       | 25 | 56 | 16 | <b>79</b>  |
| <b>M24 x 1,5</b> | 40       | 32 | 70 | 26 | <b>93</b>  |
| <b>M30 x 2,0</b> | 40       | 32 | 70 | 26 | <b>93</b>  |
| <b>M30 x 2,0</b> | 50       | 42 | 80 | 26 | <b>108</b> |

[TH]





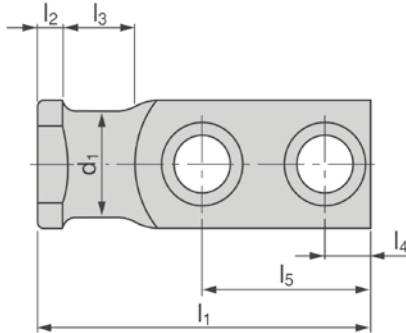
TH 220

Mat.: CK45  
Zugfestigkeit: 700 - 800 N/mm<sup>2</sup>

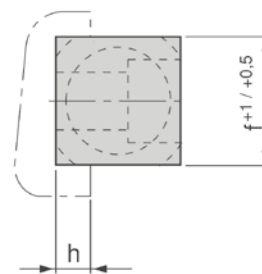
Mat.: CK45  
Tensile strength: 700 - 800 N/mm<sup>2</sup>

TH 220 / 20

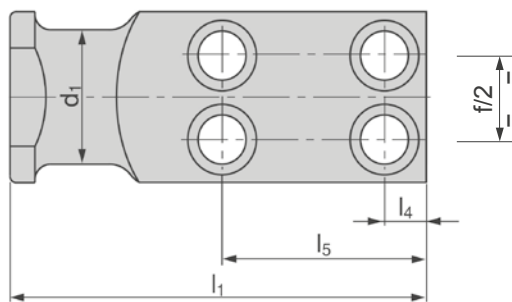
Form - A



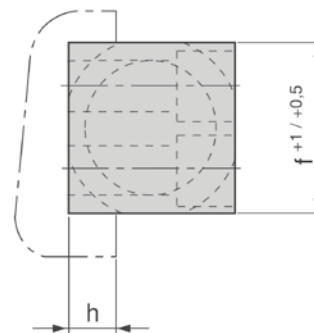
Passung / Seat



Form - B



Passung / Seat



[TH]

| d1<br>±0,1 | Tragfähigkeit<br>Lifting capacity<br>[N] | Form | f   | h  | l1  | l2 | l3 | l4 | l5  | • DIN 912<br>min. 8.8 |
|------------|--|------|-----|----|-----|----|----|----|-----|-----------------------|
| 16         | 3200                                     | A    | 20  | 6  | 80  | 6  | 20 | 10 | 44  | M8 x 25               |
| 20         | 6300                                     | A    | 25  | 8  | 90  | 8  | 25 | 10 | 47  | M10 x 30              |
| 25         | 12500                                    | A    | 35  | 10 | 100 | 8  | 30 | 12 | 50  | M12 x 40              |
| 32         | 20000                                    | A    | 40  | 10 | 120 | 10 | 32 | 16 | 62  | M16 x 45              |
| 40         | 32000                                    | A    | 50  | 12 | 140 | 10 | 40 | 18 | 72  | M20 x 60              |
| 50         | 50000                                    | A    | 60  | 14 | 160 | 12 | 45 | 22 | 81  | M24 x 70              |
| 63         | 80000                                    | B    | 80  | 16 | 200 | 12 | 50 | 20 | 98  | M20 x 90              |
| 80         | 125000                                   | B    | 100 | 18 | 250 | 15 | 65 | 25 | 125 | M24 x 110             |
| 100        | 200000                                   | B    | 120 | 20 | 300 | 15 | 80 | 30 | 155 | M30 x 130             |

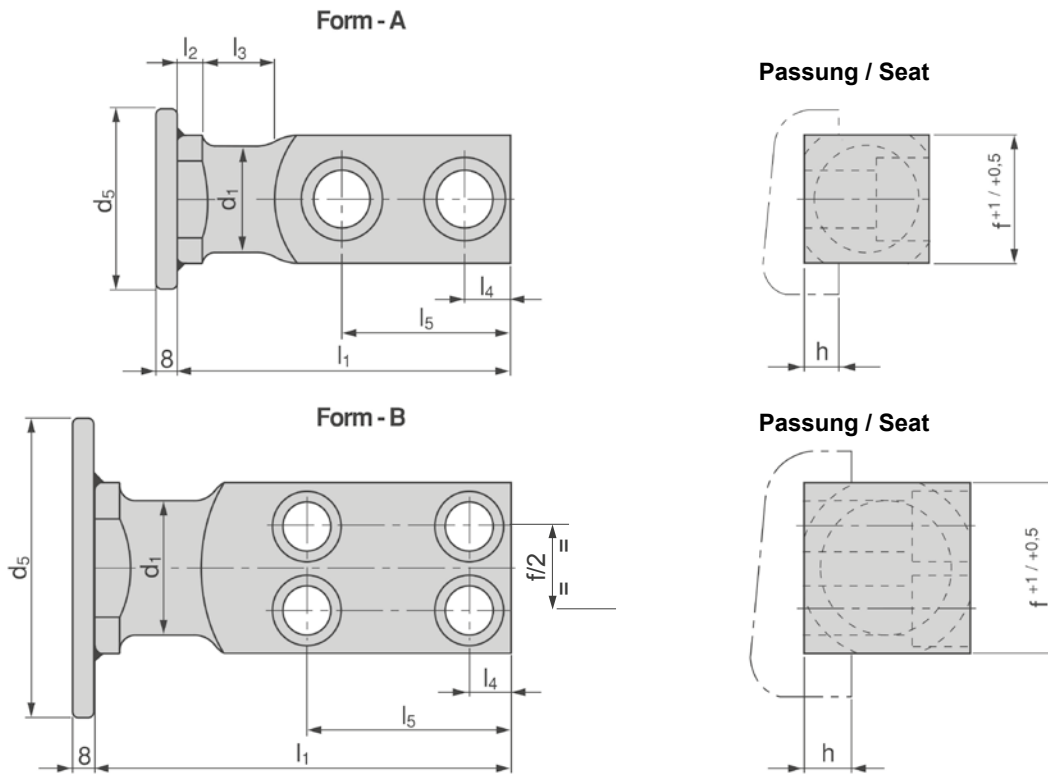


TH 221

Mat.: CK45  
Zugfestigkeit: 700 - 800 N/mm<sup>2</sup>

Mat.: CK45  
Tensile strength: 700 - 800 N/mm<sup>2</sup>

TH 221 / 20



| d1  | Tragfähigkeit<br>Lifting capacity<br>[N] | Form | d5  | f   | h  | l1  | l2 | l3 | l4 | l5  | • DIN 912<br>min. 8.8 |
|-----|--|------|-----|-----|----|-----|----|----|----|-----|-----------------------|
| 16  | 3200                                     | A    | 60  | 20  | 6  | 80  | 6  | 20 | 10 | 44  | M8 x 25               |
| 20  | 6300                                     | A    | 70  | 25  | 8  | 90  | 8  | 25 | 10 | 47  | M10 x 30              |
| 25  | 12500                                    | A    | 70  | 35  | 10 | 100 | 8  | 30 | 12 | 50  | M12 x 40              |
| 32  | 20000                                    | A    | 110 | 40  | 10 | 120 | 10 | 32 | 16 | 62  | M16 x 45              |
| 40  | 32000                                    | A    | 110 | 50  | 12 | 140 | 10 | 40 | 18 | 72  | M20 x 60              |
| 50  | 50000                                    | A    | 150 | 60  | 14 | 160 | 12 | 45 | 22 | 81  | M24 x 70              |
| 63  | 80000                                    | B    | 150 | 80  | 16 | 200 | 12 | 50 | 20 | 98  | M20 x 90              |
| 80  | 125000                                   | B    | 150 | 100 | 18 | 250 | 15 | 65 | 25 | 125 | M24 x 110             |
| 100 | 200000                                   | B    | 150 | 120 | 20 | 300 | 15 | 80 | 30 | 155 | M30 x 130             |

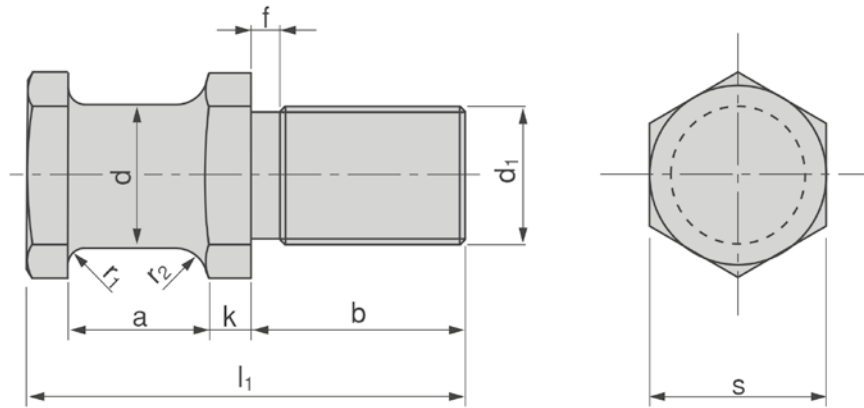


TH 230

Mat.: CK45  
Zugfestigkeit: 700 - 800 N/mm<sup>2</sup>

Mat.: CK45  
Tensile strength: 700 - 800 N/mm<sup>2</sup>

 TH 230 / 20



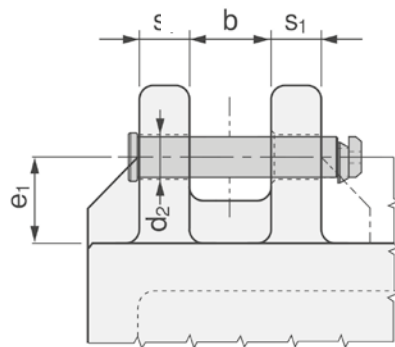
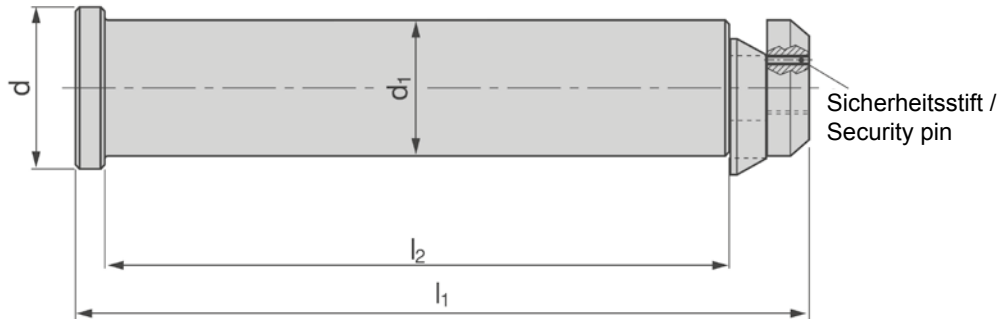
[TH]

| d<br>±0,1 | Tragfähigkeit<br>Lifting capacity<br>[N] | d1  | a  | b<br>±0,5 | f | k  | l1<br>±1 | r1 | r2 | s  |
|-----------|--|-----|----|-----------|---|----|----------|----|----|----|
| 16        | 2500                                     | M16 | 20 | 28        | 3 | 5  | 58       | 5  | 8  | 24 |
| 20        | 5000                                     | M20 | 22 | 34        | 3 | 6  | 68       | 5  | 8  | 30 |
| 25        | 10000                                    | M24 | 25 | 38        | 4 | 8  | 78       | 6  | 10 | 36 |
| 32        | 15000                                    | M30 | 32 | 45        | 5 | 10 | 95       | 6  | 10 | 41 |
| 40        | 25000                                    | M36 | 40 | 56        | 5 | 12 | 118      | 8  | 12 | 50 |



TH 250

TH 250 / 63



| d1  | Tragfähigkeit<br>Lifting capacity<br>[N] | d  | d2 | e1  | l1  | l2  | s1  | Mat.    |
|-----|--|----|----|-----|-----|-----|-----|---------|
| H11 |  |    | +1 |     | +1  | +1  |     |         |
| 32  | 32000                                    | 40 | 34 | 63  | 175 | 145 | 40  | CK45    |
| 40  | 50000                                    | 50 | 42 | 80  | 225 | 188 | 50  | CK45    |
| 50  | 80000                                    | 60 | 52 | 100 | 273 | 230 | 60  | CK45    |
| 63  | 125000                                   | 75 | 65 | 125 | 347 | 295 | 80  | CK45    |
| 76  | 315000                                   | 95 | 78 | 160 | 422 | 360 | 100 | 42CrMo4 |

[TH]

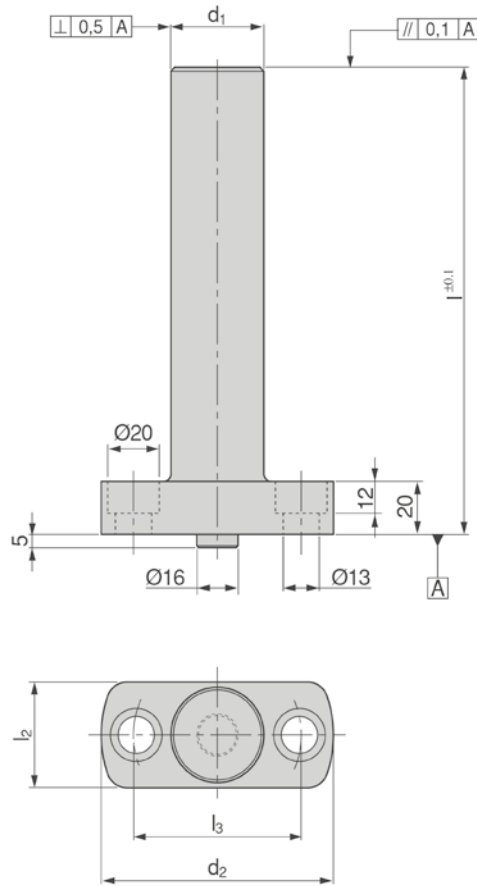


**TH 908**

Mat.: CK45  
Zugfestigkeit: 800 - 1000 N/mm<sup>2</sup>

Mat.: CK45  
Tensile strength: 800 - 1000 N/mm<sup>2</sup>

 **TH 908 / 36 x 185**



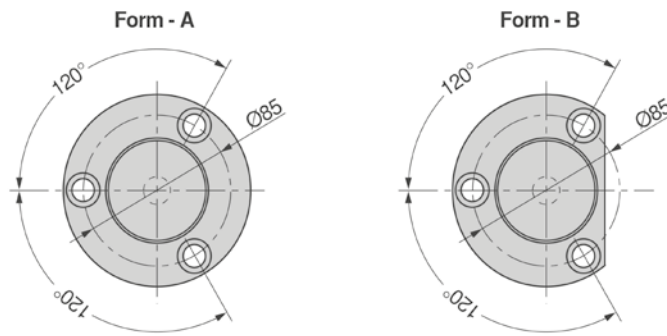
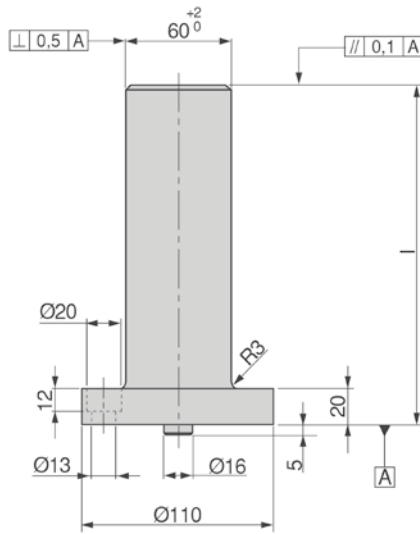
| d1 | l <sub>max.</sub> | d2  | l2 | l3 | Tragfähigkeit<br>Lifting capacity<br>[N] |
|----|-------------------|-----|----|----|--|
| 36 | 360               | 90  | 40 | 65 | 50000                                    |
| 45 | 360               | 100 | 50 | 75 | 70000                                    |

**TH 909**

Mat.: CK45  
Zugfestigkeit: 800 - 1000 N/mm<sup>2</sup>

Mat.: CK45  
Tensile strength: 800 - 1000 N/mm<sup>2</sup>

 **TH 909 / A x 205**



| Form     | $l_{max.}$ | Tragfähigkeit<br>Lifting capacity<br>[N] |
|----------|------------|--|
| <b>A</b> | <b>400</b> | 80000                                    |
| <b>B</b> | <b>400</b> | 80000                                    |

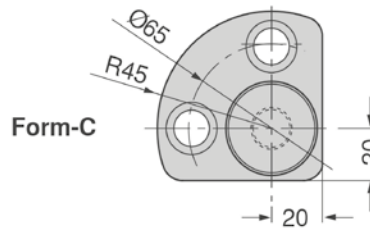
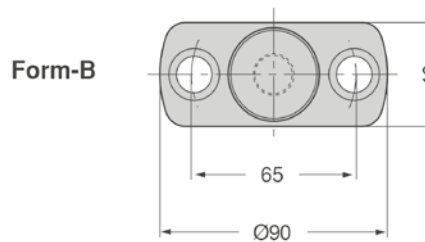
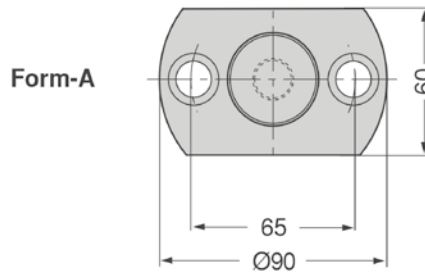
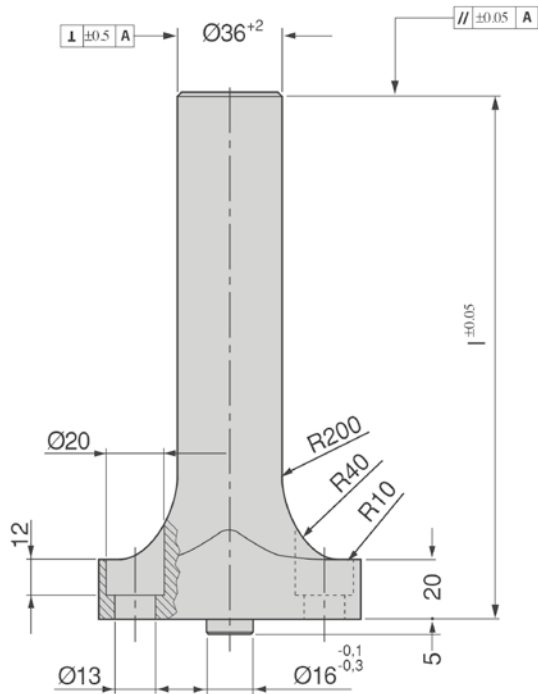
[TH]

**TH 910**

Mat.: CK45  
Zugfestigkeit: 800 - 1000 N/mm<sup>2</sup>

Mat.: CK45  
Tensile strength: 800 - 1000 N/mm<sup>2</sup>

 **TH 910 / A x 285**



| Form | $I_{max}$ | Tragfähigkeit<br>Lifting capacity<br>[N] |
|------|-----------|--|
| A    | 360       | 50000                                    |
| B    | 360       | 50000                                    |
| C    | 360       | 50000                                    |

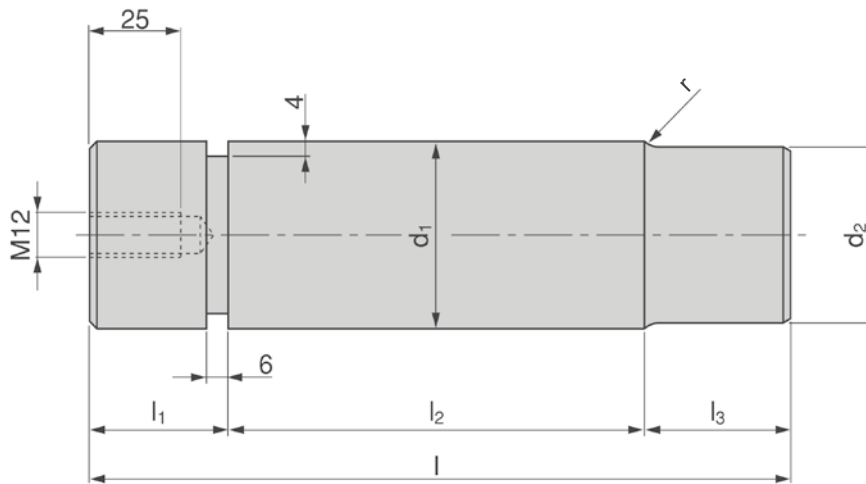
[TH]

TH 911

Mat.: CK45  
Zugfestigkeit: 800 - 1000 N/mm<sup>2</sup>

Mat.: CK45  
Tensile strength: 800 - 1000 N/mm<sup>2</sup>

TH 911 / 32 x 122



| d1 | l   | Dynamische Belastbarkeit<br>Dynamic load [N] | d2<br>+0,05 | l1 | l2  | l3 | r |
|----|-----|--|-------------|----|-----|----|---|
| e8 |     |  |             |    |     |    |   |
| 32 | 105 | 5000   | 29          | 22 | 58  | 25 | 4 |
| 32 | 122 | 5000   | 29          | 22 | 75  | 25 | 4 |
| 40 | 139 | 7500   | 37          | 32 | 75  | 32 | 5 |
| 40 | 159 | 7500   | 37          | 32 | 95  | 32 | 5 |
| 50 | 167 | 12500  | 47          | 32 | 95  | 40 | 6 |
| 50 | 192 | 12500  | 47          | 32 | 120 | 40 | 6 |
| 63 | 202 | 25000  | 60          | 32 | 120 | 50 | 6 |
| 63 | 237 | 25000  | 60          | 32 | 155 | 50 | 6 |

[TH]

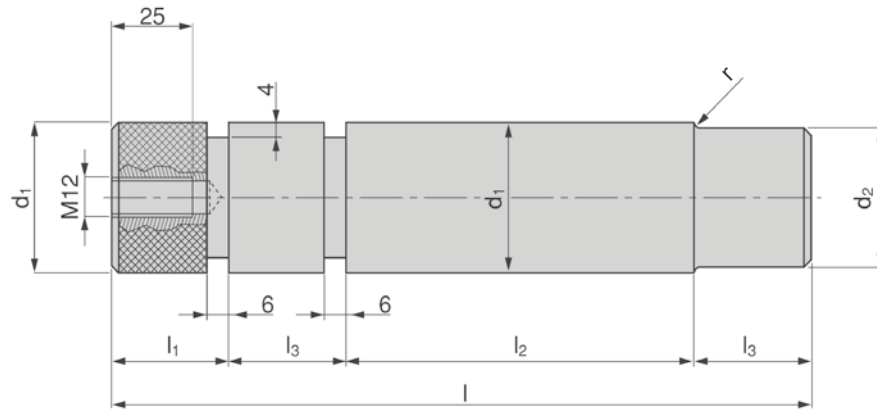


**TH 912**

Mat.: 42CrMo5  
Zugfestigkeit: 800 - 1000 N/mm<sup>2</sup>

Mat.: 42CrMo5  
Tensile strength: 800 - 1000 N/mm<sup>2</sup>

 **TH 912 / 32 x 147**



[TH]

| d1<br>e8 | l   | Dynamische<br>Belastbarkeit<br>Dynamic load<br>[N] | d2<br>+0.05 | l1 | l2  | l3 | r |
|----------|-----|--|-------------|----|-----|----|---|
| 32       | 130 | 5000   | 29          | 22 | 58  | 25 | 4 |
| 32       | 147 | 5000   | 29          | 22 | 75  | 25 | 4 |
| 40       | 171 | 7500   | 37          | 32 | 75  | 32 | 5 |
| 40       | 191 | 7500   | 37          | 32 | 95  | 32 | 5 |
| 50       | 207 | 12500  | 47          | 32 | 95  | 40 | 6 |
| 50       | 232 | 12500  | 47          | 32 | 120 | 40 | 6 |
| 63       | 252 | 25000  | 60          | 32 | 120 | 50 | 6 |
| 63       | 287 | 25000  | 60          | 32 | 155 | 50 | 6 |

TH 57 R

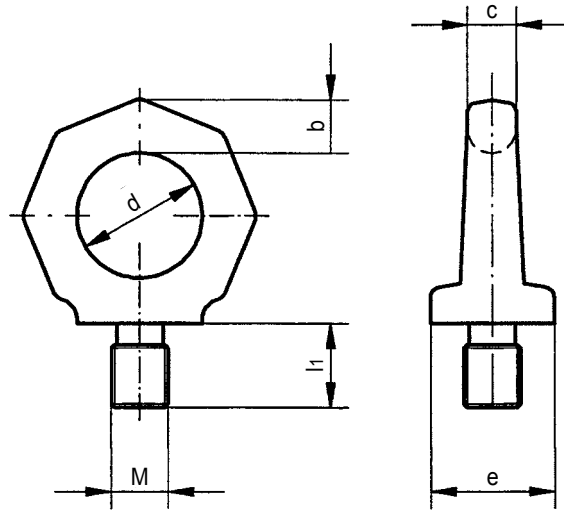
Minimum-Einschraublänge:

- 1 x M in Stahl (min. St. 37)
- 1,25 x M in Guss
- 2 x M in Alluminium

Min. depth of thread engagement:

- 1 x M in steel (St.37 min)
- 1,25 x M in cast iron
- 2 x M in aluminum

TH 57 R / M36



| M   | Tragfähigkeit [t]<br>Lifting capacity [t] |      | l <sub>1</sub> | b  | c  | d  | e   |
|-----|---|------|----------------|----|----|----|-----|
|     |   |      |                |    |    |    |     |
| M6  | 0,4                                       | 0,10 | 35             | 10 | 12 | 25 | 25  |
| M8  | 0,8                                       | 0,20 | 35             | 10 | 12 | 25 | 25  |
| M10 | 1,0                                       | 0,25 | 35             | 10 | 15 | 25 | 25  |
| M12 | 1,6                                       | 0,40 | 41             | 12 | 18 | 30 | 30  |
| M14 | 3,0                                       | 0,75 | 48             | 14 | 21 | 35 | 35  |
| M16 | 4,0                                       | 1,0  | 48             | 16 | 24 | 35 | 35  |
| M20 | 6,0                                       | 1,5  | 55             | 20 | 30 | 40 | 40  |
| M24 | 8,0                                       | 2,0  | 70             | 20 | 36 | 50 | 50  |
| M30 | 12,0                                      | 3,0  | 85             | 24 | 45 | 60 | 60  |
| M36 | 16,0                                      | 4,0  | 130            | 43 | 54 | 90 | 100 |
| M42 | 24,0                                      | 6,0  | 130            | 43 | 63 | 90 | 100 |
| M48 | 32,0                                      | 8,0  | 130            | 43 | 68 | 90 | 100 |

Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weight „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

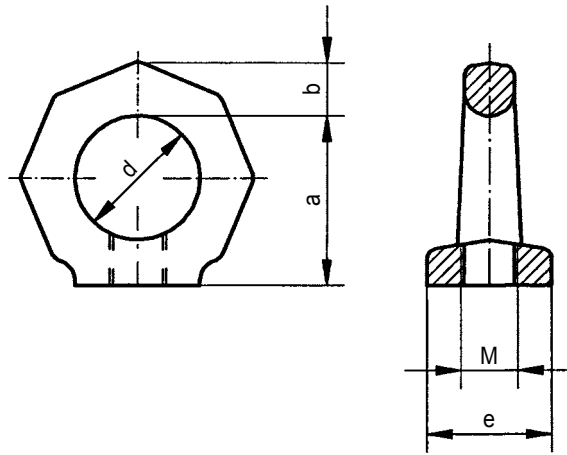




**TH 58 R**

Das Gewindeanschlussstück muss min. die Güte 8.8 haben.

The thread connection must have at least a property grade of 8.8.

 **TH 58 R / M36**



| M          | Tragfähigkeit [t]<br>Lifting capacity [t]   |   | a   | b  | d  | e   |
|------------|---|---|-----|----|----|-----|
|            |  |  |     |    |    |     |
| <b>M6</b>  | 0,4   | 0,10  | 35  | 10 | 25 | 25  |
| <b>M8</b>  | 0,8   | 0,20  | 35  | 10 | 25 | 25  |
| <b>M10</b> | 1,0   | 0,25  | 35  | 10 | 25 | 25  |
| <b>M12</b> | 1,6   | 0,40  | 41  | 12 | 30 | 30  |
| <b>M14</b> | 3,0   | 0,75  | 48  | 14 | 35 | 35  |
| <b>M16</b> | 4,0   | 1,0   | 48  | 16 | 35 | 35  |
| <b>M20</b> | 6,0   | 1,5   | 55  | 20 | 40 | 40  |
| <b>M24</b> | 8,0   | 2,0   | 70  | 20 | 50 | 50  |
| <b>M30</b> | 12,0  | 3,0   | 85  | 24 | 60 | 60  |
| <b>M36</b> | 16,0  | 4,0   | 130 | 43 | 90 | 100 |
| <b>M42</b> | 24,0  | 6,0   | 130 | 43 | 90 | 100 |
| <b>M48</b> | 32,0  | 8,0   | 130 | 43 | 90 | 100 |

Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weight „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

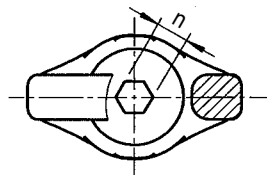
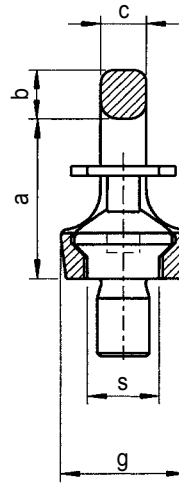
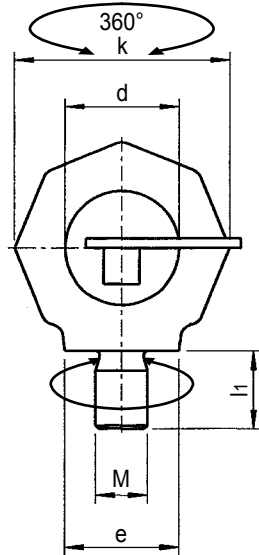
[TH]

TH 55 R

Minimum-Einschraublänge:  
 1 x M in Stahl (min. St. 37)  
 1,25 x M in Guss  
 2 x M in Aluminium

Min. depth of thread engagement:  
 1 x M in steel (St.37 min)  
 1,25 x M in cast iron  
 2 x M in aluminum

TH 58 R / M36



| M   | Tragfähigkeit [t]<br>Lifting capacity [t] |      | a   | b  | c    | d  | e   | g   | k   | l1 | n  | s    |
|-----|---|------|-----|----|------|----|-----|-----|-----|----|----|------|
|     |   |      |     |    |      |    |     |     |     |    |    |      |
| M8  | 0,8                                       | 0,40 | 34  | 11 | 8,5  | 25 | 25  | 28  | 47  | 12 | 6  | 16,0 |
| M10 | 1,0                                       | 0,40 | 34  | 11 | 8,5  | 25 | 25  | 28  | 47  | 15 | 6  | 15,0 |
| M12 | 2,0                                       | 0,75 | 42  | 13 | 10,0 | 30 | 30  | 34  | 56  | 18 | 8  | 18,0 |
| M16 | 4,0                                       | 1,5  | 49  | 15 | 14,0 | 35 | 35  | 40  | 65  | 24 | 10 | 22,0 |
| M20 | 6,0                                       | 2,3  | 57  | 17 | 16,0 | 40 | 40  | 50  | 75  | 30 | 12 | 27,5 |
| M24 | 8,0                                       | 3,2  | 69  | 21 | 19,0 | 48 | 48  | 60  | 90  | 36 | 14 | 33,0 |
| M30 | 12,0                                      | 4,5  | 86  | 26 | 24,0 | 60 | 60  | 75  | 112 | 45 | 17 | 41,5 |
| M36 | 16,0                                      | 7,0  | 103 | 32 | 29,0 | 72 | 75  | 90  | 135 | 54 | 22 | 49,5 |
| M42 | 24,0                                      | 9,0  | 120 | 38 | 34,0 | 82 | 85  | 105 | 158 | 63 | 24 | 58,0 |
| M48 | 32,0                                      | 12,0 | 137 | 43 | 38,0 | 94 | 100 | 125 | 180 | 72 | 27 | 66,0 |

Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weight „G“ in „t“ under various lifting conditions (t = Tonnen / tons)



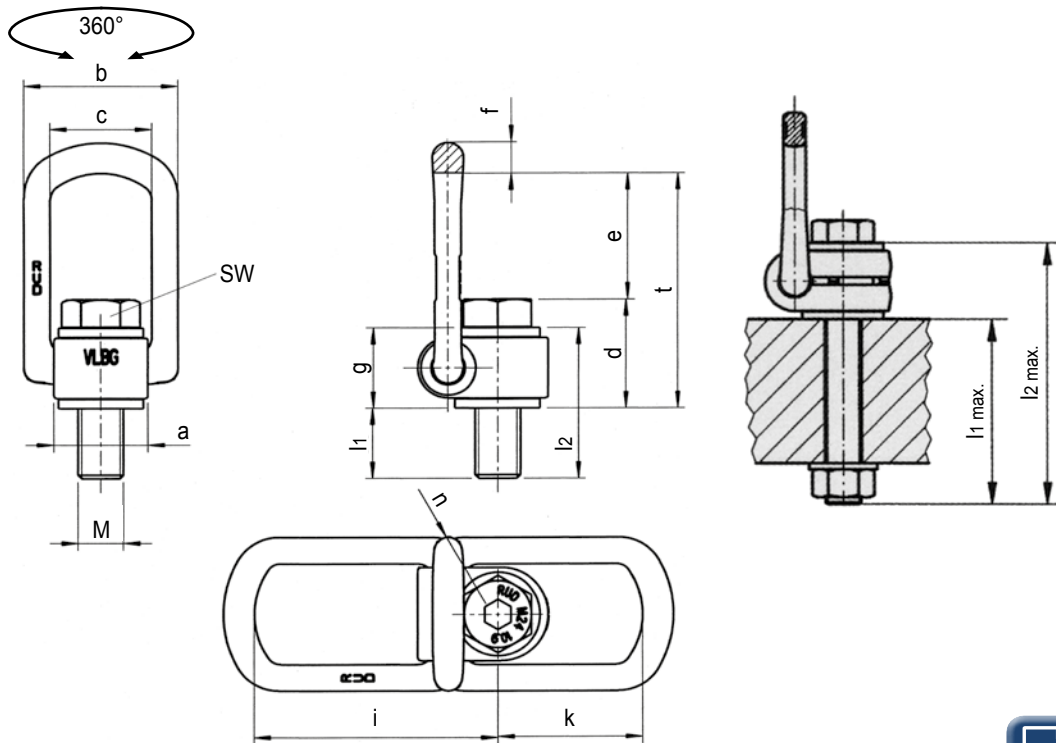
TH 56 R

Lastbock um 360° drehbar, in Zugrichtung einstellbar, Lastbügel klappbar, volle Tragfähigkeit in allen Richtungen, Typ Vario für Durchgangsbohrungen geeignet.

Hoist ring is stowable and pivots in all directions. The hoist ring must be flexible and adjusted to the load direction before being loaded. Ensure that there is no contact between the ring and the edges of the work piece.

TH 56 R / M27 / Standard

Avoid swiveling under full load. A single threaded hole or a through hole is necessary. A very small construction.



[TH]

| M   | Tragfähigkeit [t]<br>Lifting capacity [t] |      | a  | b   | c   | d   | e   | f    | g  | l1       |       | i   | k   | l2       |       | n  | SW | t   | Anzugsmoment<br>Fastening torque |
|-----|---|------|----|-----|-----|-----|-----|------|----|----------|-------|-----|-----|----------|-------|----|----|-----|----------------------------------|
|     |   |      |    |     |     |     |     |      |    | Standard | Vario |     |     | Standard | Vario |    |    |     |                                  |
| M8  | 0,3                                       | 0,3  | 30 | 54  | 34  | 35  | 40  | 10,0 | 29 | 11       | 76    | 77  | 45  | 40       | 105   | 5  | 13 | 75  | 30                               |
| M10 | 0,63                                      | 0,63 | 30 | 54  | 34  | 36  | 39  | 10,0 | 29 | 16       | 96    | 77  | 45  | 45       | 125   | 6  | 17 | 75  | 60                               |
| M12 | 1,0                                       | 1,0  | 32 | 54  | 34  | 37  | 38  | 10,0 | 29 | 21       | 116   | 77  | 45  | 50       | 145   | 8  | 19 | 75  | 100                              |
| M16 | 1,5                                       | 1,5  | 33 | 63  | 36  | 46  | 39  | 13,5 | 36 | 24       | 149   | 76  | 35  | 60       | 185   | 10 | 24 | 73  | 150                              |
| M20 | 2,2                                       | 2,2  | 50 | 82  | 54  | 55  | 55  | 16,5 | 43 | 32       | 187   | 95  | 45  | 75       | 230   | 12 | 30 | 92  | 250                              |
| M24 | 4,0                                       | 4,0  | 50 | 82  | 54  | 58  | 66  | 18,0 | 43 | 37       | 222   | 95  | 45  | 80       | 265   | 14 | 36 | 125 | 350                              |
| M27 | 4,0                                       | 4,0  | 60 | 110 | 65  | 78  | 69  | 22,5 | 61 | 39       | -     | 138 | 67  | 78       | -     | -  | 41 | 133 | 400                              |
| M30 | 5,0                                       | 5,0  | 60 | 110 | 65  | 80  | 67  | 22,5 | 61 | 49       | 279   | 138 | 67  | 110      | 340   | 17 | 46 | 132 | 500                              |
| M36 | 6,5                                       | 6,5  | 60 | 110 | 65  | 72  | 74  | 22,5 | 55 | 52       | -     | 138 | 67  | 107      | -     | -  | 55 | 132 | 650                              |
| M42 | 10,0                                      | 10,0 | 75 | 145 | 80  | 103 | 110 | 36,0 | 77 | 73       | 273   | 170 | 80  | 150      | 350   | 24 | 65 | 162 | 1000                             |
| M48 | 20,0                                      | 20,0 | 95 | 185 | 100 | 117 | 105 | 36,0 | 87 | 73       | 303   | 200 | 100 | 160      | 390   | 27 | 70 | 192 | 2000                             |

Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weight „G“ in „t“ under various lifting conditions (t = Tonnen / tons)



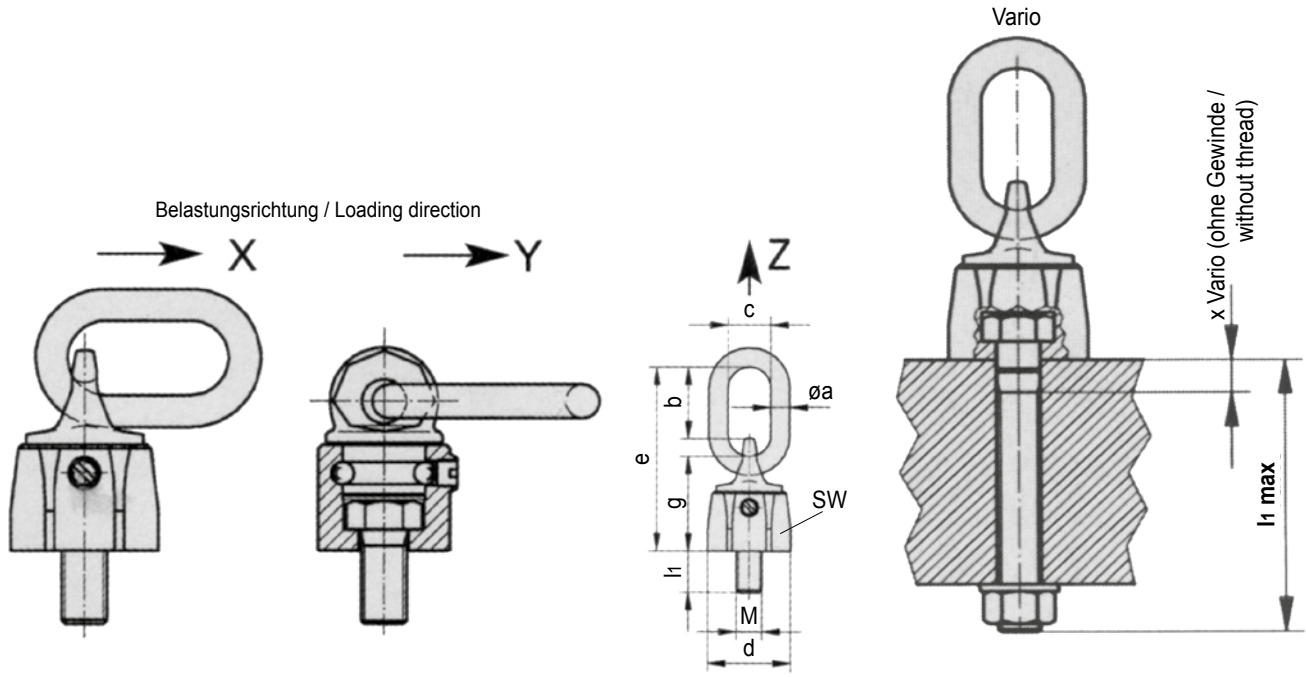
TH 54 R

Kugelgelagert unter Last 360° drehbar. Allseitig belastbar bei vierfacher Sicherheit. Nicht unter Vollast bei 90° zur Gewindeebene (XY) drehbar. Typ Vario für Durchgangsbohrungen geeignet.

Suitable for all loads which swivel and tilt. Can be loaded in all directions with a 4 : 1 safety factor. Swiveling under full load is permitted provided the inclination angle is not perpendicular to the screw - in direction.

TH 54 R /  
M12 / Standard

Not suitable for permanent swiveling under full load. Suitable for through bores.



| M   | Tragfähigkeit [t]<br>Lifting capacity [t] |      | a  | b   | c  | d  | e   | l1       |       | g   | SW | x   |
|-----|---|------|----|-----|----|----|-----|----------|-------|-----|----|-----|
|     |   |      |    |     |    |    |     | Standard | Vario |     |    |     |
| M8  | 0,6                                       | 0,3  | 8  | 33  | 29 | 36 | 76  | 13       | 102   | 36  | 28 | 18  |
| M10 | 0,9                                       | 0,45 | 8  | 33  | 29 | 36 | 78  | 17       | 122   | 38  | 30 | 19  |
| M12 | 1,2                                       | 0,6  | 10 | 51  | 35 | 42 | 105 | 21       | 140   | 45  | 36 | 19  |
| M16 | 2,6                                       | 1,3  | 10 | 49  | 35 | 48 | 114 | 30       | 180   | 54  | 41 | 28  |
| M20 | 4,0                                       | 2,0  | 13 | 56  | 35 | 64 | 135 | 33       | 223   | 65  | 55 | 30  |
| M24 | 7,0                                       | 3,5  | 18 | 68  | 40 | 81 | 172 | 40       | 255   | 87  | 70 | 25  |
| M30 | 10,0                                      | 5,0  | 22 | 93  | 50 | 99 | 220 | 50       | 330   | 105 | 85 | 32  |
| M30 | 5,0                                       | 5,0  | 60 | 110 | 65 | 80 | 67  | 49       | 279   | 138 | 67 | 340 |

Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weight „G“ in „t“ under various lifting conditions (t = Tonnen / tons)



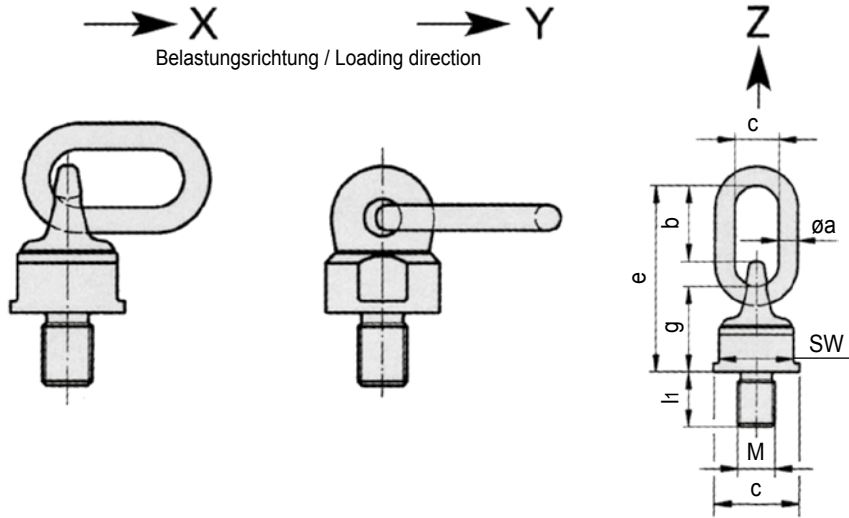
**TH 59 R**

Kugelgelagert unter Last 360° drehbar. Allseitig belastbar bei vierfacher Sicherheit. Nicht für Dauer-Drehbewegungen und für Drehen 90° unter Vollast geeignet.

Suitable for all loads which swivel and tilt. Can be loaded in all directions with a 4 : 1 design factor. Swiveling under full load is permitted provided the inclination angle is not perpendicular to the screw - in direction.

**TH 59 R / M56**

Not suitable for permanent swiveling under full load. Suitable for through bores.



[TH]

| M   | Tragfähigkeit [t]<br>Lifting capacity [t] |      | a  | b   | c  | d   | e   | l1  | g   | SW  |
|-----|---|------|----|-----|----|-----|-----|-----|-----|-----|
|     |   |      |    |     |    |     |     |     |     |     |
| M36 | 12,5                                      | 8,0  | 22 | 87  | 50 | 90  | 210 | 54  | 99  | 80  |
| M42 | 16,0                                      | 10,0 | 26 | 112 | 65 | 98  | 240 | 63  | 100 | 85  |
| M48 | 25,0                                      | 15,0 | 26 | 112 | 65 | 98  | 240 | 68  | 100 | 85  |
| M56 | 35,0                                      | 25,0 | 32 | 120 | 70 | 120 | –   | 84  | 130 | 95  |
| M64 | 35,0                                      | 30,0 | 32 | 120 | 70 | 120 | –   | 95  | 130 | 95  |
| M90 | 35,0                                      | 35,0 | 40 | 170 | 80 | 170 | 345 | 135 | 165 | 130 |

Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weight „G“ in „t“ under various lifting conditions (t = Tonnen / tons)



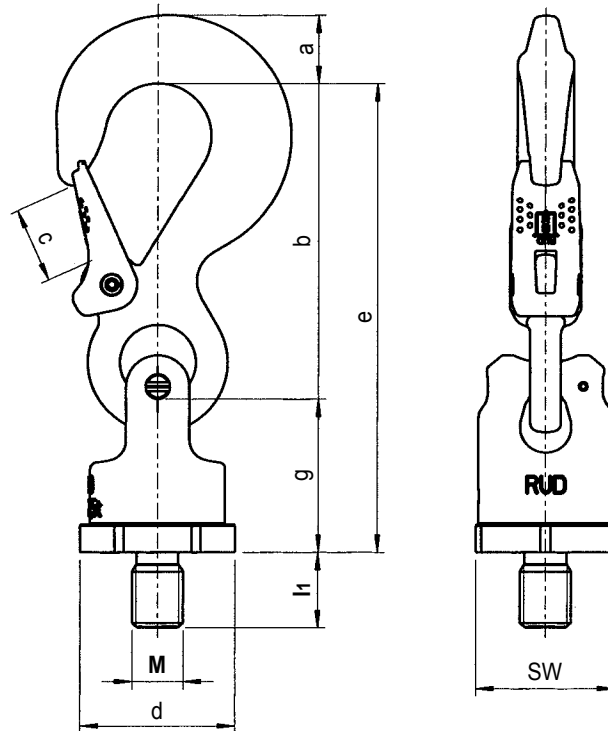
**TH 53 R**



Doppelt kugelgelagert für Ruckfreies Kippen, Drehen und Wenden. Passen für alle Anschlagmittel - wie Haken, Ösen oder Schlingen. Nicht drehbar bei 90° unter Vollast zur Gewindeebene.

The first generation of lifting points with a universal connection for all slinging means (hook and ring assemblies, endless slings, round slings, loops etc). With a double ball bearing

 **TH 53 R / M24**

for jerk - free turning, swiveling and tilting. Even under full load can be turned in a 90° position from the bolt centre line. Not suitable for permanent swiveling under full load.



| M          | Tragfähigkeit [t]<br>Lifting capacity [t]   |   | a  | b   | c  | d   | e   | h  | g   | SW |
|------------|---|---|----|-----|----|-----|-----|----|-----|----|
|            |  |  |    |     |    |     |     |    |     |    |
| <b>M16</b> | 1,5   | 1,5   | 20 | 97  | 25 | 46  | 147 | 25 | 50  | 41 |
| <b>M20</b> | 2,5   | 2,5   | 28 | 126 | 30 | 61  | 187 | 30 | 61  | 55 |
| <b>M24</b> | 4,0   | 4,0   | 36 | 150 | 35 | 78  | 227 | 36 | 77  | 70 |
| <b>M30</b> | 6,5   | 6,5   | 37 | 174 | 40 | 95  | 267 | 45 | 93  | 85 |
| <b>M36</b> | 8,0   | 8,0   | 49 | 208 | 48 | 100 | 310 | 54 | 102 | 90 |

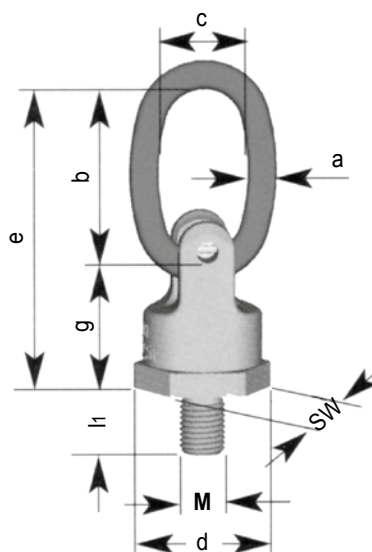
Transportgewicht „G“ in „t“ bei verschiedenen Anschlagarten. / Transport weight „G“ in „t“ under various lifting conditions (t = Tonnen / tons)





TH 60 R

TH 60 R / M20



| M   | Tragfähigkeit [t]<br>Lifting capacity [t] |      | a  | b   | c  | d   | e   | h  | g   | SW |
|-----|---|------|----|-----|----|-----|-----|----|-----|----|
|     |   |      |    |     |    |     |     |    |     |    |
| M12 | 0,63                                      | 0,63 | 9  | 65  | 35 | 40  | 105 | 18 | 41  | 36 |
| M16 | 1,5                                       | 1,5  | 11 | 65  | 35 | 46  | 115 | 24 | 50  | 41 |
| M20 | 2,5                                       | 2,5  | 13 | 75  | 40 | 61  | 135 | 30 | 61  | 55 |
| M24 | 4,0                                       | 4,0  | 16 | 95  | 45 | 78  | 172 | 36 | 78  | 70 |
| M30 | 5,0                                       | 5,0  | 21 | 130 | 60 | 95  | 223 | 45 | 93  | 85 |
| M36 | 8,0                                       | 8,0  | 24 | 140 | 65 | 100 | 242 | 54 | 102 | 90 |

Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weight „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

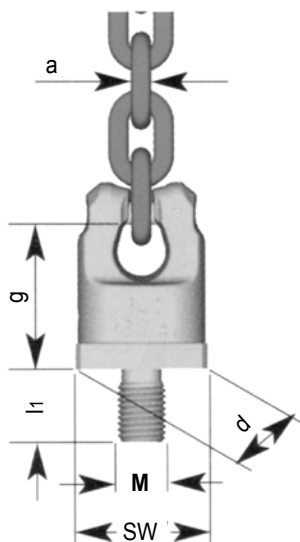
[TH]

TH 61 R

Wirbelböcke für Ketten. Nur Ketten der Güteklasse 10 verwenden.

Lifting points with a double ball bearing for direct connection of the chain. Even under full load, can be turned in a 90° position from the bolt centre line. Not suitable for permanent swiveling under full load.

TH 61 R / M24



| M   | Tragfähigkeit [t]<br>Lifting capacity [t] |      | Kettenanschluss a<br>Chain connection a | d   | l1 | g   | SW |
|-----|---|------|---|-----|----|-----|----|
|     |   |      |   |     |    |     |    |
| M12 | 0,63                                      | 0,63 | 4                                       | 40  | 18 | 41  | 36 |
| M16 | 1,5                                       | 1,5  | 6                                       | 46  | 25 | 50  | 41 |
| M20 | 2,5                                       | 2,5  | 8                                       | 61  | 30 | 61  | 55 |
| M24 | 4,0                                       | 4,0  | 10                                      | 78  | 36 | 77  | 70 |
| M30 | 5,0                                       | 5,0  | 13                                      | 95  | 45 | 93  | 85 |
| M36 | 8,0                                       | 8,0  | 16                                      | 100 | 54 | 102 | 90 |

Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weight „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

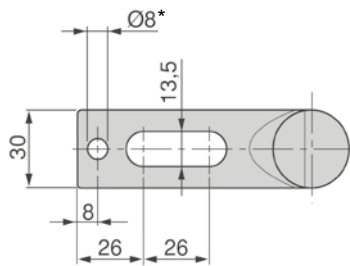
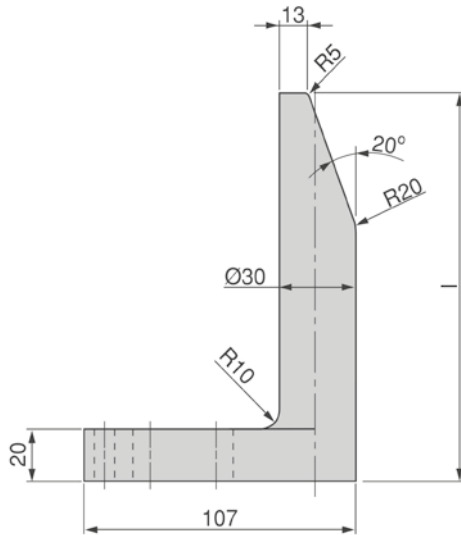


TH 900

Mat.: CK45, gegossen

Mat.: CK45, casted

 TH 900 / 090



\* Vorbohrung für Zylinderstift

\* Pilot hole for dowel pin

Platinen-Einweiser immer in eine Nut einsetzen.

Always place pilot gage into groove.



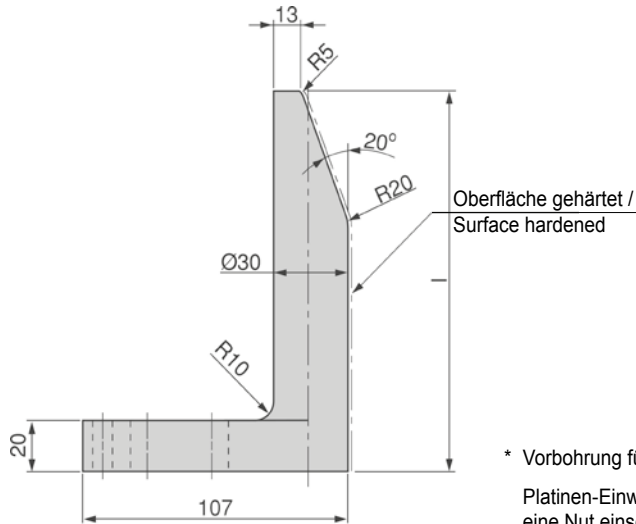
| I   |
|-----|
| 065 |
| 090 |
| 120 |
| 150 |
| 180 |
| 250 |
| 300 |
| 350 |

**TH 900 ... CH**

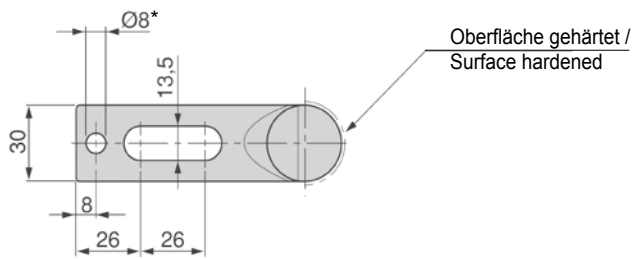
Mat.: CK45, gegossen  
induktiv gehärtet  
Härte: 50 - 55 HRC

Mat.: CK45, casted  
inductively hardened  
Hardness: 50 - 55 HRC

**TH 900 / 065 / CH**



\* Vorbohrung für Zylinderstift \* Pilot hole for dowel pin  
Platinen-Einweiser immer in  
eine Nut einsetzen. Always place pilot gage into  
groove.



| I   |
|-----|
| 065 |
| 090 |
| 120 |
| 150 |
| 180 |
| 250 |
| 300 |
| 350 |

[TH]

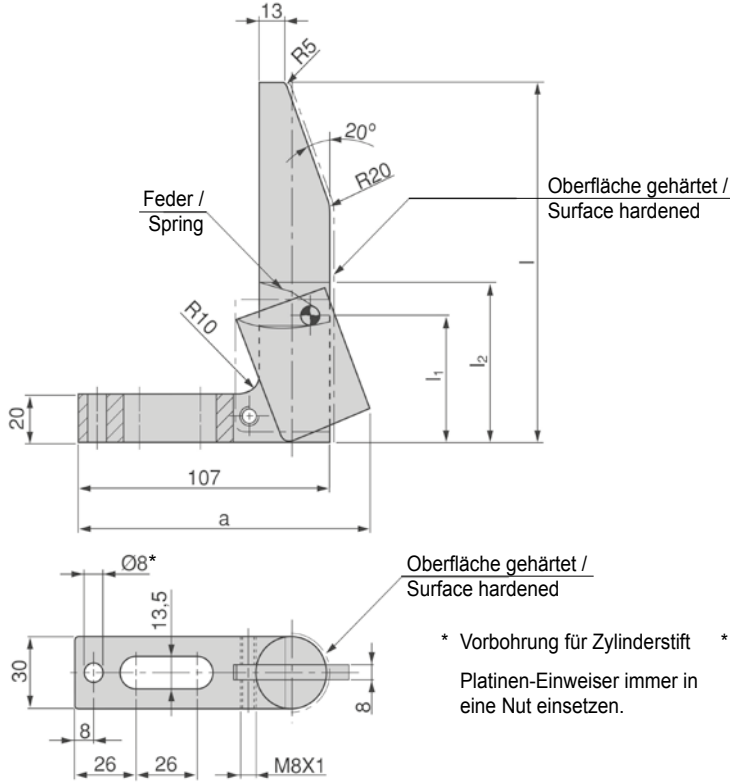


**TH 901**

Mat.: CK45, gegossen  
induktiv gehärtet  
Härte: 50 - 55 HRC

Mat.: CK45, casted  
inductively hardened  
Hardness: 50 - 55 HRC

**TH 901 / 150**



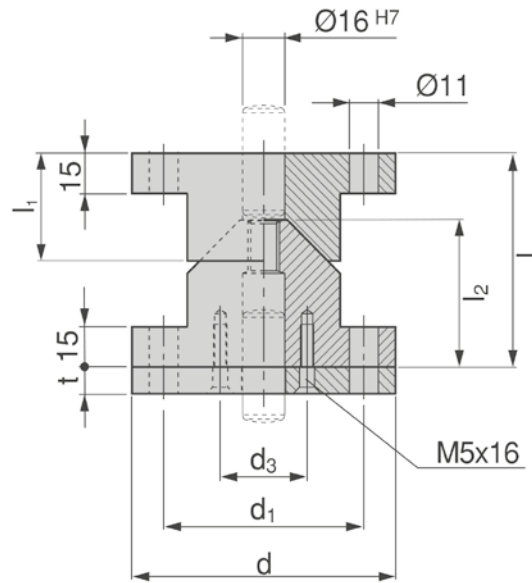
| l   | l1  | l2  | a   |
|-----|-----|-----|-----|
| 120 | 56  | 70  | 120 |
| 150 | 56  | 70  | 120 |
| 180 | 107 | 120 | 124 |
| 250 | 107 | 120 | 124 |

TH 920

Mat.: 16MnCr5, gehärtet  
Randschichthärte: 60 - 64 HRC

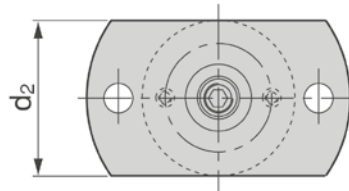
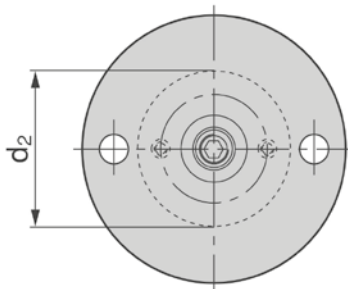
Mat.: 16MnCr5, hardened  
Surface hardness: 60 - 64 HRC

TH 920 / A x 100



Form-A

Form-B



| Form | d   | d1 | d2 | d3   | l  | l2 | t    |
|------|-----|----|----|------|----|----|------|
| A    | 100 | 76 | 58 | 40,5 | 80 | 55 | 10,5 |
| B    | 100 | 76 | 58 | 40,5 | 80 | 55 | 10,5 |
| A    | 120 | 96 | 78 | 50,5 | 90 | 65 | 10,5 |
| B    | 120 | 96 | 78 | 50,5 | 90 | 65 | 10,5 |

[TH]

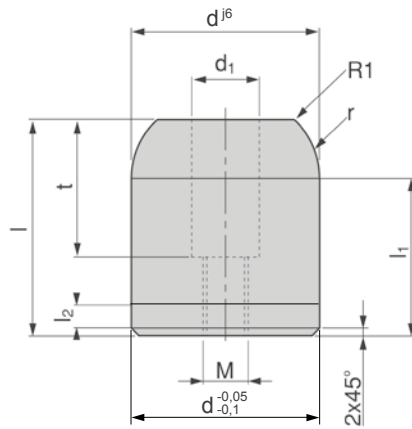


TH 943

Mat.: 16MnCr5, gehärtet  
Randschichthärte: 60 - 64 HRC

Mat.: 16MnCr5, hardened  
Surface hardness: 60 - 64 HRC

TH 943 / 32 x 50



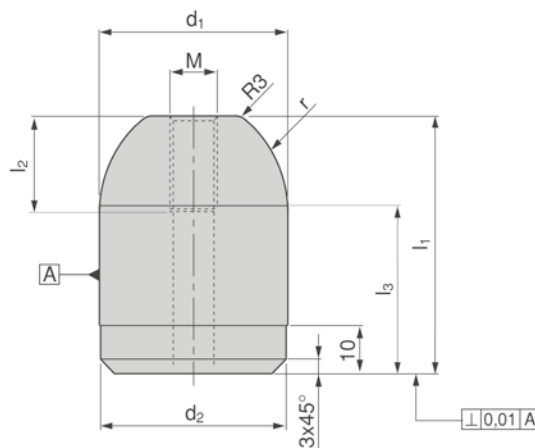
| d  | l  | d1<br>+0,2 | l1   | l2 | M   | r    | t  |
|----|----|------------|------|----|-----|------|----|
| 22 | 45 | 14         | 37,5 | 8  | M10 | 12,5 | 25 |
| 32 | 50 | 18         | 40   | 10 | M12 | 20   | 35 |
| 40 | 55 | 18         | 40   | 10 | M12 | 20   | 35 |
| 50 | 55 | 18         | 40   | 10 | M12 | 20   | 35 |

TH 944

Mat.: 16MnCr5, gehärtet  
Randschichthärte: 60 - 64 HRC

Mat.: 16MnCr5, hardened  
Surface hardness: 60 - 64 HRC

TH 944 / 32 x 50



| d1<br>h6 | l1<br>+0,2 | d2<br>-0,05 | l2<br>+0,2 | l3<br>+0,2 | M   | r<br>+0,2 |
|----------|------------|-------------|------------|------------|-----|-----------|
| 22       | 45         | 22          | 16         | 35         | M8  | 15        |
| 22       | 55         | 22          | 16         | 45         | M8  | 15        |
| 32       | 50         | 32          | 20         | 37,5       | M10 | 20        |
| 40       | 55         | 40          | 20         | 35         | M10 | 25        |
| 40       | 65         | 40          | 20         | 45         | M10 | 25        |
| 40       | 85         | 40          | 20         | 65         | M10 | 25        |
| 50       | 55         | 50          | 20         | 41,25      | M10 | 25        |
| 56       | 80         | 56          | 20         | 60         | M10 | 30        |

[TH]



**NCC. . .**

**Produktmerkmale/Anwendung:**

- Montageplatte „seitlich“ verschraubt
- größere Befestigungsfläche
- Führungsleisten selbstschmierend
- Rückstellung durch Gasdruckfedern
- Schrägeinbau siehe Beispiel

**Anwendung:**

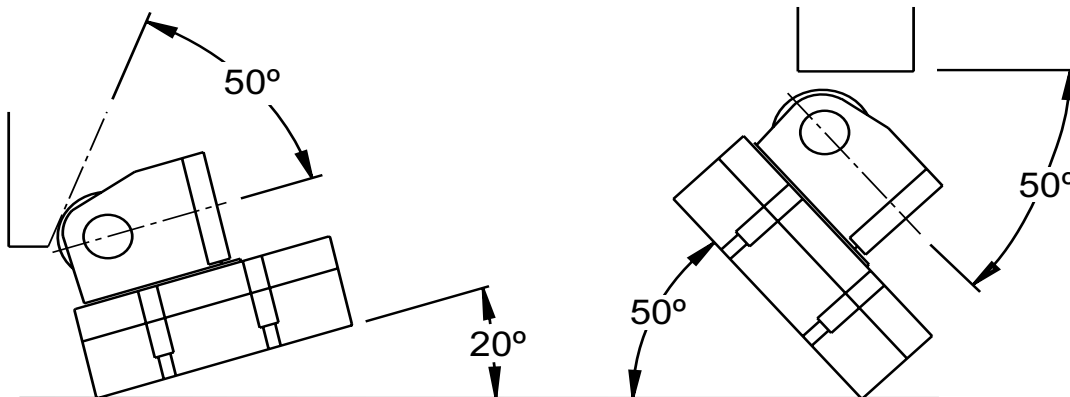
- Umformen
- Sicken
- Lochen
- Beschneiden

**Features:**

- Mounting plate screwed on the side
- larger mounting-area
- Wear plates, self lube
- Return by gas springs
- Angular assembly, please see sample

**Application:**

- Metal forming
- Crimp
- Piercing
- Cutting



Schrägeinbau (Pos. 1) über 20° bitte Rücksprache! /  
In case of angular assembly (Pos. 1) of over 20°, please consult our technical staff!

[TH]




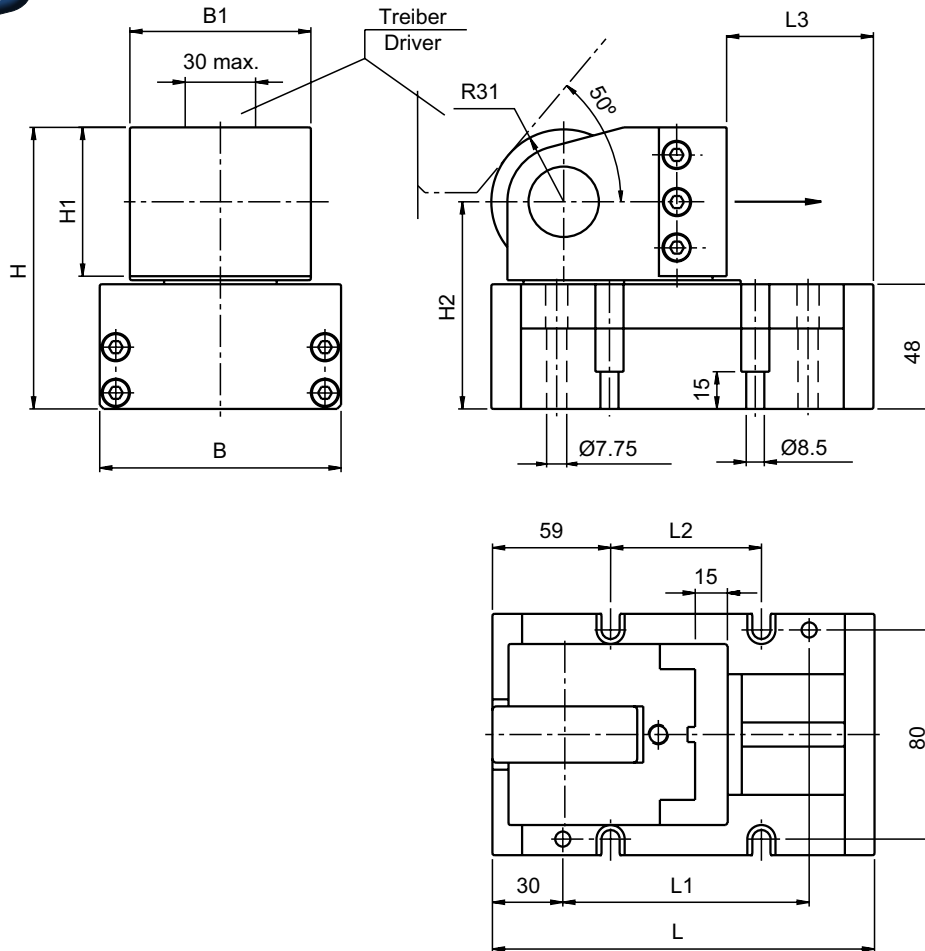


NCC.2.1

Empfohlener max. Hub:  
 NCC.2.1.1: 50 mm  
 NCC.2.1.2: 72 mm  
 NCC.2.1.3: 90 mm

Recommended max stroke:  
 NCC.2.1.1: 50 mm  
 NCC.2.1.2: 72 mm  
 NCC.2.1.3: 90 mm

 NCC.2.1.1



| Type      | Hub Stroke | B   | B1 | H   | H1 | H2  | L   | L1  | L2  | L3 | E | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|-----------|------------|-----|----|-----|----|-----|-----|-----|-----|----|---|---|---------------------------------------|---------------------------------------|
| NCC.2.1.1 | 50         | 100 | 63 | 117 | 63 | 86  | 190 | 134 | 76  | 74 | - | 3000                                      | 150                                   | NC.071.00.00150.063,5                 |
| NCC.2.1.2 | 80         | 100 | 63 | 117 | 63 | 86  | 220 | 164 | 106 | 74 | - | 3000                                      | 150                                   | NC.071.00.00150.080                   |
| NCC.2.1.3 | 100        | 100 | 63 | 141 | 87 | 110 | 260 | 204 | 146 | 74 | - | 3000                                      | 150                                   | NC.071.00.00150.100                   |

[TH]

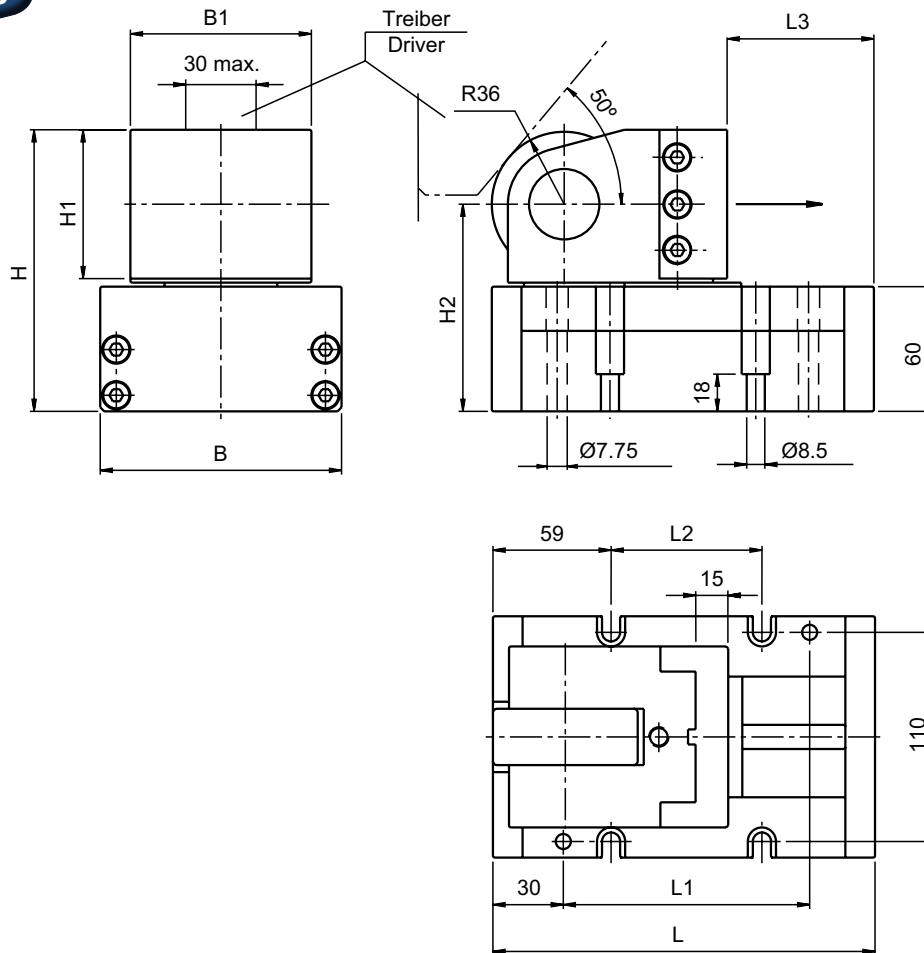


NCC.2.2

Empfohlener max. Hub:  
 NCC.2.2.1: 50 mm  
 NCC.2.2.2: 72 mm  
 NCC.2.2.3: 90 mm

Recommended max stroke:  
 NCC.2.2.1: 50 mm  
 NCC.2.2.2: 72 mm  
 NCC.2.2.3: 90 mm

NCC.2.2.1



| Type      | Hub Stroke | B   | B1 | H   | H1 | H2  | L   | L1  | L2  | L3 | E | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|-----------|------------|-----|----|-----|----|-----|-----|-----|-----|----|---|---|---------------------------------------|---------------------------------------|
| NCC.2.2.1 | 50         | 130 | 90 | 140 | 74 | 103 | 190 | 134 | 76  | 74 | - | 5000                                      | 150                                   | NC.071.00.00150.063,5                 |
| NCC.2.2.2 | 80         | 130 | 90 | 140 | 74 | 103 | 220 | 164 | 106 | 74 | - | 5000                                      | 150                                   | NC.071.00.00150.080                   |
| NCC.2.2.3 | 100        | 130 | 90 | 157 | 91 | 120 | 260 | 204 | 146 | 74 | - | 5000                                      | 150                                   | NC.071.00.00150.100                   |

[TH]




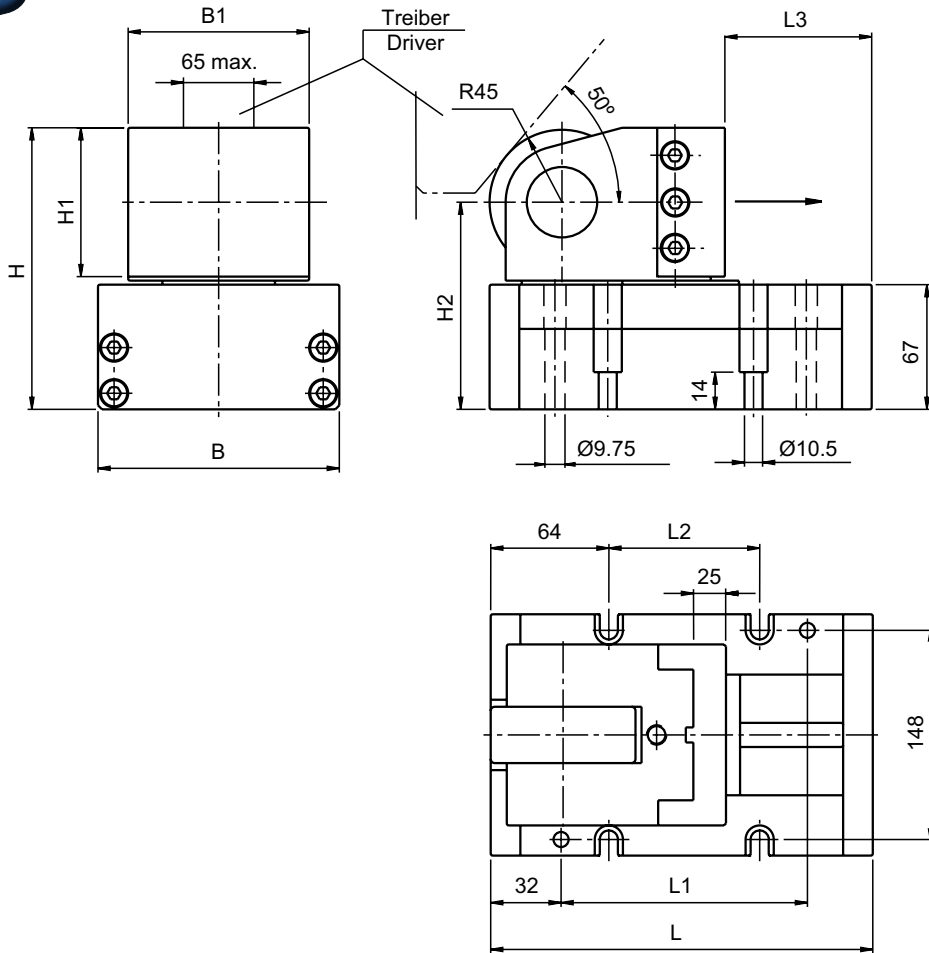
**NCC.2.3**



Empfohlener max. Hub:  
 NCC.2.3.1: 50 mm  
 NCC.2.3.2: 72 mm  
 NCC.2.3.3: 90 mm

Recommended max stroke:  
 NCC.2.3.1: 50 mm  
 NCC.2.3.2: 72 mm  
 NCC.2.3.3: 90 mm

 **NCC.2.3.1**



| Type             | Hub Stroke | B   | B1  | H   | H1 | H2  | L   | L1  | L2  | L3 | E | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|------------------|------------|-----|-----|-----|----|-----|-----|-----|-----|----|---|---|---------------------------------------|---------------------------------------|
| <b>NCC.2.3.1</b> | 50         | 170 | 135 | 165 | 90 | 120 | 190 | 131 | 67  | 43 | - | 15000                                     | 250                                   | NC.071.00.00250.063,5                 |
| <b>NCC.2.3.2</b> | 80         | 170 | 135 | 165 | 90 | 120 | 220 | 161 | 97  | 73 | - | 15000                                     | 250                                   | NC.071.00.00250.080                   |
| <b>NCC.2.3.3</b> | 100        | 170 | 135 | 165 | 90 | 120 | 260 | 201 | 137 | 73 | - | 15000                                     | 250                                   | NC.071.00.00250.100                   |

[TH]



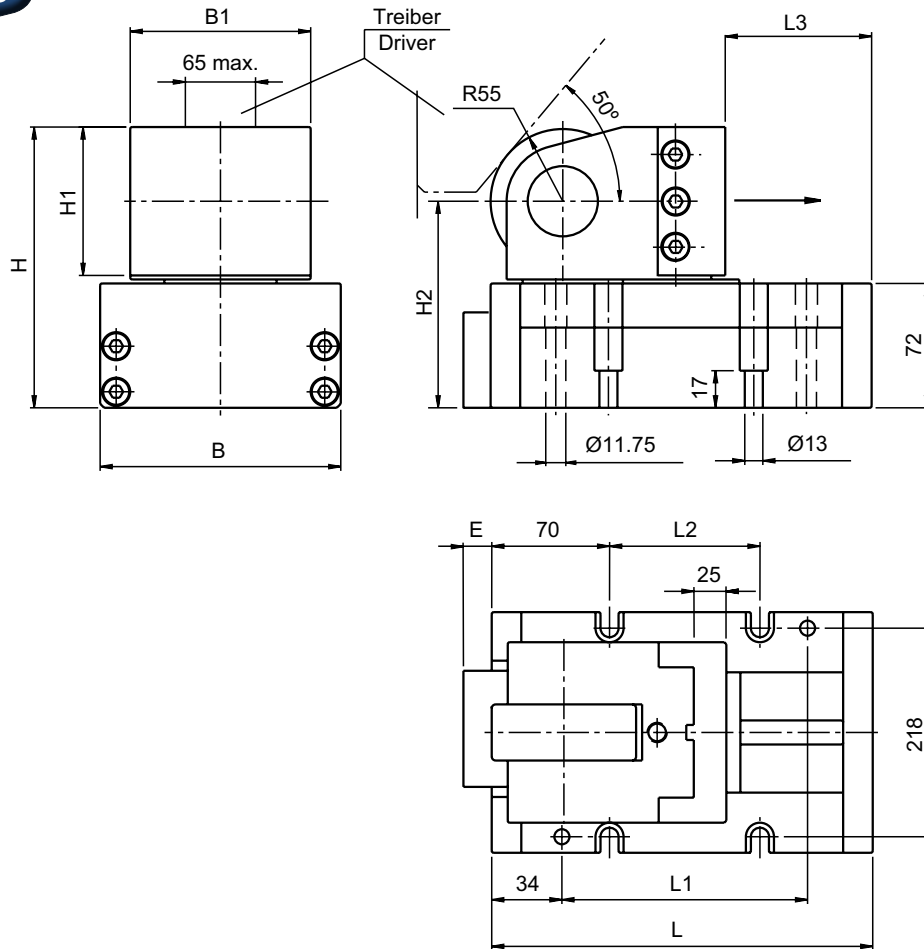
**NCC.2.4**



Empfohlener max. Hub:  
 NCC.2.4.1: 50 mm  
 NCC.2.4.2: 72 mm  
 NCC.2.4.3: 90 mm

Recommended max stroke:  
 NCC.2.4.1: 50 mm  
 NCC.2.4.2: 72 mm  
 NCC.2.4.3: 90 mm

 **NCC.2.4.1**



| Type             | Hub Stroke | B   | B1  | H   | H1  | H2  | L   | L1  | L2  | L3 | E  | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|------------------|------------|-----|-----|-----|-----|-----|-----|-----|-----|----|----|---|---------------------------------------|---------------------------------------|
| <b>NCC.2.4.1</b> | 50         | 240 | 200 | 190 | 110 | 135 | 220 | 152 | 80  | 48 | 7  | 20000                                     | 500                                   | NC.071.00.00500.063,5                 |
| <b>NCC.2.4.2</b> | 80         | 240 | 200 | 190 | 110 | 135 | 250 | 182 | 110 | 78 | 10 | 20000                                     | 500                                   | NC.071.00.00500.080                   |
| <b>NCC.2.4.3</b> | 100        | 240 | 200 | 190 | 110 | 135 | 270 | 202 | 130 | 78 | 10 | 20000                                     | 500                                   | NC.071.00.00500.100                   |

[TH]



**NCC.4.1**



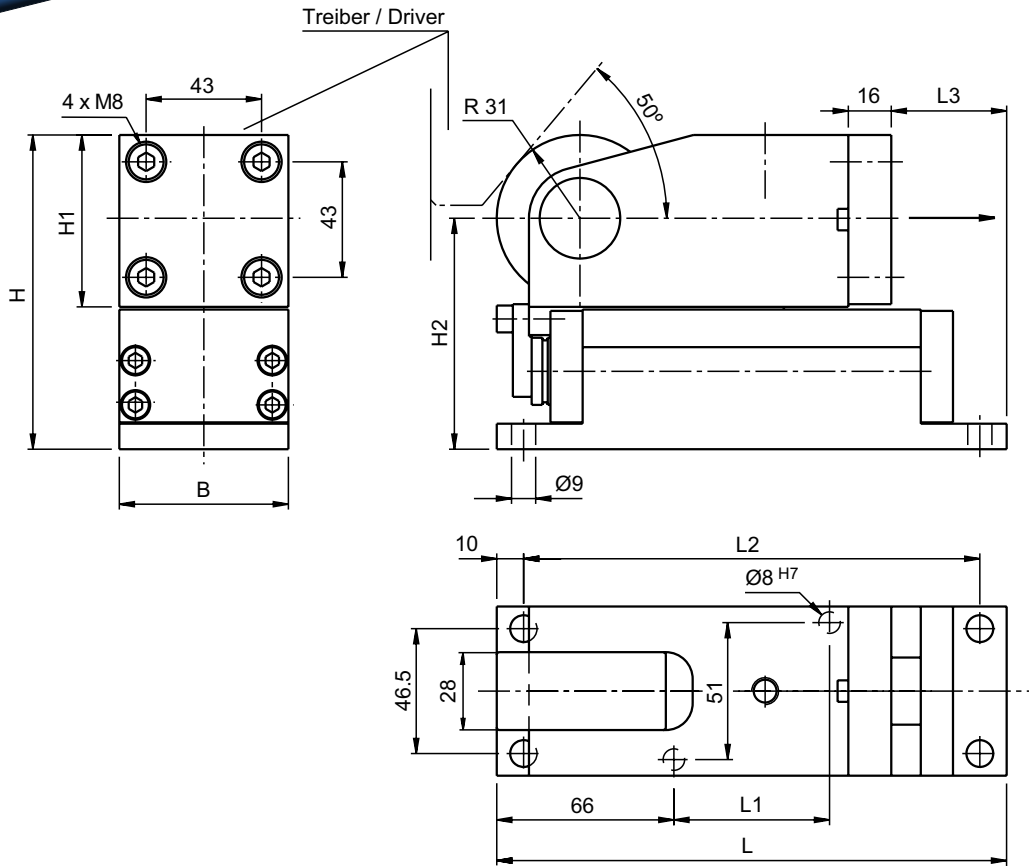
nach CNOMO-Norm

Empfohlener max. Hub:  
NCC.4.1.1: 45 mm  
NCC.4.1.2: 72 mm

acc. to CNOMO-standard

Recommended max stroke:  
NCC.4.1.1: 45 mm  
NCC.4.1.2: 72 mm

 **NCC.4.1.1**



| Type      | Hub Stroke | B  | H   | H1 | H2 | L   | L1 | L2  | L3 | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|-----------|------------|----|-----|----|----|-----|----|-----|----|---|---------------------------------------|---------------------------------------|
| NCC.4.1.1 | 50         | 63 | 117 | 63 | 86 | 190 | 58 | 170 | 43 | 3000                                      | 100                                   | NC.054.00.00100.050                   |
| NCC.4.1.2 | 80         | 63 | 117 | 63 | 86 | 220 | 88 | 200 | 73 | 3000                                      | 100                                   | NC.054.00.00100.080                   |

[TH]

**NCC.4.2**



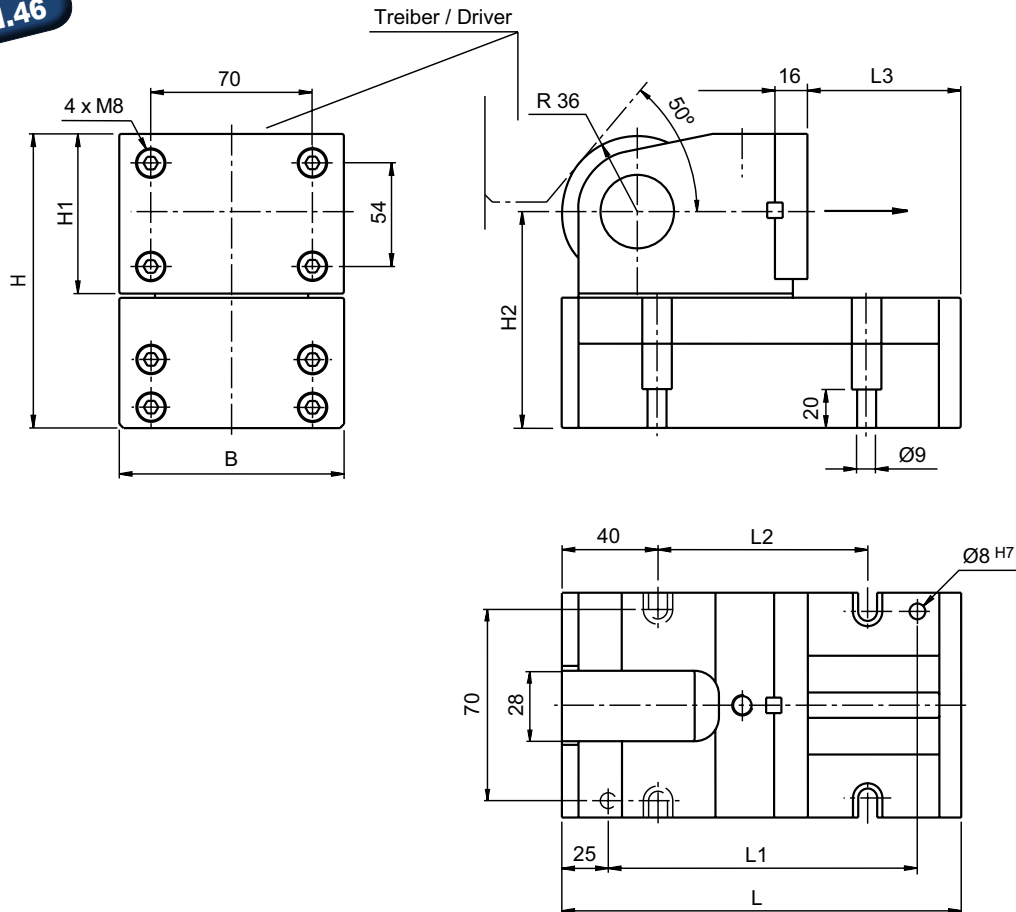
nach CNOMO-Norm

Empfohlener max. Hub:  
 NCC.4.2.1: 45 mm  
 NCC.4.2.2: 72 mm  
 NCC.4.2.3: 90 mm

acc. to CNOMO-standard

Recommended max stroke::  
 NCC.4.2.1: 45 mm  
 NCC.4.2.2: 72 mm  
 NCC.4.2.3: 90 mm

**NCC.4.2.1**



| Type             | Hub Stroke | B  | H   | H1 | H2  | L   | L1  | L2  | L3  | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|------------------|------------|----|-----|----|-----|-----|-----|-----|-----|---|---------------------------------------|---------------------------------------|
| <b>NCC.4.2.1</b> | 50         | 90 | 140 | 74 | 103 | 190 | 140 | 110 | 43  | 5000                                      | 100                                   | NC.071.00.00100.050                   |
| <b>NCC.4.2.2</b> | 80         | 90 | 140 | 74 | 103 | 220 | 170 | 140 | 73  | 5000                                      | 100                                   | NC.071.00.00100.080                   |
| <b>NCC.4.2.3</b> | 100        | 90 | 157 | 74 | 120 | 260 | 210 | 180 | 102 | 5000                                      | 100                                   | NC.071.00.00100.100                   |



**NCC.4.3**



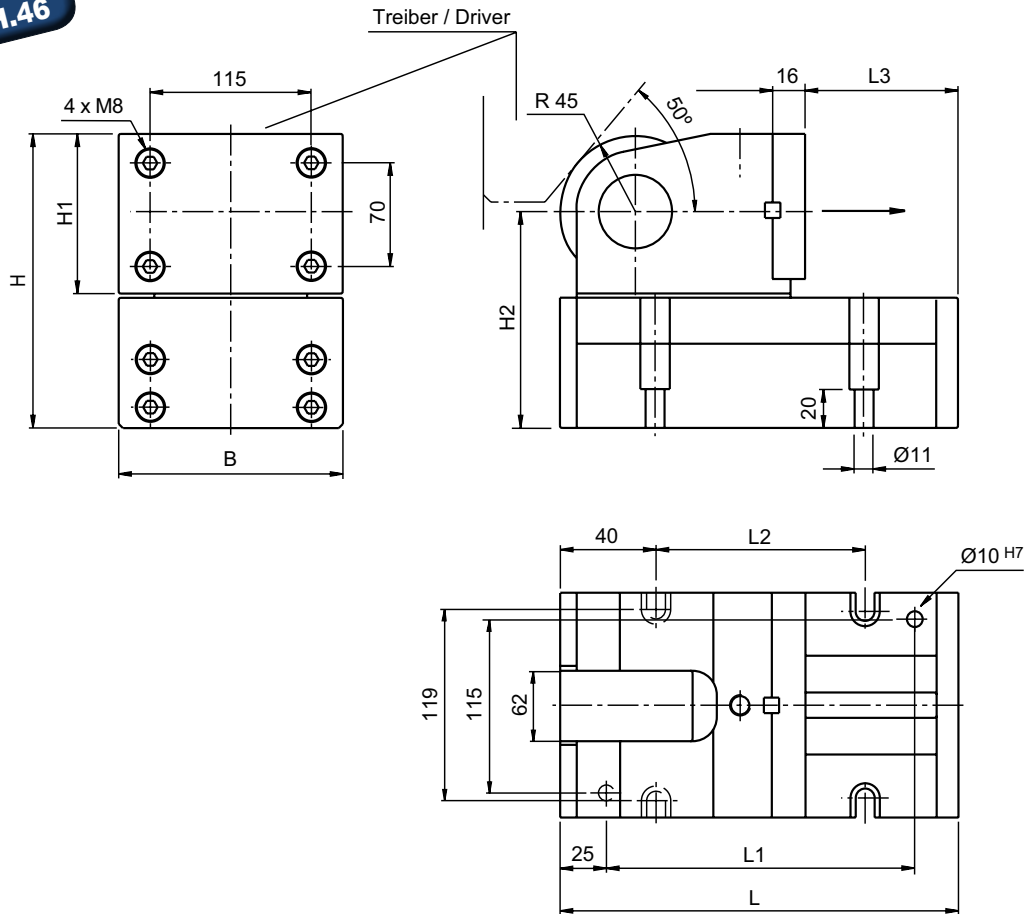
nach CNOMO-Norm

Empfohlener max. Hub:  
 NCC.4.3.1: 45 mm  
 NCC.4.3.2: 72 mm  
 NCC.4.3.3: 90 mm

acc. to CNOMO-standard

Recommended max stroke::  
 NCC.4.3.1: 45 mm  
 NCC.4.3.2: 72 mm  
 NCC.4.3.3: 90 mm

 **NCC.4.3.1**



| Type             | Hub Stroke | B   | H   | H1 | H2  | L   | L1  | L2  | L3 | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|------------------|------------|-----|-----|----|-----|-----|-----|-----|----|---|---------------------------------------|---------------------------------------|
| <b>NCC.4.3.1</b> | 50         | 135 | 160 | 90 | 115 | 190 | 140 | 110 | 43 | 15000                                     | 150                                   | NC.071.00.00150.050                   |
| <b>NCC.4.3.2</b> | 80         | 135 | 160 | 90 | 115 | 220 | 170 | 140 | 73 | 15000                                     | 150                                   | NC.071.00.00150.080                   |
| <b>NCC.4.3.3</b> | 100        | 135 | 177 | 90 | 132 | 260 | 210 | 180 | 93 | 15000                                     | 150                                   | NC.071.00.00150.100                   |

[TH]



**NCC.4.4**



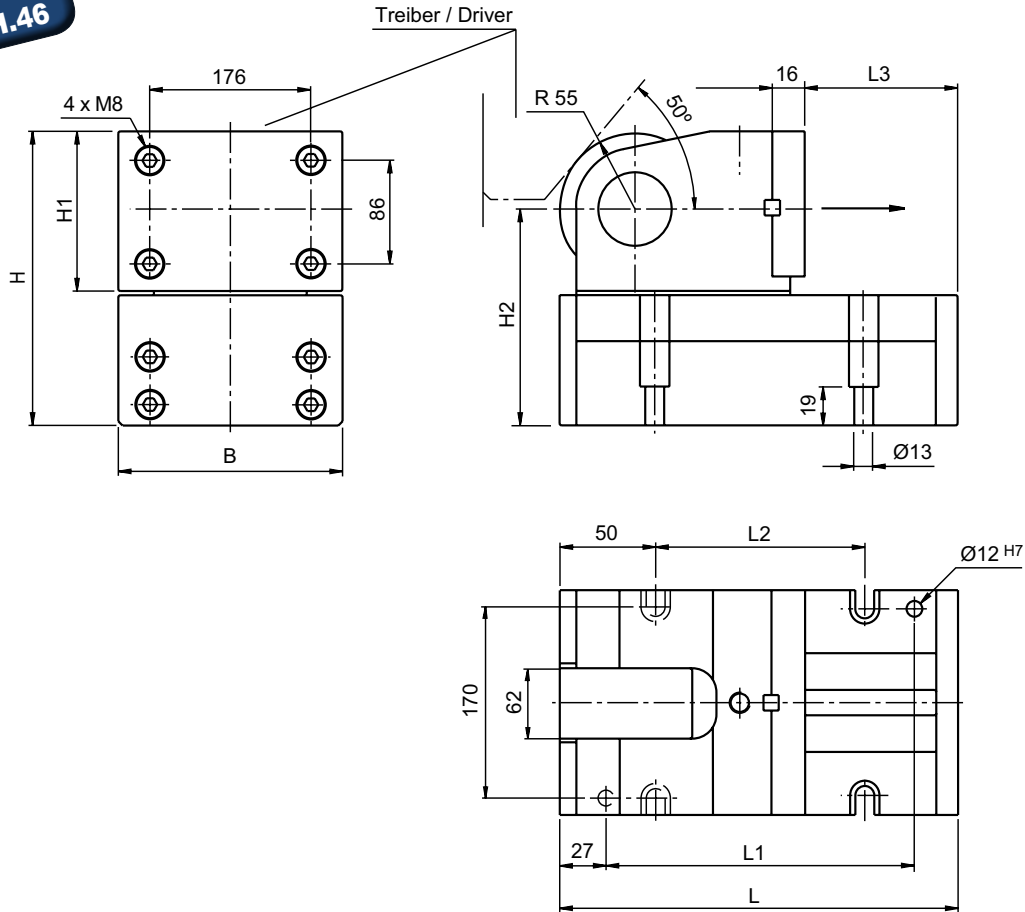
nach CNOMO-Norm

Empfohlener max. Hub:  
 NCC.4.4.1: 45 mm  
 NCC.4.4.2: 72 mm  
 NCC.4.4.3: 90 mm

acc. to CNOMO-standard

Recommended max stroke::  
 NCC.4.4.1: 45 mm  
 NCC.4.4.2: 72 mm  
 NCC.4.4.3: 90 mm

 **NCC.4.4.1**



| Type             | Hub Stroke | B   | H   | H1  | H2  | L   | L1  | L2  | L3 | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|------------------|------------|-----|-----|-----|-----|-----|-----|-----|----|---|---------------------------------------|---------------------------------------|
| <b>NCC.4.4.1</b> | 50         | 200 | 182 | 110 | 127 | 215 | 161 | 115 | 43 | 20000                                     | 250                                   | NC.071.00.00250.050                   |
| <b>NCC.4.4.2</b> | 80         | 200 | 182 | 110 | 127 | 245 | 191 | 145 | 73 | 20000                                     | 250                                   | NC.071.00.00250.080                   |
| <b>NCC.4.4.3</b> | 100        | 200 | 182 | 110 | 127 | 265 | 211 | 165 | 93 | 20000                                     | 250                                   | NC.071.00.00250.100                   |



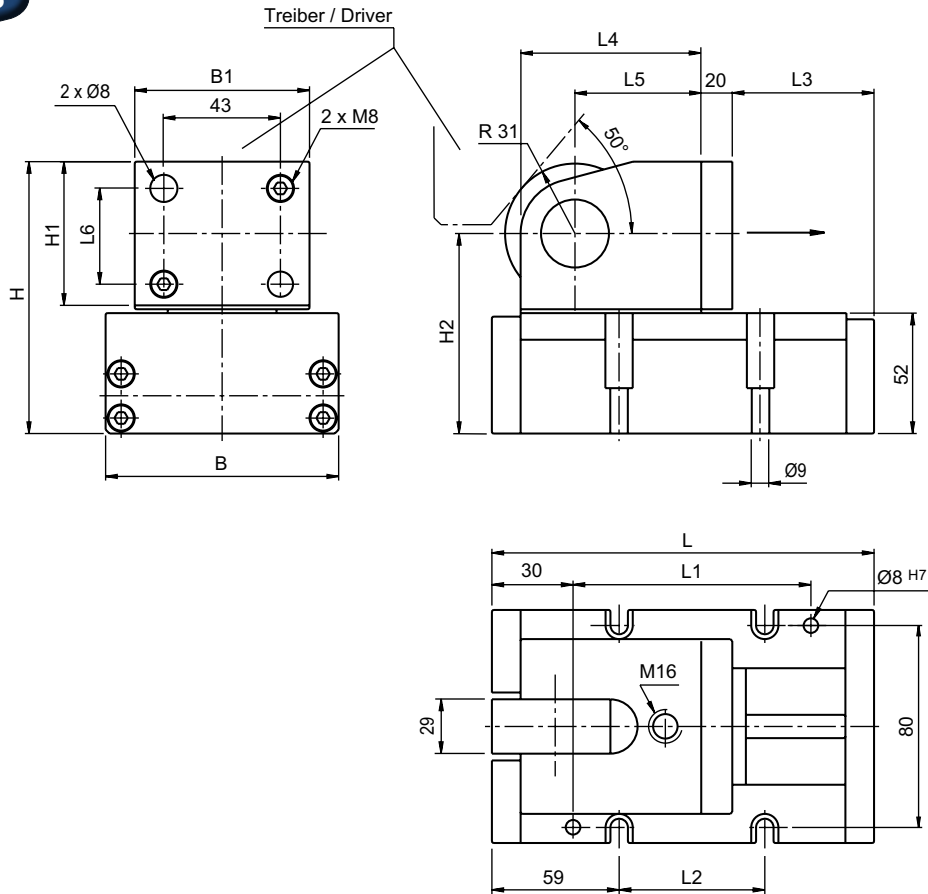


**NCC.5.1**

Empfohlener max. Hub:  
 NCC.5.1.1: 45 mm  
 NCC.5.1.2: 72 mm  
 NCC.5.1.3: 90 mm

Recommended max stroke:  
 NCC.5.1.1: 45 mm  
 NCC.5.1.2: 72 mm  
 NCC.5.1.3: 90 mm

 **NCC.5.1.1**



| Type      | Hub Stroke | B  | B1 | H   | H1 | H2  | L   | L1  | L2  | L3 | L4  | L5  | L6 | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|-----------|------------|----|----|-----|----|-----|-----|-----|-----|----|-----|-----|----|---|---------------------------------------|---------------------------------------|
| NCC.5.1.1 | 50         | 94 | 63 | 117 | 63 | 86  | 190 | 134 | 76  | 73 | 85  | 66  | 43 | 3000                                      | 200                                   | NC.054.00.00200.050                   |
| NCC.5.1.2 | 80         | 94 | 63 | 117 | 63 | 86  | 220 | 164 | 106 | 73 | 115 | 96  | 43 | 3000                                      | 200                                   | NC.054.00.00200.080                   |
| NCC.5.1.3 | 100        | 94 | 63 | 141 | 87 | 110 | 260 | 204 | 146 | 73 | 155 | 136 | 67 | 3000                                      | 200                                   | NC.054.00.00200.100                   |

[TH]

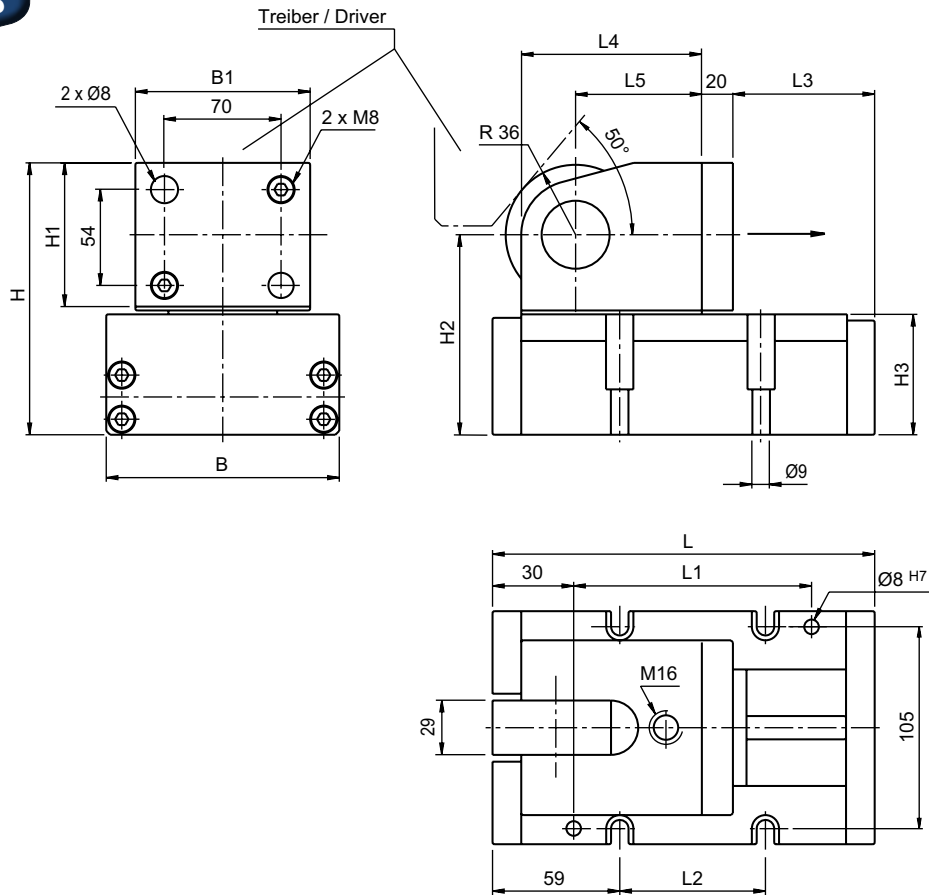


**NCC.5.2**

Empfohlener max. Hub:  
 NCC.5.2.1: 45 mm  
 NCC.5.2.2: 72 mm  
 NCC.5.2.3: 90 mm

Recommended max stroke::  
 NCC.5.2.1: 45 mm  
 NCC.5.2.2: 72 mm  
 NCC.5.2.3: 90 mm

**NCC.5.2.1**



| Type             | Hub Stroke | B   | B1 | H   | H1 | H2  | H3 | L   | L1  | L2  | L3 | L4  | L5  | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|------------------|------------|-----|----|-----|----|-----|----|-----|-----|-----|----|-----|-----|---|---------------------------------------|---------------------------------------|
| <b>NCC.5.2.1</b> | 50         | 120 | 90 | 140 | 74 | 103 | 62 | 190 | 134 | 76  | 73 | 85  | 61  | 5000                                      | 200                                   | NC.054.00.00200.050                   |
| <b>NCC.5.2.2</b> | 80         | 120 | 90 | 140 | 74 | 103 | 62 | 220 | 164 | 106 | 73 | 115 | 91  | 5000                                      | 200                                   | NC.054.00.00200.080                   |
| <b>NCC.5.2.3</b> | 100        | 120 | 90 | 157 | 74 | 120 | 72 | 260 | 204 | 146 | 73 | 155 | 131 | 5000                                      | 200                                   | NC.054.00.00200.100                   |

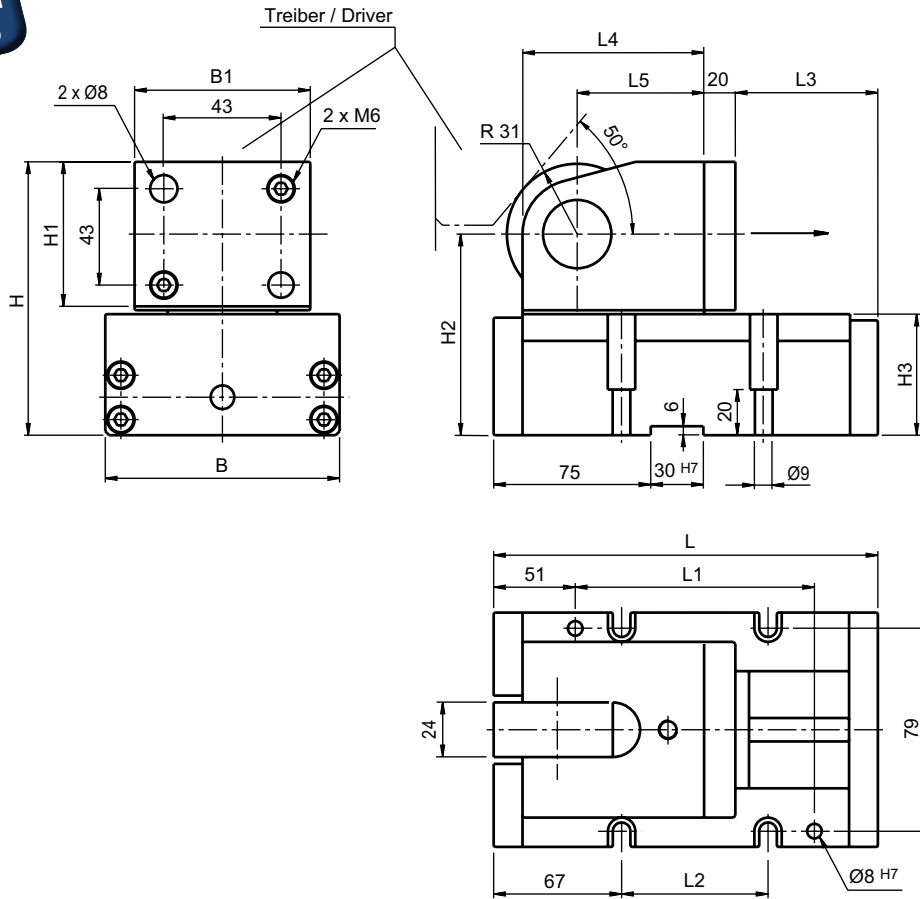


**NCC.6.1**

Empfohlener max. Hub:  
 NCC.6.1.1: 45 mm  
 NCC.6.1.2: 72 mm

Recommended max stroke:  
 NCC.6.1.1: 45 mm  
 NCC.6.1.2: 72 mm

**NCC.6.1.1**



| Type      | Hub Stroke | B  | B1 | H   | H1 | H2 | H3 | L   | L1  | L2 | L3 | L4  | L5 | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|-----------|------------|----|----|-----|----|----|----|-----|-----|----|----|-----|----|---|---------------------------------------|---------------------------------------|
| NCC.6.1.1 | 50         | 94 | 63 | 117 | 63 | 86 | 52 | 190 | 88  | 56 | 43 | 115 | 96 | 3000                                      | 200                                   | NC.054.00.00200.050                   |
| NCC.6.1.2 | 80         | 94 | 63 | 117 | 63 | 86 | 52 | 220 | 118 | 86 | 73 | 115 | 96 | 3000                                      | 200                                   | NC.054.00.00200.080                   |

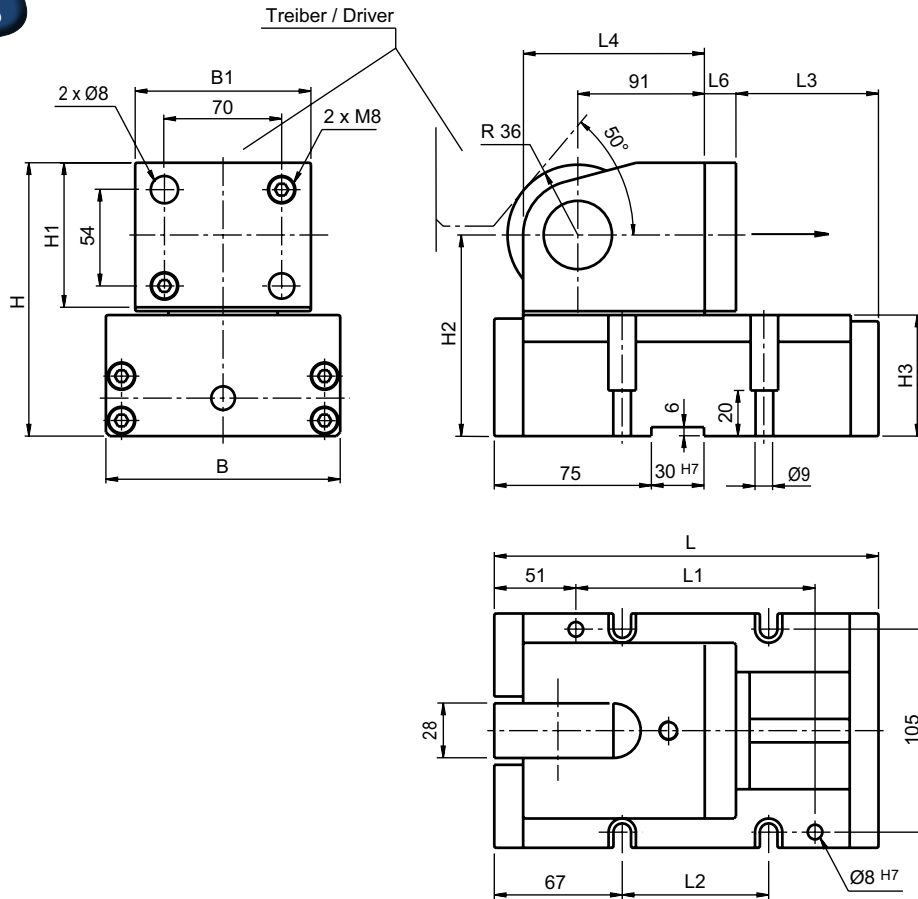
[TH]

**NCC.6.2**

Empfohlener max. Hub:  
 NCC.6.2.1: 45 mm  
 NCC.6.2.2: 72 mm  
 NCC.6.2.3: 90 mm

Recommended max stroke::  
 NCC.6.2.1: 45 mm  
 NCC.6.2.2: 72 mm  
 NCC.6.2.3: 90 mm

**NCC.6.2.1**



| Type             | Hub Stroke | B   | B1 | H   | H1 | H2  | H3 | L   | L1  | L2  | L3  | L4  | L6 | Schneidkraft<br>Cutting force<br>daN max. | Rückstellkraft<br>Return force<br>daN | Type<br>Gasdruckfedern<br>Gas springs |
|------------------|------------|-----|----|-----|----|-----|----|-----|-----|-----|-----|-----|----|---|---------------------------------------|---------------------------------------|
| <b>NCC.6.2.1</b> | 50         | 120 | 90 | 140 | 74 | 103 | 62 | 190 | 88  | 56  | 43  | 115 | 20 | 5000                                      | 200                                   | NC.054.00.00200.050                   |
| <b>NCC.6.2.2</b> | 80         | 120 | 90 | 140 | 74 | 103 | 62 | 220 | 118 | 86  | 73  | 115 | 20 | 5000                                      | 200                                   | NC.054.00.00200.080                   |
| <b>NCC.6.2.3</b> | 100        | 120 | 90 | 157 | 74 | 120 | 79 | 260 | 158 | 126 | 103 | 115 | 30 | 5000                                      | 200                                   | NC.054.00.00200.100                   |



Die druckluftbetriebenen Teileförderer aus dem Hause NitroCyl wurden speziell zum schnellen und sicheren Abtransport von Stanzteilen und Stanzabfällen entwickelt. Durch die kompaktere Bauweise der Teileförderer gegenüber Transportbändern

gelingt es auch auf engstem Raum, Teile automatisch abzuleiten. Der Anwender muss den Teileförderer einfach in den vorhandenen Bereich montieren und mit der benötigten Transportrinne bestücken.

The NitroCyl part conveyors, driven by compressed air, were specifically designed for the quick and reliable transportation of sheet metal parts (and scrap) out of the die. Due to their more compact design (compared with belt-conveyors), they allow to work

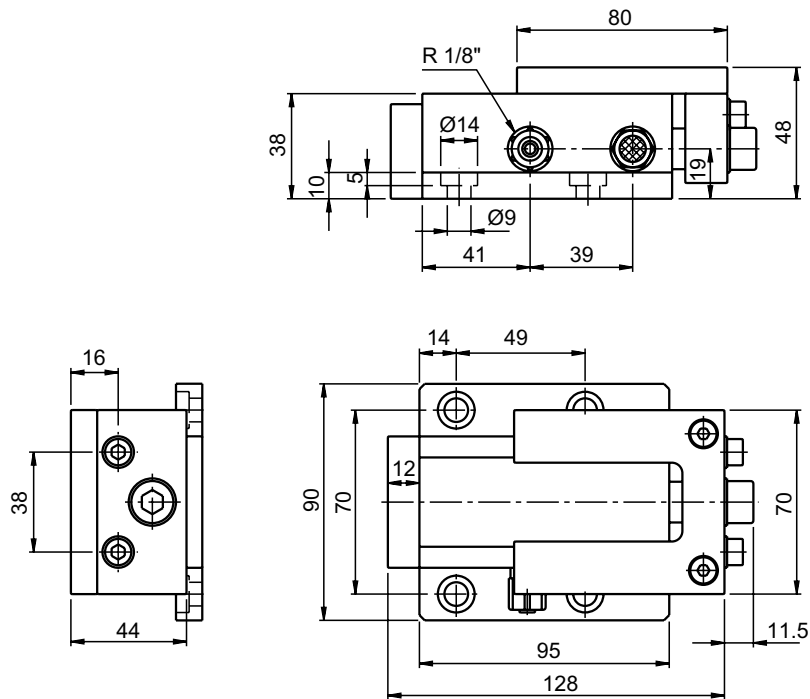
even in areas with limited space. The user simply has to fit the unit into the desired spot and equip it with the transport channel.

**NCV.1.6.30**

Auf Wunsch ist ein Elektro-Timer (E-Timer) erhältlich. Dieser sorgt z.B. bei Luftdruckschwankungen für einen störungsfreien Betrieb des Teileförderers.

Electrical Timer (E-Timer) available upon request. This unit provides an uninterrupted performance of the conveyor, even at times of uneven air-pressure-supplies.

 **NCV.1.6.30**



| Medium     | Arbeitsdruck<br>Working pressure<br>[bar] | Max. Hub<br>Max. Stroke<br>[mm] | Empf. Neigung in Transportrichtung<br>Recommended inclination<br>in transport-direction | Max. Belastbarkeit<br>Max. load capacity<br>[kg] |
|------------|---|---------------------------------|---|--|
| Luft / Air | 4 / 6                                     | 30                              | 6°  | 6  |

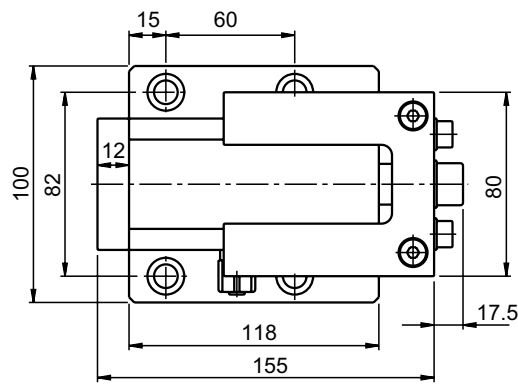
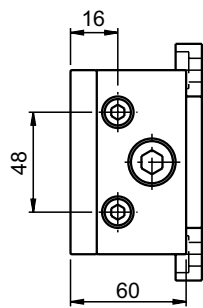
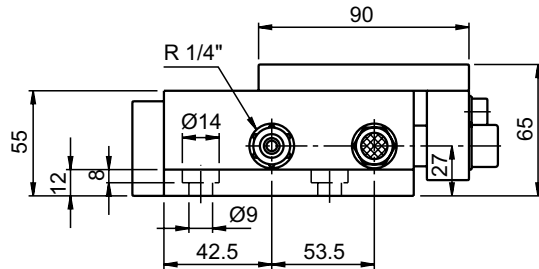
[TH]

**NCV.2.14.33**

Auf Wunsch ist ein Elektro-Timer (E-Timer) erhältlich. Dieser sorgt z.B. bei Luftdruckschwankungen für einen störungsfreien Betrieb des Teileförderers.

Electrical Timer (E-Timer) available upon request. This unit provides an uninterrupted performance of the conveyor, even at times of uneven air-pressure-supplies.

**NCV.2.14.33**



| Medium     | Arbeitsdruck<br>Working pressure<br>[bar] | Max. Hub<br>Max. Stroke<br>[mm] | Empf. Neigung in Transportrichtung<br>Recommended inclination<br>in transport-direction | Max. Belastbarkeit<br>Max. load capacity<br>[kg] |
|------------|---|---------------------------------|---|--|
| Luft / Air | 4 / 6                                     | 33                              | 6°  | 14   |

[TH]

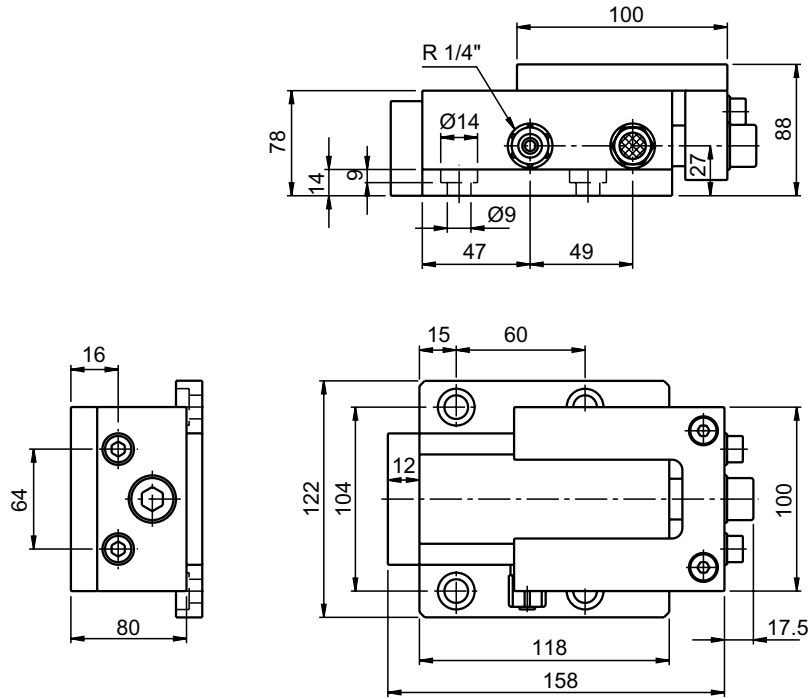


**NCV.3.36.20**

Auf Wunsch ist ein Elektro-Timer (E-Timer) erhältlich. Dieser sorgt z.B. bei Luftdruckschwankungen für einen störungsfreien Betrieb des Teileförderers.

Electrical Timer (E-Timer) available upon request. This unit provides an uninterrupted performance of the conveyor, even at times of uneven air-pressure-supplies.

 **NCV.3.36.20**



| Medium     | Arbeitsdruck<br>Working pressure<br>[bar] | Max. Hub<br>Max. Stroke<br>[mm] | Empf. Neigung in Transportrichtung<br>Recommended inclination<br>in transport-direction | Max. Belastbarkeit<br>Max. load capacity<br>[kg] |
|------------|---|---------------------------------|---|--|
| Luft / Air | 4 / 6                                     | 20                              | 6°  | 36   |

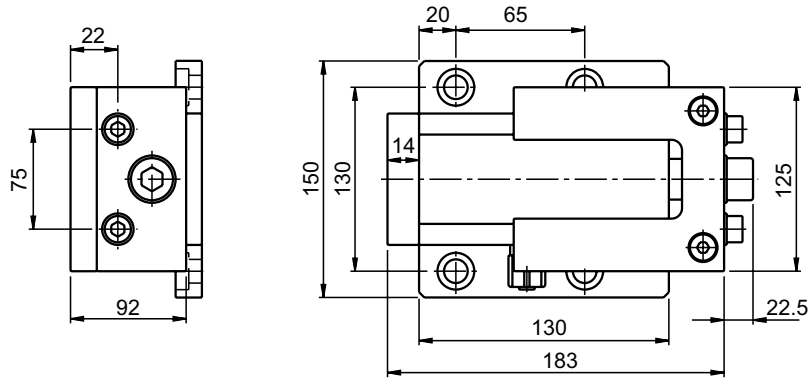
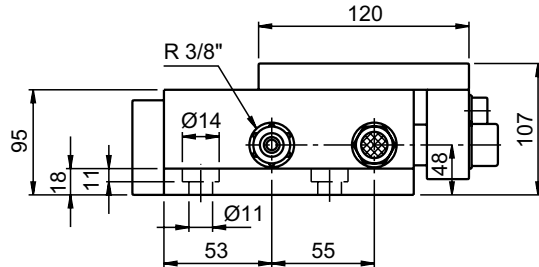
[TH]

**NCV.4.56.28**

Auf Wunsch ist ein Elektro-Timer (E-Timer) erhältlich. Dieser sorgt z.B. bei Luftdruckschwankungen für einen störungsfreien Betrieb des Teileförderers.

Electrical Timer (E-Timer) available upon request. This unit provides an uninterrupted performance of the conveyor, even at times of uneven air-pressure-supplies.

**NCV.4.56.28**



| Medium     | Arbeitsdruck<br>Working pressure<br>[bar] | Max. Hub<br>Max. Stroke<br>[mm] | Empf. Neigung in Transportrichtung<br>Recommended inclination<br>in transport-direction | Max. Belastbarkeit<br>Max. load capacity<br>[kg] |
|------------|---|---------------------------------|---|--|
| Luft / Air | 4 / 6                                     | 28                              | 6°  | 56   |

[TH]






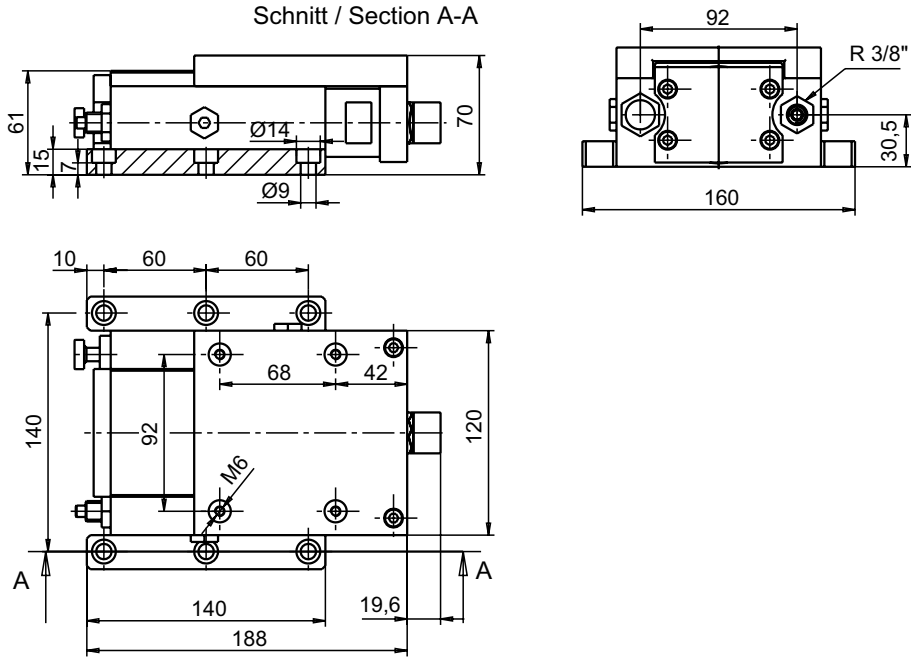
**NCV.5.36.20**

Auf Wunsch ist ein Elektro-Timer (E-Timer) erhältlich. Dieser sorgt z.B. bei Luftdruckschwankungen für einen störungsfreien Betrieb des Teileförderers.

Electrical Timer (E-Timer) available upon request. This unit provides an uninterrupted performance of the conveyor, even at times of uneven air-pressure-supplies.

 **NCV.5.36.20**

Schnitt / Section A-A

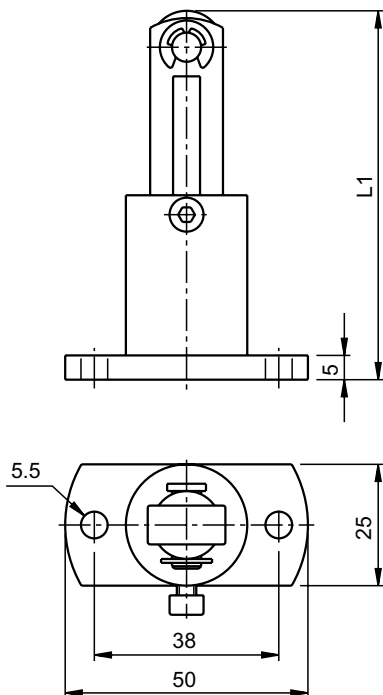


| Medium     | Arbeitsdruck<br>Working pressure<br>[bar] | Max. Hub<br>Max. Stroke<br>[mm] | Empf. Neigung in Transportrichtung<br>Recommended inclination<br>in transport-direction | Max. Belastbarkeit<br>Max. load capacity<br>[kg] |
|------------|---|---------------------------------|---|--|
| Luft / Air | 4 / 6                                     | 20                              | 6°  | 36   |

[TH]

NCVA

NCVA.1



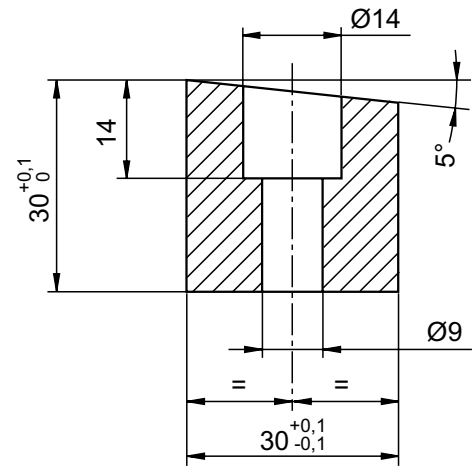
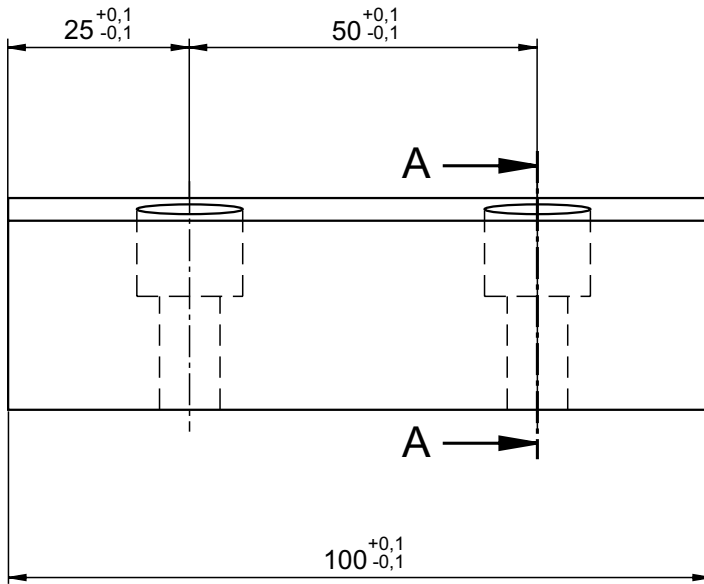
| Type | Hub Stroke [mm] | L1 min. | L1 max. |
|------|-----------------|---------|---------|
| 1    | 12,5            | 38,5    | 51      |
| 2    | 25,0            | 51,0    | 76      |
| 3    | 50,0            | 76,0    | 126     |

[TH]



NCVA.4

 NCVA.4



**Aufbau Transport-Rinne**

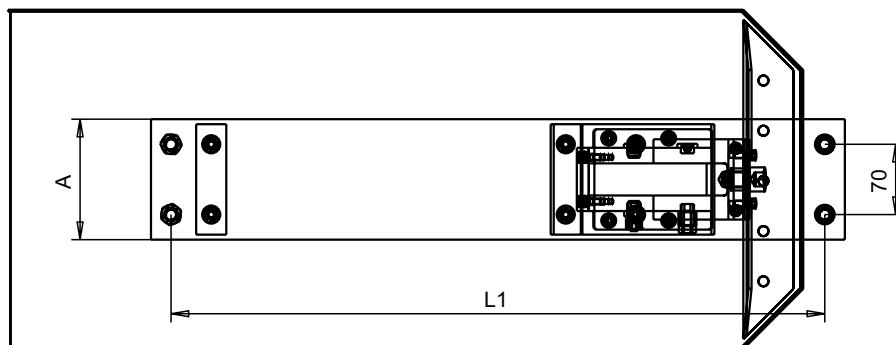
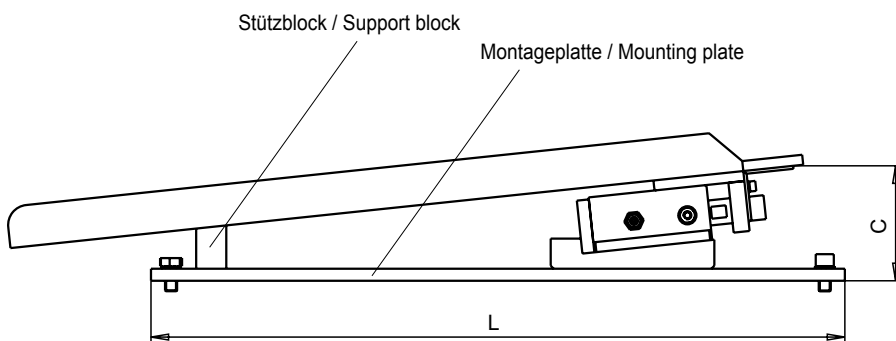
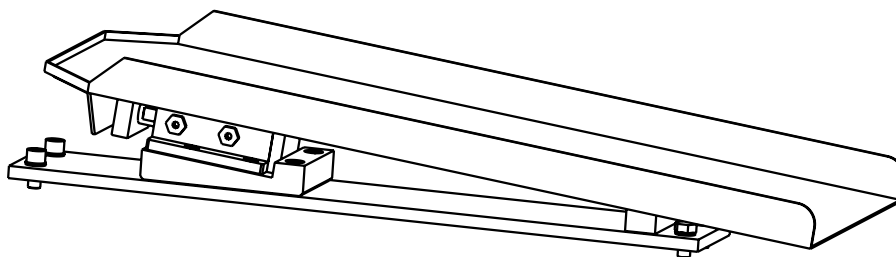
Dies sind die verfügbaren Standard-Abmessungen. Bei Applikationen mit kleineren Abmessungen können sowohl die Montage-Platte, wie auch

die Transport-Rinne gekürzt werden. Bei größeren Abmessungen müssen die Höhen der Rinnen-Stützen verändert werden

**Design of the transport-channel**

These are the available standard sizes. Running applications with smaller dimensions, both the mounting plate and the transport channel

can be cut. If larger dimensions are needed, the heights of the channel support have to be altered.



| für Type /<br>for type |        | C<br>(Maß ohne Rinne)<br>(Distance without channel) | A   | L1   |
|------------------------|--------|---|-----|------|
| NCV.1...               | 496,0  | 97,0  | 110 | 456  |
| NCV.2...               | 691,0  | 116,0   | 120 | 651  |
| NCV.3...               | 911,0  | 140,0   | 142 | 871  |
| NCV.4...               | 1125,0 | 162,0   | 170 | 1085 |
| NCV.5...               | 911,0  | 123,0   | 142 | 871  |

**Aufbau Transport-Rinne**

1. Mit Hilfe der Montageplatte können Teileförderer in engen und schwer zugänglichen Pressen-Bereichen sicher montiert werden
2. Wird die Montageplatte einbau-abhängig gekürzt, ändert sich die Höhe der Stützen.
3. Die angegebenen Längen der

Montageplatten sind Beispiele. Bei größeren Abmessungen verändert sich die Höhe der Stütze, wobei der Arbeitswinkel von 6° bestehen bleibt.

$$\Delta C = (\text{neue Länge} - \text{alte Länge}) \times \tan 6^\circ$$

( $\Delta C$  = Höhenveränderung)

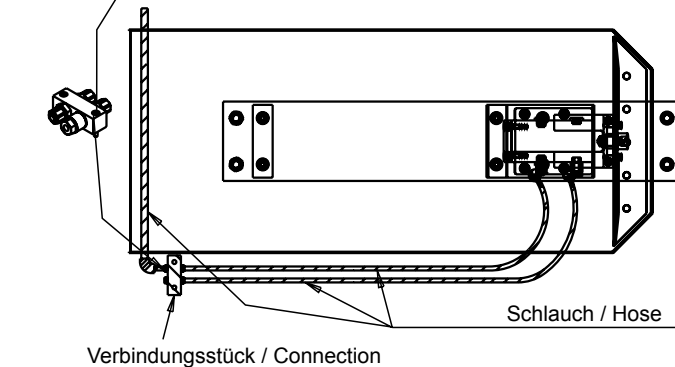
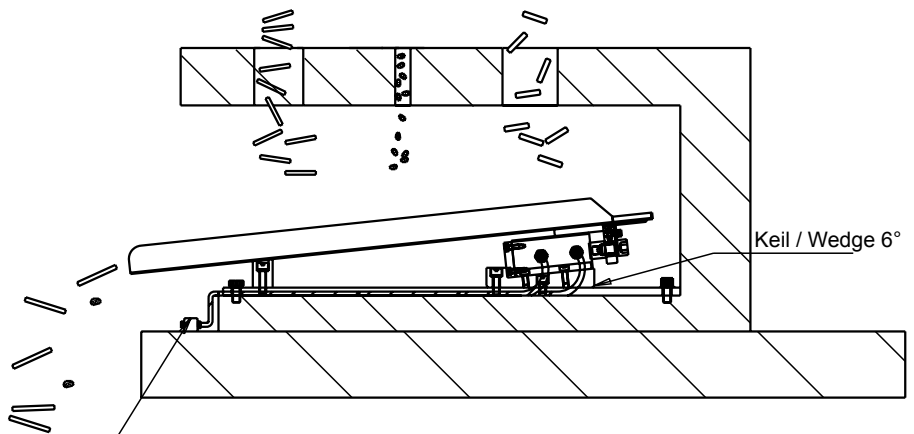
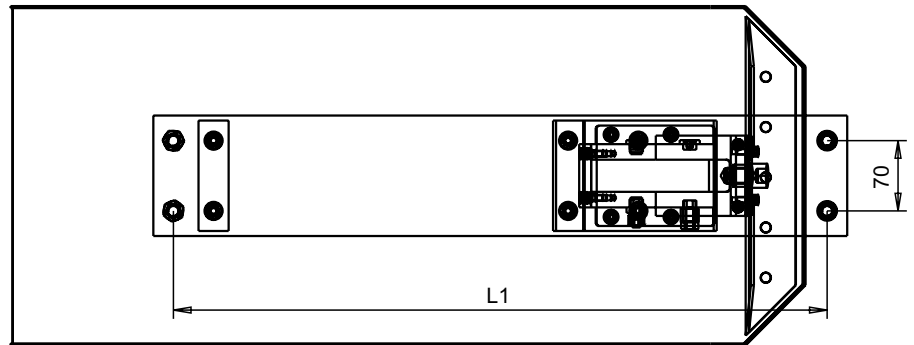
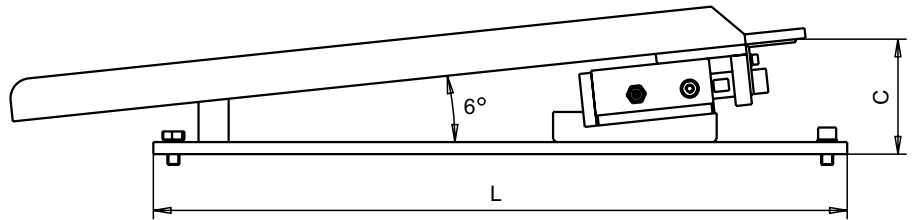
**Design of the transport-channel**

1. Using the mounting-plate the conveyor can be safely fixed, even in narrow and difficult to reach areas in the die and press.
2. If due to the application the mounting plate needs to be shortened, the support height changes.
3. The measurements of the shown

mounting plates are examples only. With their increasing sizes the height of the supports changes, keeping the working angle at 6°.

$$\Delta C = (\text{new length} - \text{old length}) \times \tan 6^\circ$$

( $\Delta C$  = height alteration)



Schlauch - $\phi$ :  
für Type NCV.1 und NCV.2:  $\phi = 6$  mm  
für Type NCV.3, NCV.4 u. NCV.5:  $\phi = 8$  mm

Hose - $\phi$ :  
für Type NCV.1 and NCV.2:  $\phi = 6$  mm  
für Type NCV.3, NCV.4 u. NCV.5:  $\phi = 8$  mm

[TH]

**Aufbau Transport-Rinne**

1. Die Montage-Platte kann durch Hilfsmittel (Leisten / Platten usw.) an Werkzeug oder Presse befestigt werden.
2. Das Befestigen der Transport-Rinne mit dem Teileförderer erfolgt mittels eines Winkels, welcher mit der Rinne verschweißt wird. Jetzt kann die Rinne mit dem Teileförderer verschraubt werden. Achten Sie darauf, dass Winkel und Rinne ausreichend verschweißt sind.

3. Die Ablaufseite (vorn) sollte abgewinkelt werden, um einen Stau der Stanzabfälle zu vermeiden.
4. Durch Anbringen von z. B. Moosgummi zwischen den Stützen und dem Teileförderer kann Lärm minimiert werden.

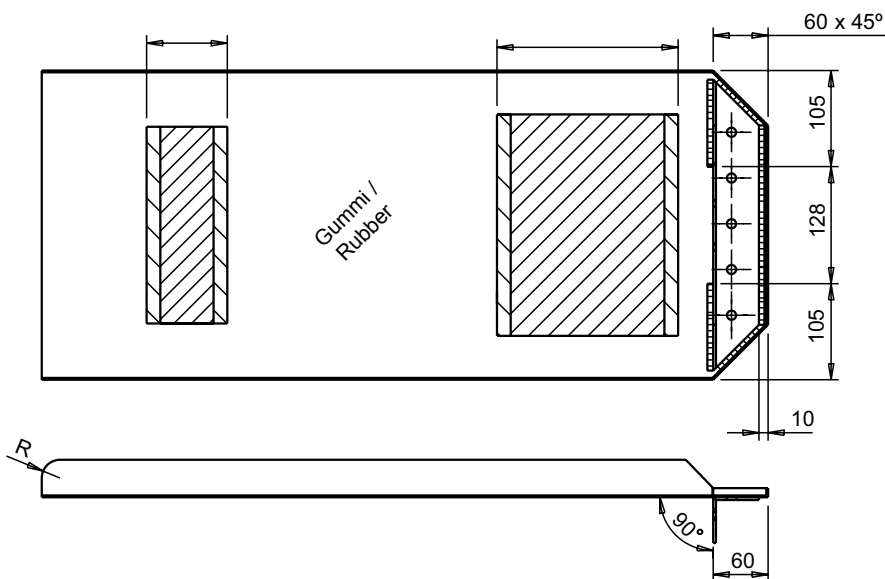
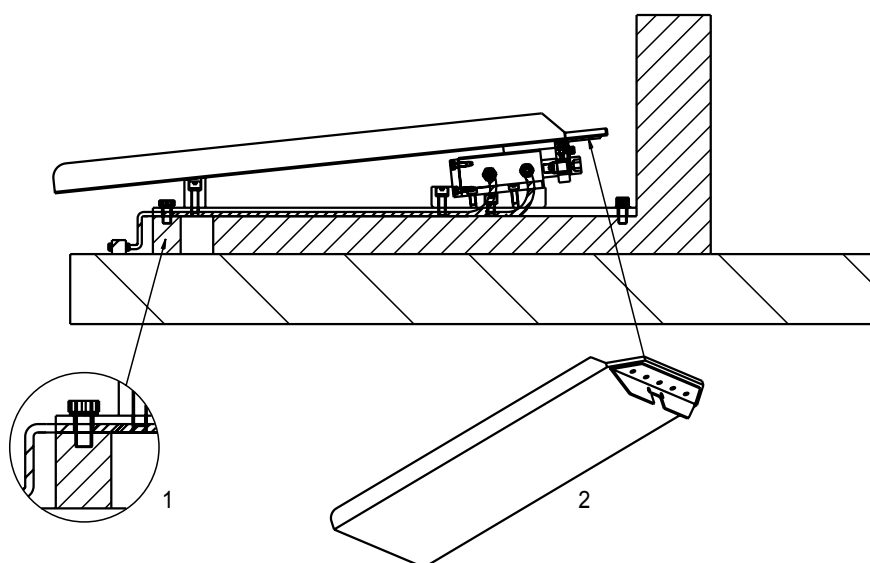
Wir liefern keine fertigen Transport-Rinnen, können Ihnen aber das Grundmaterial und konstruktive Hilfe bieten.

**Design of the transport-channel**

1. The mounting plate can, if needed, be fixed to the die or press by means of supporting plates or bars.
2. An elbow-connector, welded to the transport channel, fixes it to the conveyor body ... afterwards these two parts are additionally screwed together.
3. The discharging end of the channel should be bent to avoid a congestion of the scrap.

4. Cellular rubber put in between the supports and the conveyor does reduce noise.

We do not supply ready-to-use transport channels, but offer the basis material and support during design.



[TH]

**Befestigung**

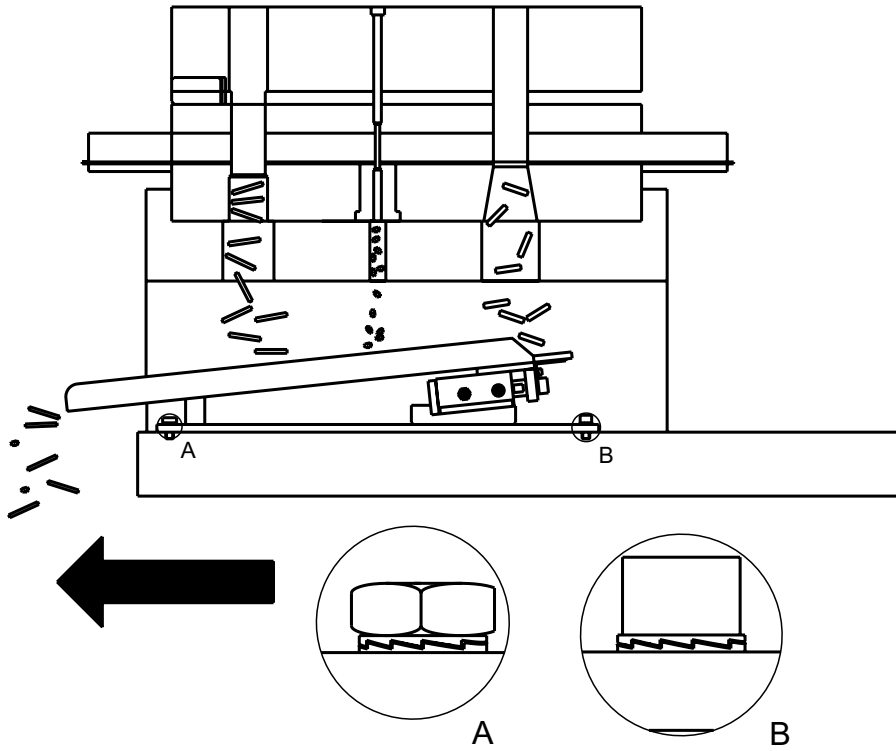
Befestigen Sie den Teileförderer mit 2 Stück Sechskantschrauben (vorn) und mit 2 Stück Innensechskantschrauben (hinten) am Werkzeug

oder der Presse. Selbsthemmende oder Federscheiben verhindern ein vibrationsbedingtes Lösen.

**Mounting**

Mount the part conveyor with 2 hexagon head screws ( front ) and 2 Allen screws (back) to the die or the press.

Self-locking screws or spring disks avoid loosening based on vibration.



**Luftanschluss**

Der Arbeitsdruck der Teileförderer liegt bei 4-6 bar. Obwohl üblicherweise 6-7 bar zur Verfügung stehen, müsste im Einsatzfall überprüft werden, inwieweit bei Anschluss mehrerer Teileförderer der System-Druck abfällt.

Es ist daher zu empfehlen, die einzelnen Teileförderer nicht in Reihe, sondern parallel zu schalten und jeden Teileförderer mit einem Manometer zu bestücken, um sicher zu stellen, dass jeder Förderer mit dem benötigten Arbeitsdruck beaufschlagt wird. Sollte bei einzelnen Teileförderern der benötigte Arbeitsdruck nicht zur Verfügung

stehen, muss der Durchmesser der entsprechenden Zuleitung vergrößert werden.

1. Das Luftdruck-System muss mit einer Wartungseinheit ausgerüstet sein, die Kondensation vermeidet. Diese „Trockner-Funktion“ ist ein MUSS um Oxidation auszuschließen.
2. Des Weiteren muss über diese Wartungseinheit Öl zugeführt werden können, welches den Teileförderer schmiert. Das gewählte Öl sollte eine niedrige Viskosität aufweisen.

**Air supply**

The conveyors run with a working pressure of 4-6 bar. Although usually compressed air systems provide around 6-7 bar it has to be checked, whether it still allows the connection of multiple conveyors to one system.

We therefore do recommend, to not align the conveyors in series, but parallelly and equip each one with a manometer, thereby making sure, that each unit runs on the required working pressure. If needed, the diameter of the pressure supplying hoses has to be enlarged.

1. The air system must be equipped with a air maintenance unit to avoid condensation. This dryer-function is a MUST.
2. The maintenance system must have the possibility to provide a low viscosity oil to grease the conveyor.

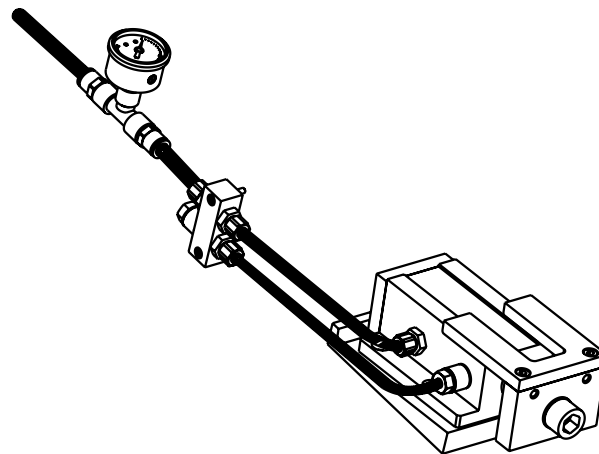


Tabelle für min. Außen-Ø der Luftschläuche / Table showing minimal outside diameters of air hoses

| für Type /<br>for type | Anzahl Teileförderer /<br>Number of part conveyor |    |    |    |    |    |
|------------------------|---|----|----|----|----|----|
|                        | 1   | 2  | 3  | 4  | 5  | 6  |
| NCV.1...               | 6   | 10 | 12 | 12 | 14 | 16 |
| NCV.2...               | 6   | 10 | 12 | 12 | 14 | 16 |
| NCV.3...               | 8   | 12 | 14 | 16 | 18 | 20 |
| NCV.4...               | 8   | 12 | 14 | 16 | 18 | 20 |
| NCV.5...               | 8   | 12 | 14 | 16 | 18 | 20 |



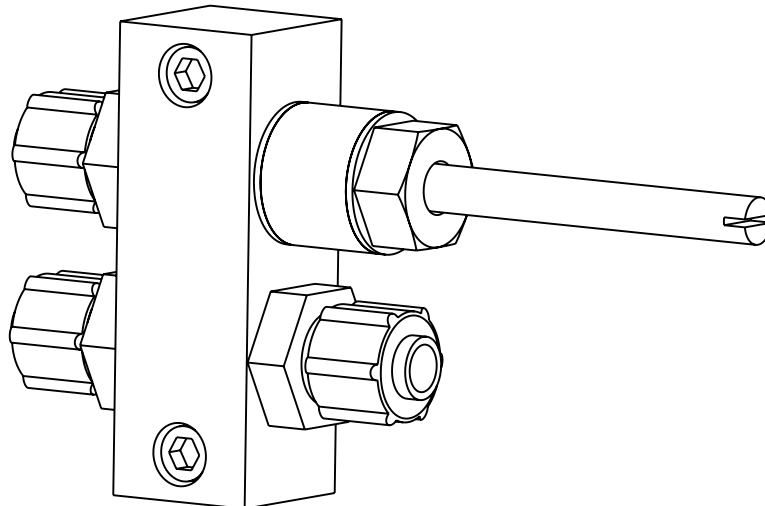


**Hinweise**

1. Um die beste Leistung zu erzielen, sollte die Drossel weit genug geöffnet sein.
2. Bevor Sie die Teileförderer an das Luftdrucksystem anschließen, überprüfen Sie noch einmal alle Verbindungen.
3. Sollte der Teileförderer nur eine Hubbewegung machen und dann stehen, überprüfen Sie die Drossel. In den meisten Fällen ist die Drossel zu weit geschlossen. Der Teileförderer muss bei geöffneter Drossel einwandfrei funktionieren.
4. Sollte der Teileförderer bei geringem Gegendruck oder nach wenigen Hubbewegungen still stehen, ist der eingehende Luftdruck wahrscheinlich zu gering (unter 5 bar). Bitte beachten Sie, ob am Werkzeug oder der Maschine eventuell weitere Luftabnehmer vorhanden sind, welche zur Druckminimierung führen können.
5. Es ist darauf zu achten, dass es zwischen dem Teileförderer und dem Werkzeug, der Maschine oder anderen Teilen nicht zu Berührung kommt.
6. Wichtig ist, dass die Transportrinne richtig abgestützt ist, um ein Hüpfen zu vermeiden.

**Notice:**

1. For best results, fully open air regulator.
2. Before connecting the conveyor to the air-pressure system, please double-check all junctions.
3. In case the conveyor moves just one stroke and stops, please check the air regulator. In most cases it has not been opened wide enough. After opening the regulator it should work fine.
4. In case the conveyor does not operate with no obvious overload or after only a few strokes, the working pressure might be too low ( under 5 bar ). Please check, whether there are more pressure consuming devices hooked to the same air-system.
5. Please make sure, that the conveyor can work freely, and there is no contact between it and the die, the machine or any other parts.
6. Important: the transport channel needs to be properly supported to avoid bouncing.



Hinweise

1. Achten Sie darauf, dass keine Kontaktpunkte zwischen der Transport-Rinne, dem Werkzeug und der Maschine oder sonstigen Anbauten bestehen. Es könnte sonst der Fall eintreten, dass der Teileförderer in seiner Hub-Bewegung gestoppt wird. Das gleiche könnte geschehen, wenn einzelne Abfallstücke zwischen der Transport-Rinne und Werkzeug oder andere Anbauten gelangen. Unterbinden Sie diese Möglichkeit durch so genannte Abfall-Leitbleche.
2. Bitte verlegen Sie die Druckluft-Zuleitung so, dass keine Berüh-

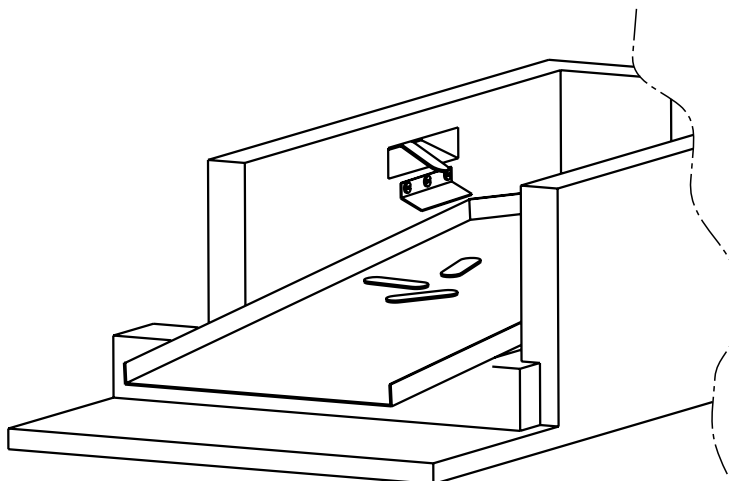
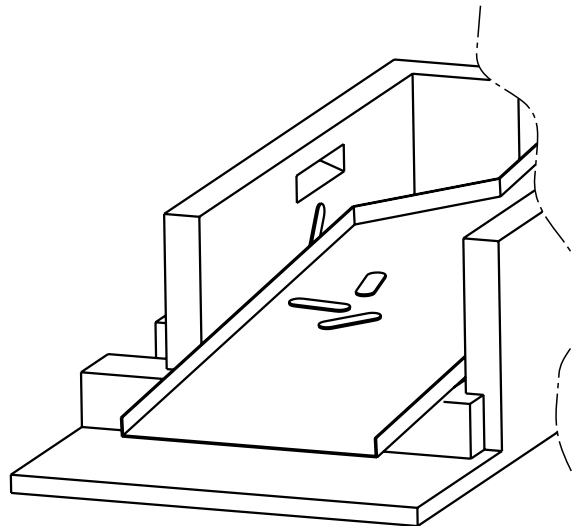
rung zwischen der Transport-Rinne und den Schläuchen besteht. Wird das Zuleitungs-System beschädigt, kommt es zum Druckverlust, was zu einem Funktions-Ausfall führt. „Also keine Produkt-Fertigung“.

Es muss sichergestellt sein, dass keine Abfälle zwischen die Transport-Rinne und das Werkzeug bzw. die Anbauten gelangen können, da dies zum Ausfall / Stillstand des Teileförderers führen kann. Montieren Sie daher (wie dargestellt) kleine Leitbleche.

Notice:

1. Make sure, there is no contact between the transport channel and the die, respectively the machine, which could result in stopping the transporter. The same could be caused by waste falling of the channel into spaces between the transporter and the die. This can be avoided using little waste-guiding metal sheets.
2. Please install hoses for compressed air in a way that there is no contact between the transport channel and the hoses. If the hose-system leaks, air-pressure will vanish, shutting down the whole unit.

It is important, that no scrap can fall between spaces between the conveyor and the die / the machine, since that could result in a failure of the unit.  
Please provide small scrap-sheets

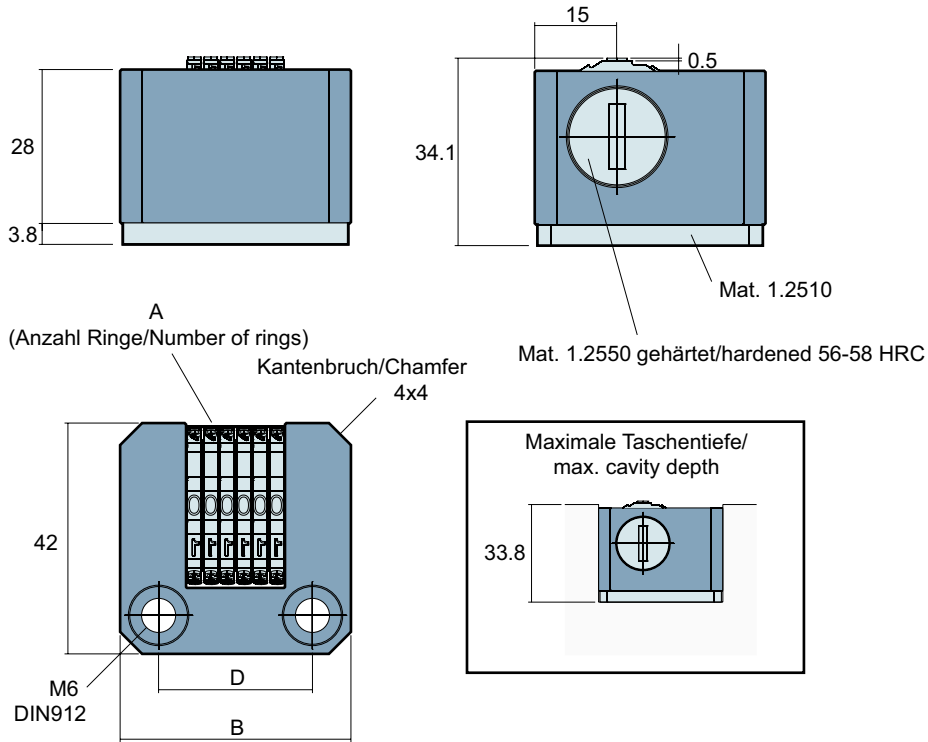


**TH 926**

Mat.: 42CrMo4

Mat.: 42CrMo4

 **TH 926 / 04**



| A  | B  | D  |
|----|----|----|
| 04 | 36 | 22 |
| 06 | 42 | 28 |

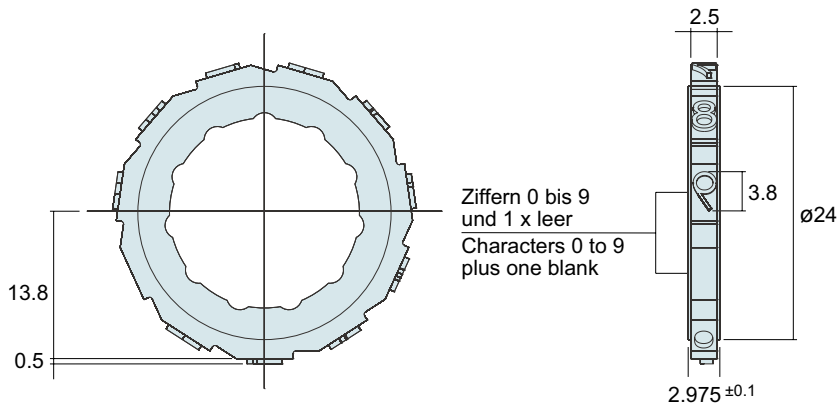
[TH]

TH 927

Mat.: 1.2379  
Härte: 56 - 59 HRC

Mat.: 1.2379  
Hardness: 56 - 59 HRC

TH 927



[TH]



Kompakte, tragbare Handstempelgeräte für die Kennzeichnung von Körnerpunkten, Kontrollstempelungen, Nummerierungen, Werkerkennzahlen etc.

Die Geräte können sowohl als Handstempelwerkzeuge als auch als Einbaueinheiten in Kontrollstationen, Fertigungslinien etc. verwendet werden.

Die Handhabung der Geräte ist äußerst einfach und kann ohne Kraftaufwendung erfolgen. Die Prägeleistung ist über einen Druckregler feineinstellbar.

Schnellwechselbare Stempelsätze in unterschiedlichsten Schriftgrößen, wie Zahlen- und/oder Buchstabenstempel, Kontrollstempel, Körnerspitzen etc. in Standard- und Sonderausführungen ermöglichen ein weites Einsatzgebiet für die dauerhafte Werkstückkennzeichnung.



TH 930

TH 931

TH 932

The hand-held stamping tools are suitable for a variety of uses such as centre marking, identification stamping, numbering and process control marking.

They are usable as hand held tools or integrated units. These units are easy to use for flexible applications

Following major advantages:

- no manual force required
- constant high impact force, adjusted by adjusting of air pressure

Stamps may be changed within seconds. Typical applications for these devices are stamping inspection and control characters, CE marks and other smaller marks.

### Ausführungsbeispiele / Application area:

TH 930 mit kleinem Typenhalter/ Einzeltypen /  
TH 930 with a small type holder



TH 931 mit Zapfenstempel /  
TH 931 with pin stamp



TH 932 mit handeinstellbarem Prägwerk /  
TH 932 with manual indexing numbering head



**TH 930**  
**TH 931**  
**TH 932**

Druckluftbedarf: 2 - 6 bar  
Schlauchanschluss: G1/8"

Air pressure: 2 - 6 bar  
Air tube connector: G1/8"

 **TH 930**



**Technische Daten / Technical Data:**

| Type          | Gesamtlänge<br>Length<br>[mm] | Gewicht<br>Weight<br>[g] | Werkzeugaufnahme<br>Tooling fixture<br>[mm] | Stempelleistung<br>Impact force<br>[kJ] |
|---------------|-------------------------------|--------------------------|---|---|
| <b>TH 930</b> | ~ 260                         | 800                      | 8   | ~ 10                                    |
| <b>TH 931</b> | ~ 300                         | 1200                     | 10  | ~ 20                                    |
| <b>TH 932</b> | ~ 350                         | 1900                     | 10*   | ~ 35                                    |

\* = Spannzange

Maximal mögliche Stempelleistung bei Einsatz von Typenhaltern mit Einzeltypen oder Standard-Stempeleinsatz:  
Maximum marking force (These information are rough standard values. Exact information can only be made after a sample marking with an original workpiece):

| Schrifthöhe<br>Character Height<br>[mm] | max. Anzahl Prägestellen / max. numbers of characters |               |               |                                 |               |               |
|---|---|---------------|---------------|---------------------------------|---------------|---------------|
|   | Mat.: Alu / Aluminium                                 |               |               | Mat.: St (ST 37) / Steel (St37) |               |               |
|   | <b>TH 930</b>   | <b>TH 931</b> | <b>TH 932</b> | <b>TH 930</b>                   | <b>TH 931</b> | <b>TH 932</b> |
| 1                                       | 5   | 6             | 8             | 3                               | 4             | 7             |
| 2                                       | 5   | 6             | 8             | 3                               | 4             | 7             |
| 3                                       | 4   | 5             | 7             | 2                               | 3             | 5             |
| 4                                       | 3   | 4             | 6             | 1                               | 2             | 4             |
| 5                                       | 2   | 3             | 6             | -                               | 1             | 3             |

Maximal mögliche Zeichenzahl auf den Standard-Stempeleinsätzen für / Max. numbers of characters on marking pin for:

**TH 930** mit / with diameter 6 mm

|                              |                         |
|------------------------------|-------------------------|
| Schrifthöhe / Character Size | 2 mm: 3 Zeichen / signs |
|                              | 3 mm: 2 Zeichen / signs |
|                              | 4 mm: 1 Zeichen / signs |

**TH 931** mit / with diameter 8 mm

|                              |                             |
|------------------------------|-----------------------------|
| Schrifthöhe / Character Size | 2 mm: 4 - 5 Zeichen / signs |
|                              | 4 mm: 2 - 3 Zeichen / signs |
|                              | 6 mm: 1 - 2 Zeichen / signs |

**TH 932** mit / with diameter 10 mm

|                              |                              |
|------------------------------|------------------------------|
| Schrifthöhe / Character Size | 3 mm: 8 - 10 Zeichen / signs |
|                              | 4 mm: 6 - 7 Zeichen / signs  |
|                              | 5 mm: 3 - 5 Zeichen / signs  |

Weitere technische Informationen auf Anfrage. / If you need more information, so please do not hesitate to contact us.



TH 933

Mat.: 1.2379  
Härte: 56 - 59 HRC

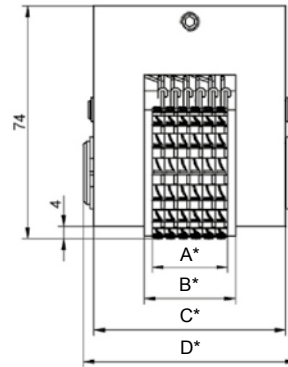
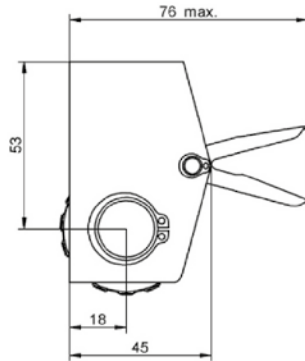
Mat.: 1.2379  
Hardness: 56 - 59 HRC

TH 933

Manuell einstellbar –  
Verstellhebel arretiert das Prägerad in  
gewünschter Position.

Manual adjustable numbering head.  
The lever lock the wheels in the  
chosen position

\* = Maßangabe erst möglich nach  
Festlegung von der Anzahl der Präge-  
räder, Schrifthöhe und Schriftform  
(Mittel/Halbgeng/Eng)



\* = Specification is only possible  
after determining number of marking  
wheels, font height and lettering  
standard (Medium-spaced, Semi  
closed-spaced, Close-spaced).



| Schrifthöhe / Character size [mm] | Radteilung / Partition of the wheel* |
|-----------------------------------|--------------------------------------|
| 1 - 4                             | 15                                   |
| 5                                 | 13                                   |
| 6                                 | 11                                   |
| 8                                 | 11                                   |

\* = verfügbare Flächen am Umfang / available surfaces on the circumference

TH 934

Mat.: 1.2379  
Härte: 56 - 59 HRC

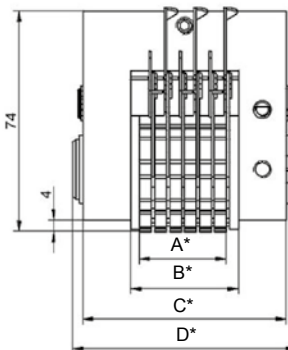
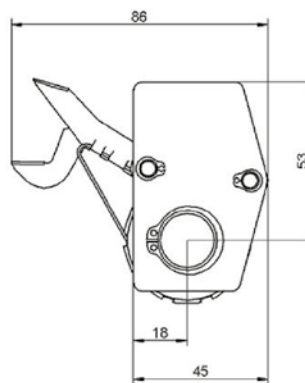
Mat.: 1.2379  
Hardness: 56 - 59 HRC

TH 934

Manuell einstellbar –  
Tasthebel ermöglicht schnelles Ver-  
stellen von Stelle zu Stelle.

Manual adjustable key numbering  
head. The adjustment of the wheels  
from position to position effects manu-  
ally though pressing the key levers

\* = Maßangabe erst möglich nach  
Festlegung von der Anzahl der Präge-  
räder, Schrifthöhe und Schriftform  
(Mittel/Halbgeng/Eng).



\* = Specification is only possible  
after determining number of marking  
wheels, font height and lettering  
standard (Medium-spaced, Semi  
closed-spaced, Close-spaced).



| Schrifthöhe / Character size [mm] | Radteilung / Partition of the wheel* |
|-----------------------------------|--------------------------------------|
| 1 - 4                             | 14                                   |
| 5                                 | 14                                   |
| 6                                 | 11                                   |

\* = verfügbare Flächen am Umfang / available surfaces on the circumference



TH 935

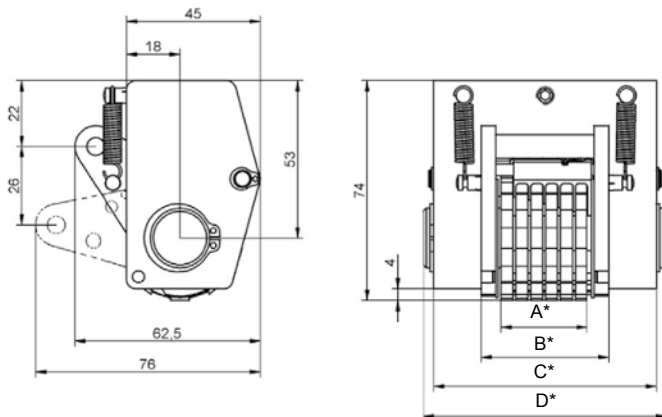
Mat.: 1.2379  
Härte: 56 - 59 HRC

Mat.: 1.2379  
Hardness: 56 - 59 HRC

TH 935

Automatisch weiterschaltend mit mechanischer Schalteinrichtung oder Pneumatikzylinder (Hub min. 25 mm) – pro Hub wird um eine Zahl weiter gezählt.

Automatic indexing numbering head. The numbering switch effects after every marking stroke



\* = Maßangabe erst möglich nach Festlegung von der Anzahl der Prägeräder, Schrifthöhe und Schriftform (Mittel/Halbeng/Eng).

\* = Specification is only possible after determining number of marking wheels, font height and lettering standard (Medium-spaced, Semi closed-spaced, Close-spaced).



| Schrifthöhe / Character size [mm] | Radteilung / Partition of the wheel* |
|-----------------------------------|--------------------------------------|
| 1 - 4                             | 10                                   |
| 5                                 | 10                                   |
| 6                                 | 10                                   |
| 8                                 | 10                                   |

\* = verfügbare Flächen am Umfang / available surfaces on the circumference

[TH]



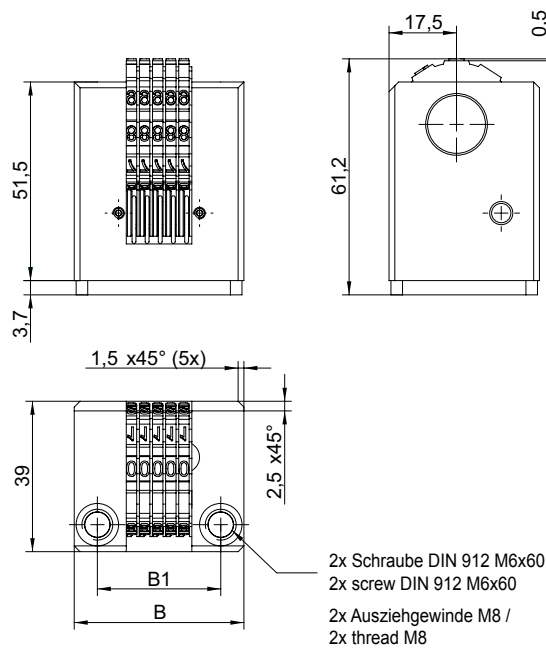


TH 936

Mat.: 1.2842

Mat.: 1.2842

TH 936 / 03 x 4



| Anzahl Prägeräder /<br>Number of wheels | Schrifthöhe /<br>Character size<br>[mm] | B  | B1 |
|---|---|----|----|
| 03                                      | 2,5                                     | 40 | 28 |
| 03                                      | 4                                       | 40 | 28 |
| 04                                      | 2,5                                     | 40 | 28 |
| 04                                      | 4                                       | 40 | 28 |
| 05                                      | 2,5                                     | 44 | 32 |
| 05                                      | 4                                       | 44 | 32 |
| 06                                      | 2,5                                     | 50 | 38 |
| 06                                      | 4                                       | 50 | 38 |
| 07                                      | 2,5                                     | 50 | 38 |
| 07                                      | 4                                       | 50 | 38 |

[TH]



# TH 010

Kaltentfetter **TH 010** entfernt Fette, Schmutz, Schmierstoffe und Umformöle. **TH 010** greift keine Metalle, Kunststoffe, Lacke, Glas oder Gummiartikel an.  
Kaltentfetter **TH 010** verdunstet sehr schnell und entwickelt keine gesundheitsschädlichen Dämpfe.  
Eingesetzt wird **TH 010** im Werkzeug-, Maschinen- und Anlagenbau zur Entfernung von Öl und Schmutz.

Sprühdose, 500 ml

The cold degreaser **TH 010** removes grease, dirt, lubrication and oils. It does not corrode metal, plastics, lacquers, glass or rubbers.  
The cold degreaser **TH 010** evaporates quickly and has no noxious effects.  
**TH 010** is used in the die- and machine building - industries to remove oil and dirt.

Aerosol can, 500 ml

# TH 010



[TH]



# TH 011

Rostlöse-Spray **TH 011** löst alle angerosteten oder festsitzende Metallteile, wie Schrauben, Bolzen oder Pressverbindungen. **TH 011** entfernt außerdem Flugrost von Metallflächen. Verschiedene Zusätze bewirken eine hohe Schmierwirkung und einen nachhaltigen Rostschutz.

Sprühdose, 400 ml

Rust remover **TH 011** removes rusty and tight metal parts, like screws, nuts or press fittings, as well as surface rust. Different additives cause a high lubricating effect and a lasting rust protection.

Aerosol can, 400 ml

# TH 011



[TH]

## TH 012

Korrosionsschutz TH 012 bildet einen wirksamen Schutzfilm auf allen Metallen, die gegen Korrosion und Rost geschützt werden müssen. Nach dem Aufsprühen von TH 012 und dem Verdunsten des Lösungsmittels verbleibt ein dünner wachsartiger Schutzfilm auf den Metallflächen. So sind die Teile vor Oxidation geschützt.

TH 012 ist nicht aggressiv und kann mit jedem Lösungsmittel entfernt werden (Kaltentfetter TH 010, Benzin oder Benzol).

Sprühdose, 400 ml

Corrosion prevention TH 012 forms an effective coat on all metals, which need to be protected against corrosion and rust. After the spray-coating and the evaporating of the solvent a thin, waxy protective film remains on the metal surface.

Therefore the parts are protected against oxidation. TH 012 is not aggressive and can be removed with every solvent (cold degreaser TH 10, petrol and benzene).

Aerosol can, 400 ml

## TH 012



# TH 013

# TH 013

Universal-Sprühfett **TH 013** ohne Festschmierstoff ist ein Hochleistungs-Schmierstoff mit Hochdruck- und Langzeiteigenschaften. Hochreine oxidationsbeständige Rohstoffe sowie besondere Haftvermittler stellen sicher, dass auch bei extremen Belastungen der Schmierstofffilm geschlossen bleibt und nicht aufreißt. **TH 013** wird überall da im Werkzeug-, Maschinen- sowie im Anlagenbau eingesetzt, wo hohe Anforderungen gestellt werden.  
Temperaturspitze + 180 °C

Universal spray grease is a high performance lubricant with high pressure- and long term-characteristics. Ultrapure oxidation-resistant primary products in combination with special adhesive agents ensure a closed grease film, even under extrem operational demands.  
Temperature max. 180 °C

Aerosol can, 400 ml

Sprühdose, 400 ml



[TH]



## TH 014

Universal-Schmierstoffpaste **TH 014** hat die gleichen Eigenschaften und Parameter wie **TH 013**. Da **TH 014** in Pastenform geliefert wird, kann das Auftragen auf die Metallteile mit einem Pinsel oder von Hand erfolgen.

Tube, 50 ml

Universal lubrication paste **TH 014** has the same characteristics and parameters as **TH 013**. Since it comes as a paste, applying by means of a brush or by hand is possible

Collapsible tube, 50 ml

## TH 014



[TH]



## TH 015

Hochtemperatur Trenn- und Gleitmittel **TH 015** ist ein hochreiner, alterungsstabiler Schmierstoff auf Kupferbasis. **TH 015** erleichtert die Montage / Demontage von Führungselementen, Ventilen, Schraubverbindungen, Flanschen usw. **TH 015** verbackt und verhärtet nicht. Kunststoffe und Dichtwerkstoffe werden nicht angegriffen. Temperaturbereich: - 30 °C bis + 800 °C

Tube, 150 g

High-temperature release- and antiseize-agent **TH 015** is an ultrapure, aging-proof lubricant based on copper. It alleviates the assembly / disassembly of guiding elements, screws, valves, flanges etc. **TH 015** does not harden. Plastics will not be affected or corroded. Temperature range: - 30 °C to + 800 °C

Collapsible tube, 150 g

## TH 015



[TH]



TH 016

Schraubensicherung TH 016 zum Sichern von Schrauben und Muttern bei Vibrationen und Stoß. Für Gewinde bis M24. Teile sind normal demontierbar.  
Handfest in ca. 15 – 30 Min. bei Raumtemperatur.  
Endfest nach ca. 12 Stunden.

Tube, 50 ml

Screw locking TH 016 for safely fixing screws and nuts and prohibiting their turning / loosing caused by shocks and vibrations. For threads up to M24. Treated parts are demountable as usual.  
Hand-tight in appr. 15-30 min. at room temperature.  
Final hardness after 12 hours.

Collapsible tube, 50 ml

TH 016



[TH]





# TH 017

Füge-Verbindungsleber **TH 017** zum Auf- und Einkleben von Schneid- und Führungsbuchsen, Wellen und Lagern.

**TH 017** ist sehr dünnflüssig. Geeignet für Spalte zwischen den Teilen von 0,01 bis 0,10 mm. Teile sind schwer demontierbar.  
Handfest in ca. 5 – 10 Min. bei Raumtemperatur.  
Endfest nach ca. 12 Stunden.

Tube, 50 ml

Adhesive **TH 017**, used for bonding piercing- and die bushings, bonding of shafts and bearings

**TH 017** has a very low viscosity, suitable for gaps between parts of 0,01 to 0,1 mm. Parts are hard to demount afterwards.  
Hand-tight in appr. 5-10 min. at room temperature.  
Final hardness after 12 hours.

Collapsible tube, 50 ml

# TH 017



[TH]



## TH 018

Sekundenkleber **TH 018** ist geeignet für Kunststoffe, Metalle und Gummiartikel. **TH 018** hat ein hohes Spaltfüllvermögen und fließt nicht ab. Ein Ausrichten der zu verklebenden Teile ist möglich.  
Handfest in ca. 10 – 70 Sekunden bei Raumtemperatur.

Fläschchen, 20 g

Instant adhesive **TH 018** can be used with plastics, metals and rubbers. It has high gap-filling - abilities and does not drain-off. The parts to be glued together can be aligned up front.

Hand-tight in appr. 10-70 sec. at room temperature

Small bottle, 20 g

 TH 018



# TH 019

(NCR.99.003)

Leckspray TH 019 ein flüssiges, ungiftiges und nicht brennbares Dichtigkeitsprüfmittel mit Korrosionsschutz. Zum Beispiel bei Leckagen an Druckluft-, Öl- oder Stickstoffanlagen. Durch Aufsprühen von TH 019 auf die zu prüfenden Teile wird durch Blasenbildung sichtbar, dass eine Undichtigkeit gegeben ist. Bilden sich keine Blasen, ist das System in Ordnung. Achtung: Nur außerhalb von Gas- oder Sauerstoffrohren „sprühen“.

Sprühdose, 400 ml

Leakage spray TH 019 is a fluid, non-toxic and fireproofed leakage detecting agent with corrosion protection, detecting leaking areas in air-pressure-, oil- and nitrogene - systems. After spray coating the areas in question, bubbling indicates leaks. Attention: Do not spray in or close to gas- respect. oxigen - pipes

Aerosol can, 400 ml

## TH 019



[TH]







**MSP** **N** **G**  
**M** **B** **H**

**Märkische Stanz-Partner**



**[federelemente]**

**[springs]**






|  | <b>Tellerfedern,<br/>Distanzeinheiten</b>                   | <b>Disk washers, spacers</b>                                   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|--|---|--|--------------------------------|-----------------------|
|  | <u>Distanzeinheiten, geschliffen</u>                        | <u>Spacers, ground</u>   | FE 830                         | FE.2                  |
|  | <u>Distanzrohre, geschliffen</u>                            | <u>Spacer tubes, ground</u>                                    | FE 829                         | FE.3                  |
|  | <u>Scheiben für Zylinderschraube,<br/>nicht geschliffen</u> | <u>Disks for hexagon socket head cap<br/>screw, not ground</u> | FE 828                         | FE.3                  |
|  | <u>Tellerfedern DIN 2093</u>                                | <u>Disk springs DIN 2093</u>                                   | FE 850                         | FE.1                  |

|  | <b>Systemfedern</b>   | <b>Compression springs</b>   | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|--|---|--|--------------------------------|-----------------------|
|  | <u>Systemfedern ISO 10243,<br/>Kennfarbe Grün: Leichte Belastung</u>                | <u>Compression springs, ISO 10243<br/>Color code green: light load springs</u>         | FE 831 LB                      | FE.4<br>FE.5          |
|  | <u>Systemfedern ISO 10243,<br/>Kennfarbe Blau: Mittlere Belastung</u>               | <u>Compression springs, ISO 10243<br/>Color code blue: medium load springs</u>         | FE 832 MB                      | FE.6<br>FE.7          |
|  | <u>Systemfedern ISO 10243,<br/>Kennfarbe Rot: Schwere Belastung</u>                 | <u>Compression springs, ISO 10243<br/>Color code red: heavy load springs</u>           | FE 833 SB                      | FE.8<br>FE.9          |
|  | <u>Systemfedern ISO 10243,<br/>Kennfarbe Gelb: Bes. schw. Belastung</u>             | <u>Compression springs, ISO 10243<br/>Color code yellow: extra h. load springs</u>     | FE 834 BB                      | FE.10<br>FE.11        |
|  | <u>Systemfedern nach US-Farbcodierung,<br/>Kennfarbe Blau: Leichte Belastung</u>    | <u>Compression springs, US color coded<br/>Color code blue: light load springs</u>     | FE 835 LB                      | FE.12<br>FE.13        |
|  | <u>Systemfedern nach US-Farbcodierung,<br/>Kennfarbe Rot: Mittlere Belastung</u>    | <u>Compression springs, US color coded<br/>Color code red: medium load springs</u>     | FE 836 MB                      | FE.14<br>FE.15        |
|  | <u>Systemfedern nach US-Farbcodierung,<br/>Kennfarbe Gold: Schwere Belastung</u>    | <u>Compression springs, US color coded<br/>Color code gold: heavy load springs</u>     | FE 837 SB                      | FE.16<br>FE.17        |
|  | <u>Systemfedern nach US-Farbcodierung,<br/>Kennfarbe Grün: Bes. schw. Belastung</u> | <u>Compression springs, US color coded<br/>Color code green: extra h. load springs</u> | FE 838 BB                      | FE.18<br>FE.19        |

|  | <b>Urelastfedern</b>                         | <b>Elastomer springs</b>                              | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|--|--|---|--------------------------------|-----------------------|
|  | <u>Hohlstangen</u>                           | <u>Hollow bars</u>                                    | FE 804, FE 805,<br>FE 806      | FE.21                 |
|  | <u>Urelastfedern DIN 9835, Kennfarbe Rot</u> | <u>Elastomer springs DIN 9835,<br/>color code red</u> | FE 802                         | FE.20                 |
|  | <u>Vollstangen</u>                           | <u>Solid bars</u>                                     | FE 807, FE 808,<br>FE 809      | FE.23                 |

[FE]

|  | <b>Zubehör Bereich<br/>Federelemente</b>                 | <b>Accessories product<br/>line „springs“</b>                    | <b>Best.-Nr.<br/>Order no.</b> | <b>Seite<br/>Page</b> |
|---|--|--|--------------------------------|-----------------------|
|  | <u>Federteller DIN ISO 10069-2<br/>für Urelastfedern</u> | <u>Spring washers. DIN ISO 10069-2<br/>for elastomer-springs</u> | <b>FE 815</b>                  | <b>FE.22</b>          |
|  | <u>Führungsbolzen für Urelastfedern</u>                  | <u>Guide pins for elastomer springs</u>                          | <b>FE 816</b>                  | <b>FE.22</b>          |

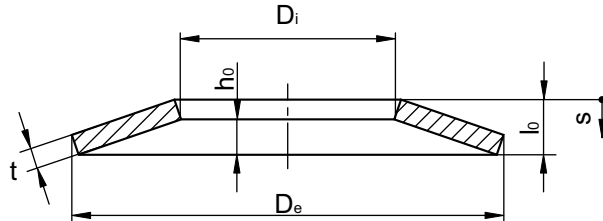


**FE 850**

Mat. bis t = 1,1: CK 67  
Mat. ab t = 1,25: 50CrV4

Mat. up to t = 1,1: CK 67  
Mat. from t = 1,25: 50CrV4

**FE 850 /**  
**8,0 x 4,2 x 0,40**



| De   | Di   | t    | lo   | ho   | s = 0,25 x ho |        |                        | s = 0,5 x ho |        |                        | s = 0,75 x ho |         |                        |
|------|------|------|------|------|---------------|--------|------------------------|--------------|--------|------------------------|---------------|---------|------------------------|
|      |      |      |      |      | s             | F<br>N | σ<br>N/mm <sup>2</sup> | s            | F<br>N | σ<br>N/mm <sup>2</sup> | s             | F<br>N  | σ<br>N/mm <sup>2</sup> |
| 8,0  | 3,2  | 0,40 | 0,60 | 0,20 | 0,050         | 69,2   | 797                    | 0,100        | 130,1  | 1533                   | 0,150         | 185,5   | 2207                   |
| 8,0  | 4,2  | 0,40 | 0,60 | 0,20 | 0,050         | 78,2   | 784                    | 0,100        | 147,1  | 1504                   | 0,150         | 209,5   | 2162                   |
| 10,0 | 5,2  | 0,40 | 0,70 | 0,30 | 0,075         | 87,8   | 857                    | 0,150        | 155,3  | 1623                   | 0,225         | 209,3   | 2299                   |
| 10,0 | 5,2  | 0,50 | 0,75 | 0,25 | 0,062         | 121,5  | 782                    | 0,125        | 228,3  | 1502                   | 0,187         | 325,3   | 2159                   |
| 12,0 | 6,2  | 0,50 | 0,85 | 0,35 | 0,087         | 133,5  | 845                    | 0,175        | 239,2  | 1605                   | 0,262         | 326,4   | 2280                   |
| 12,5 | 6,2  | 0,70 | 1,00 | 0,30 | 0,075         | 239,4  | 804                    | 0,150        | 456,8  | 1550                   | 0,225         | 659,5   | 2240                   |
| 14,0 | 7,2  | 0,80 | 1,10 | 0,30 | 0,075         | 283,8  | 712                    | 0,150        | 547,2  | 1377                   | 0,225         | 796,8   | 1997                   |
| 15,0 | 5,2  | 0,70 | 1,25 | 0,55 | 0,137         | 340,2  | 1317                   | 0,275        | 596,4  | 2497                   | 0,412         | 796,5   | 3541                   |
| 16,0 | 8,2  | 0,60 | 1,05 | 0,45 | 0,112         | 172,0  | 751                    | 0,225        | 304,3  | 1423                   | 0,337         | 410,0   | 2016                   |
| 16,0 | 8,2  | 0,90 | 1,25 | 0,35 | 0,087         | 362,5  | 721                    | 0,175        | 697,0  | 1394                   | 0,262         | 1013,0  | 2019                   |
| 18,0 | 9,2  | 1,00 | 1,40 | 0,40 | 0,100         | 450,6  | 728                    | 0,200        | 865,0  | 1406                   | 0,300         | 1254,0  | 2035                   |
| 20,0 | 10,2 | 0,80 | 1,35 | 0,55 | 0,137         | 304,3  | 759                    | 0,275        | 546,8  | 1442                   | 0,412         | 748,2   | 2050                   |
| 20,0 | 10,2 | 0,90 | 1,45 | 0,55 | 0,137         | 411,7  | 821                    | 0,275        | 754,0  | 1566                   | 0,412         | 1050,0  | 2235                   |
| 20,0 | 10,2 | 1,00 | 1,55 | 0,55 | 0,137         | 543,6  | 882                    | 0,275        | 1010,0 | 1689                   | 0,412         | 1425,0  | 2421                   |
| 20,0 | 10,2 | 1,10 | 1,55 | 0,45 | 0,112         | 548,2  | 733                    | 0,225        | 1050,0 | 1416                   | 0,337         | 1521,0  | 2048                   |
| 23,0 | 12,2 | 1,25 | 1,85 | 0,60 | 0,150         | 863,4  | 881                    | 0,300        | 1630,0 | 1692                   | 0,450         | 2331,0  | 2436                   |
| 25,0 | 12,2 | 0,90 | 1,60 | 0,70 | 0,175         | 366,8  | 724                    | 0,350        | 644,3  | 1371                   | 0,525         | 862,3   | 1940                   |
| 25,0 | 12,2 | 1,50 | 2,05 | 0,55 | 0,137         | 1040,0 | 761                    | 0,275        | 2007,0 | 1473                   | 0,412         | 2926,0  | 2138                   |
| 28,0 | 14,2 | 1,00 | 1,80 | 0,80 | 0,200         | 476,4  | 744                    | 0,400        | 832,0  | 1406                   | 0,600         | 1107,0  | 1986                   |
| 28,0 | 14,2 | 1,50 | 2,15 | 0,65 | 0,162         | 1033,0 | 747                    | 0,325        | 1970,0 | 1440                   | 0,487         | 2841,0  | 2080                   |
| 31,5 | 16,3 | 1,25 | 2,15 | 0,90 | 0,225         | 790,5  | 797                    | 0,450        | 1409,0 | 1512                   | 0,675         | 1913,0  | 2145                   |
| 31,5 | 16,3 | 1,75 | 2,45 | 0,70 | 0,175         | 1391,0 | 729                    | 0,350        | 2669,0 | 1408                   | 0,525         | 3871,0  | 2038                   |
| 34,0 | 12,3 | 1,25 | 2,45 | 1,20 | 0,300         | 946,4  | 1063                   | 0,600        | 1587,0 | 2001                   | 0,900         | 2024,0  | 2814                   |
| 35,5 | 18,3 | 2,00 | 2,80 | 0,80 | 0,200         | 1864,0 | 749                    | 0,400        | 3576,0 | 1448                   | 0,600         | 5187,0  | 2095                   |
| 40,0 | 14,3 | 1,50 | 2,80 | 1,30 | 0,325         | 1188,0 | 962                    | 0,650        | 2040,0 | 1818                   | 0,975         | 2668,0  | 2568                   |
| 40,0 | 20,4 | 2,25 | 3,15 | 0,90 | 0,225         | 2336,0 | 746                    | 0,450        | 4481,0 | 1441                   | 0,675         | 6500,0  | 2086                   |
| 45,0 | 22,4 | 2,50 | 3,50 | 1,00 | 0,250         | 2773,0 | 726                    | 0,500        | 5320,0 | 1403                   | 0,750         | 7716,0  | 2031                   |
| 50,0 | 18,4 | 1,50 | 3,15 | 1,65 | 0,412         | 1166,0 | 855                    | 0,825        | 1890,0 | 1602                   | 1,237         | 2319,0  | 2239                   |
| 50,0 | 25,4 | 2,50 | 3,90 | 1,40 | 0,350         | 3473,0 | 903                    | 0,700        | 6437,0 | 1728                   | 1,050         | 9063,0  | 2474                   |
| 50,0 | 25,4 | 3,00 | 4,10 | 1,10 | 0,275         | 4255,0 | 762                    | 0,550        | 8214,0 | 1476                   | 0,825         | 11976,0 | 2142                   |
| 56,0 | 28,5 | 2,00 | 3,60 | 1,60 | 0,400         | 1910,0 | 744                    | 0,800        | 3335,0 | 1406                   | 1,200         | 4438,0  | 1987                   |
| 60,0 | 20,5 | 2,00 | 4,20 | 2,20 | 0,550         | 2528,0 | 1082                   | 1,100        | 4097,0 | 2028                   | 1,650         | 5026,0  | 2837                   |
| 70,0 | 30,5 | 2,50 | 4,90 | 2,40 | 0,600         | 3755,0 | 961                    | 1,200        | 6297,0 | 1807                   | 1,800         | 8031,0  | 2538                   |
| 80,0 | 36,0 | 3,00 | 5,70 | 2,70 | 0,675         | 5401,0 | 964                    | 1,350        | 9196,0 | 1817                   | 2,025         | 11919,0 | 2557                   |

s = Federweg/ Spring deflection, F = Federkraft/ Spring force, σ = Federspannung/ Spring tension

[FE]



### FE 830

Mat.: Einsatzstahl  
Festigkeitsklasse 12.9

Mat.: case-hardened steel  
Property class 12.9

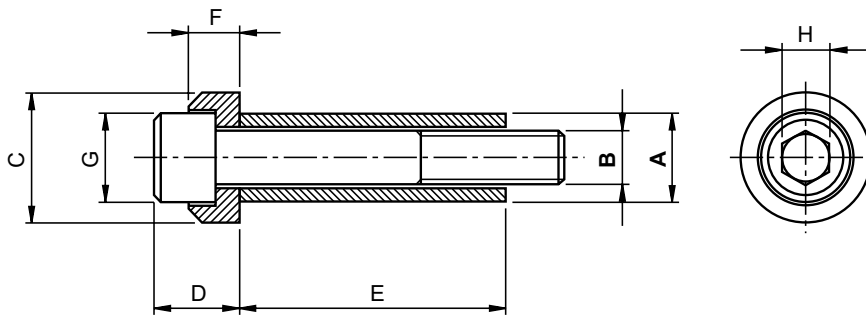
FE 830 / 15,0 x 50

Lieferumfang:

1. Distanzrohr  
Mat.: Vergütungsstahl, geschliffen  
Festigkeit: 120 - 140 kg/mm<sup>2</sup>
2. Scheibe für Zylinderkopfschraube  
Mat.: Vergütungsstahl, nicht geschliffen  
Festigkeit: 100 kg/mm<sup>2</sup>
3. Zylinderschraube mit Innensechskant

Included:

1. Spacer tube  
Mat.: quenched and tempered steel, ground  
Tensile strength: 120 - 140 kg/mm<sup>2</sup>
2. Disk for cylinder head screw  
Mat.: quenched and tempered steel, not ground  
Tensile strength: 100 kg/mm<sup>2</sup>
3. Hexagon socket head cap screw



| A    | B   | C  | D  | F    | G  | H  | E +0,1 |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |   |   |   |
|------|-----|----|----|------|----|----|--------|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|---|---|---|
|      |     |    |    |      |    |    | 20     | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 140 | 150 | 160 |   |   |   |
| 10,0 | M6  | 15 | 10 | 5,5  | 10 | 5  | ●      | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |     |     |     |     |     |     |   |   |   |
| 12,5 | M8  | 19 | 13 | 6,5  | 13 | 6  |        |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |     |     |     |     |     |     |   |   |   |
| 15,0 | M10 | 23 | 15 | 7,5  | 16 | 8  |        |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  |     |     |     |     |     |     |   |   |   |
| 17,5 | M12 | 27 | 18 | 9,0  | 18 | 10 |        |    |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●   | ●   | ●   | ●   |     |     |   |   |   |
| 23,0 | M16 | 34 | 24 | 11,0 | 24 | 14 |        |    |    |    |    | ●  | ●  | ●  | ●  | ●  | ●  | ●  | ●   | ●   | ●   | ●   | ●   | ●   | ● | ● | ● |

[FE]



# Scheiben für Zylinderschraube, nicht geschliffen

## Disks for hex. socket head cap screws, not ground



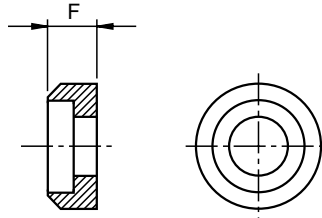
FEDERELEMENTE / SPRINGS

### FE 828

Mat.: Vergütungsstahl,  
nicht geschliffen  
Festigkeit: 100 kg/mm<sup>2</sup>

Mat.: Quenched and temper steel,  
not ground  
Tensile strength: 100 kg/mm<sup>2</sup>

FE 828 / 6,5



| für Zylinderschrauben mit Innensechskant TH 110<br>for socket head cap screws TH 110<br>siehe Seite/ please see page TH.4 | F ±0,2 |
|---|--------|
| M6  | 5,5    |
| M8  | 6,5    |
| M10   | 7,5    |
| M12   | 9,0    |
| M16   | 11,0   |

## Distanzrohr, geschliffen

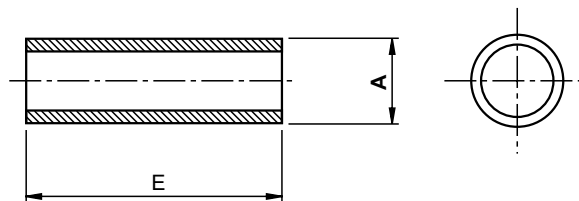
### Spacer tubes, ground

### FE 829

Mat.: Vergütungsstahl,  
geschliffen  
Festigkeit: 120 - 140 kg/mm<sup>2</sup>

Mat.: Quenched and temper steel,  
ground  
Tensile strength: 120 - 140 kg/mm<sup>2</sup>

FE 829 / 12,5 x 50



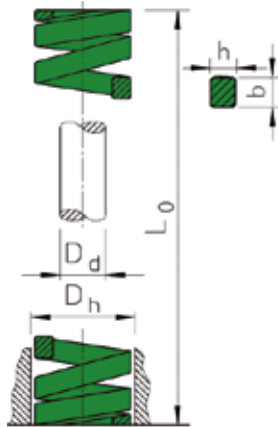
| A<br>h7 | E +0,1 |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |   |
|---------|--------|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|---|
|         | 20     | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 140 | 150 | 160 |   |
| 10,0    | •      | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   |     |     |     |     |     |   |
| 12,5    |        |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   |     |     |     |     |     |   |
| 15,0    |        |    | •  | •  | •  | •  | •  | •  | •  | •  | •  | •  | •   |     | •   |     |     |     |   |
| 17,5    |        |    |    |    | •  | •  | •  | •  | •  | •  | •  | •  | •   | •   | •   | •   |     |     |   |
| 23,0    |        |    |    |    |    |    | •  |    | •  | •  | •  | •  | •   | •   | •   | •   | •   | •   | • |

[FE]



FE 831 LB

FE 831 LB / 10 x 025



| Dh<br>mm | Lo<br>mm | b<br>mm | h<br>mm | Dd<br>mm | C<br>N/mm | 25% Arbeitsweg<br>Working stroke |     | 30% Arbeitsweg<br>Working stroke |      | 40% Arbeitsweg<br>Working stroke |      | max. Federweg<br>max. deflection<br>mm |
|----------|----------|---------|---------|----------|-----------|----------------------------------|-----|----------------------------------|------|----------------------------------|------|--|
|          |          |         |         |          |           | mm                               | N   | mm                               | N    | mm                               | N    |  |
| 10       | 025      | 1,7     | 1,1     | 5,0      | 10,0      | 6,3                              | 63  | 7,5                              | 75   | 10,0                             | 100  | 13,5                                   |
|          | 032      |         |         |          | 8,5       | 8,0                              | 68  | 9,6                              | 82   | 12,8                             | 109  | 17,5                                   |
|          | 038      |         |         |          | 6,8       | 9,5                              | 65  | 11,4                             | 78   | 15,2                             | 103  | 20,8                                   |
|          | 044      |         |         |          | 6,0       | 11,0                             | 66  | 13,2                             | 79   | 17,6                             | 106  | 23,9                                   |
|          | 051      |         |         |          | 5,0       | 12,8                             | 64  | 15,3                             | 77   | 20,4                             | 102  | 28,9                                   |
|          | 064      |         |         |          | 4,3       | 16,0                             | 69  | 19,2                             | 83   | 25,6                             | 110  | 36,1                                   |
|          | 076      |         |         |          | 3,2       | 19,0                             | 61  | 22,8                             | 73   | 30,4                             | 97   | 43,2                                   |
|          | 305      |         |         |          | 1,1       | 76,3                             | 84  | 91,5                             | 101  | 122,0                            | 134  | 178,0                                  |
| 13       | 025      | 2,4     | 1,4     | 6,3      | 17,9      | 6,3                              | 113 | 7,5                              | 134  | 10,0                             | 179  | 13,2                                   |
|          | 032      |         |         |          | 16,4      | 8,0                              | 131 | 9,6                              | 157  | 12,8                             | 210  | 18,0                                   |
|          | 038      |         |         |          | 13,6      | 9,5                              | 129 | 11,4                             | 155  | 15,2                             | 207  | 21,0                                   |
|          | 044      |         |         |          | 12,1      | 11,0                             | 133 | 13,2                             | 160  | 17,6                             | 213  | 24,0                                   |
|          | 051      |         |         |          | 11,4      | 12,8                             | 146 | 15,3                             | 174  | 20,4                             | 233  | 28,7                                   |
|          | 064      |         |         |          | 9,3       | 16,0                             | 149 | 19,2                             | 179  | 25,6                             | 238  | 35,8                                   |
|          | 076      |         |         |          | 7,1       | 19,0                             | 135 | 22,8                             | 162  | 30,4                             | 216  | 42,7                                   |
|          | 089      |         |         |          | 5,4       | 22,3                             | 120 | 26,7                             | 144  | 35,6                             | 192  | 50,4                                   |
|          | 102      |         |         |          | 4,1       | 25,5                             | 105 | 30,6                             | 125  | 40,8                             | 167  | 58,4                                   |
|          | 305      |         |         |          | 1,4       | 76,3                             | 107 | 91,5                             | 128  | 122,0                            | 171  | 172,0                                  |
|          | 16       |         |         |          | 025       | 3,2                              | 1,5 | 8,0                              | 23,4 | 6,3                              | 147  | 7,5                                    |
| 032      |          | 22,9    | 8,0     | 183      | 9,6       |                                  |     |                                  | 220  | 12,8                             | 293  | 16,4                                   |
| 038      |          | 19,3    | 9,5     | 183      | 11,4      |                                  |     |                                  | 220  | 15,2                             | 293  | 19,7                                   |
| 044      |          | 17,1    | 11,0    | 188      | 13,2      |                                  |     |                                  | 226  | 17,6                             | 301  | 22,5                                   |
| 051      |          | 15,7    | 12,8    | 201      | 15,3      |                                  |     |                                  | 240  | 20,4                             | 320  | 26,3                                   |
| 064      |          | 10,7    | 16,0    | 171      | 19,2      |                                  |     |                                  | 205  | 25,6                             | 274  | 33,3                                   |
| 076      |          | 10,0    | 19,0    | 190      | 22,8      |                                  |     |                                  | 228  | 30,4                             | 304  | 40,2                                   |
| 089      |          | 8,6     | 22,3    | 192      | 26,7      |                                  |     |                                  | 230  | 35,6                             | 306  | 47,6                                   |
| 102      |          | 7,8     | 25,5    | 199      | 30,6      |                                  |     |                                  | 239  | 40,8                             | 318  | 55,4                                   |
| 115      |          | 6,6     | 28,8    | 190      | 34,5      |                                  |     |                                  | 228  | 46,0                             | 304  | 60,8                                   |
| 305      |          | 2,5     | 76,3    | 191      | 91,5      |                                  |     |                                  | 229  | 122,0                            | 305  | 165,0                                  |
| 20       |          | 025     | 4,0     | 2,1      | 10,0      |                                  |     |                                  | 55,8 | 6,3                              | 352  | 7,5                                    |
|          | 032      | 45,0    |         |          |           | 8,0                              | 360 | 9,6                              | 432  | 12,8                             | 576  | 15,3                                   |
|          | 038      | 33,3    |         |          |           | 9,5                              | 316 | 11,4                             | 380  | 15,2                             | 506  | 18,9                                   |
|          | 044      | 30,0    |         |          |           | 11,0                             | 330 | 13,2                             | 396  | 17,6                             | 528  | 21,5                                   |
|          | 051      | 24,5    |         |          |           | 12,8                             | 314 | 15,3                             | 375  | 20,4                             | 500  | 25,0                                   |
|          | 064      | 20,0    |         |          |           | 16,0                             | 320 | 19,2                             | 384  | 25,6                             | 512  | 31,1                                   |
|          | 076      | 16,0    |         |          |           | 19,0                             | 304 | 22,8                             | 365  | 30,4                             | 486  | 37,3                                   |
|          | 089      | 14,0    |         |          |           | 22,3                             | 312 | 26,7                             | 374  | 35,6                             | 498  | 44,5                                   |
|          | 102      | 12,0    |         |          |           | 25,5                             | 306 | 30,6                             | 367  | 40,8                             | 490  | 51,1                                   |
|          | 115      | 10,9    |         |          |           | 28,8                             | 314 | 34,5                             | 376  | 46,0                             | 501  | 58,2                                   |
|          | 127      | 9,5     |         |          |           | 31,8                             | 302 | 38,1                             | 362  | 50,8                             | 483  | 64,9                                   |
|          | 139      | 8,5     |         |          |           | 34,8                             | 294 | 41,7                             | 353  | 55,6                             | 470  | 71,5                                   |
|          | 152      | 7,5     |         |          |           | 38,0                             | 285 | 45,6                             | 342  | 60,8                             | 456  | 78,8                                   |
|          | 305      | 4,0     |         |          |           | 76,3                             | 305 | 91,5                             | 366  | 122,0                            | 488  | 157,0                                  |
| 25       | 025      | 5,4     | 2,7     | 12,5     | 100,0     | 6,3                              | 630 | 7,5                              | 750  | 10,0                             | 1000 | 11,9                                   |
|          | 032      |         |         |          | 80,3      | 8,0                              | 642 | 9,6                              | 771  | 12,8                             | 1028 | 16,0                                   |
|          | 038      |         |         |          | 62,0      | 9,5                              | 589 | 11,4                             | 707  | 15,2                             | 942  | 18,3                                   |
|          | 044      |         |         |          | 52,9      | 11,0                             | 582 | 13,2                             | 698  | 17,6                             | 931  | 21,4                                   |
|          | 051      |         |         |          | 44,0      | 12,8                             | 563 | 15,3                             | 673  | 20,4                             | 898  | 24,9                                   |
|          | 064      |         |         |          | 35,2      | 16,0                             | 563 | 19,2                             | 676  | 25,6                             | 901  | 31,4                                   |

[FE]



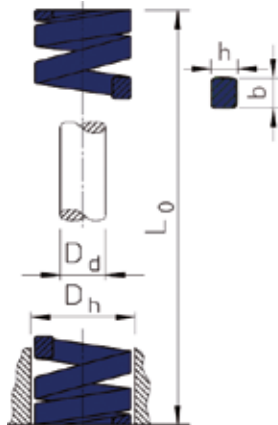


| Dh<br>mm | L0<br>mm | b<br>mm | h<br>mm | Dd<br>mm | C<br>N/mm | 25% Arbeitsweg<br>Working stroke |      | 30% Arbeitsweg<br>Working stroke |       | 40% Arbeitsweg<br>Working stroke |      | max. Federweg<br>max. deflection<br>mm |      |      |      |      |
|----------|----------|---------|---------|----------|-----------|----------------------------------|------|----------------------------------|-------|----------------------------------|------|--|------|------|------|------|
|          |          |         |         |          |           | mm                               | N    | mm                               | N     | mm                               | N    |  |      |      |      |      |
| 25       | 076      | 5,4     | 2,7     | 12,5     | 28,0      | 19,0                             | 532  | 22,8                             | 638   | 30,4                             | 851  | 37,5                                   |      |      |      |      |
|          | 089      |         |         |          | 24,0      | 22,3                             | 535  | 26,7                             | 641   | 35,6                             | 854  | 43,5                                   |      |      |      |      |
|          | 102      |         |         |          | 21,1      | 25,5                             | 538  | 30,6                             | 646   | 40,8                             | 861  | 51,1                                   |      |      |      |      |
|          | 115      |         |         |          | 18,7      | 28,8                             | 539  | 34,5                             | 645   | 46,0                             | 860  | 58,1                                   |      |      |      |      |
|          | 127      |         |         |          | 16,7      | 31,8                             | 531  | 38,1                             | 636   | 50,8                             | 848  | 64,1                                   |      |      |      |      |
|          | 139      |         |         |          | 15,4      | 34,8                             | 536  | 41,7                             | 643   | 55,6                             | 857  | 70,4                                   |      |      |      |      |
|          | 152      |         |         |          | 14,0      | 38,0                             | 532  | 45,6                             | 638   | 60,8                             | 851  | 77,1                                   |      |      |      |      |
|          | 178      |         |         |          | 12,5      | 44,5                             | 556  | 53,4                             | 668   | 71,2                             | 890  | 93,1                                   |      |      |      |      |
|          | 203      |         |         |          | 10,4      | 50,8                             | 528  | 60,9                             | 633   | 81,2                             | 844  | 103,0                                  |      |      |      |      |
|          | 305      |         |         |          | 7,0       | 76,3                             | 534  | 91,5                             | 641   | 122,0                            | 854  | 156,0                                  |      |      |      |      |
|          | 32       |         |         |          | 038       | 6,8                              | 3,3  | 16,0                             | 94,0  | 9,5                              | 893  | 11,4                                   | 1072 | 15,2 | 1429 | 18,3 |
| 044      |          | 79,5    | 11,0    | 875      | 13,2      |                                  |      |                                  | 1049  | 17,6                             | 1399 | 21,5                                   |      |      |      |      |
| 051      |          | 67,0    | 12,8    | 858      | 15,3      |                                  |      |                                  | 1025  | 20,4                             | 1367 | 25,5                                   |      |      |      |      |
| 064      |          | 53,0    | 16,0    | 848      | 19,2      |                                  |      |                                  | 1018  | 25,6                             | 1357 | 31,9                                   |      |      |      |      |
| 076      |          | 44,0    | 19,0    | 836      | 22,8      |                                  |      |                                  | 1003  | 30,4                             | 1338 | 38,6                                   |      |      |      |      |
| 089      |          | 37,2    | 22,3    | 830      | 26,7      |                                  |      |                                  | 993   | 35,6                             | 1324 | 46,5                                   |      |      |      |      |
| 102      |          | 32,0    | 25,5    | 816      | 30,6      |                                  |      |                                  | 979   | 40,8                             | 1306 | 53,2                                   |      |      |      |      |
| 115      |          | 29,0    | 28,8    | 835      | 34,5      |                                  |      |                                  | 1001  | 46,0                             | 1334 | 60,0                                   |      |      |      |      |
| 127      |          | 25,0    | 31,8    | 795      | 38,1      |                                  |      |                                  | 953   | 50,8                             | 1270 | 66,7                                   |      |      |      |      |
| 139      |          | 23,2    | 34,8    | 805      | 41,7      |                                  |      |                                  | 966   | 55,6                             | 1288 | 71,8                                   |      |      |      |      |
| 152      |          | 21,5    | 38,0    | 817      | 45,6      |                                  |      |                                  | 980   | 60,8                             | 1307 | 78,5                                   |      |      |      |      |
| 178      |          | 18,2    | 44,5    | 810      | 53,4      |                                  |      |                                  | 972   | 71,2                             | 1296 | 94,4                                   |      |      |      |      |
| 203      |          | 15,8    | 50,8    | 803      | 60,9      |                                  |      |                                  | 962   | 81,2                             | 1283 | 107,0                                  |      |      |      |      |
| 254      |          | 12,5    | 63,5    | 794      | 76,2      |                                  |      |                                  | 953   | 101,6                            | 1270 | 136,0                                  |      |      |      |      |
| 305      |          | 10,3    | 76,3    | 786      | 91,5      |                                  |      |                                  | 942   | 122,0                            | 1257 | 163,0                                  |      |      |      |      |
| 40       |          | 051     | 8,1     | 4,0      | 20,0      |                                  |      |                                  | 92,0  | 12,8                             | 1178 | 15,3                                   | 1408 | 20,4 | 1877 | 25,5 |
|          |          | 064     |         |          |           |                                  |      |                                  | 73,0  | 16,0                             | 1168 | 19,2                                   | 1402 | 25,6 | 1869 | 31,4 |
|          |          | 076     |         |          |           |                                  |      |                                  | 63,0  | 19,0                             | 1197 | 22,8                                   | 1436 | 30,4 | 1915 | 37,8 |
|          | 089      | 51,0    |         |          |           | 22,3                             | 1137 | 26,7                             | 1362  | 35,6                             | 1816 | 44,3                                   |      |      |      |      |
|          | 102      | 43,0    |         |          |           | 25,5                             | 1097 | 30,6                             | 1316  | 40,8                             | 1754 | 50,7                                   |      |      |      |      |
|          | 115      | 39,6    |         |          |           | 28,8                             | 1140 | 34,5                             | 1366  | 46,0                             | 1822 | 58,1                                   |      |      |      |      |
|          | 127      | 37,0    |         |          |           | 31,8                             | 1177 | 38,1                             | 1410  | 50,8                             | 1880 | 64,6                                   |      |      |      |      |
|          | 139      | 32,2    |         |          |           | 34,8                             | 1120 | 41,7                             | 1344  | 55,6                             | 1792 | 70,1                                   |      |      |      |      |
|          | 152      | 28,0    |         |          |           | 38,0                             | 1064 | 45,6                             | 1277  | 60,8                             | 1702 | 76,6                                   |      |      |      |      |
|          | 178      | 25,2    |         |          |           | 44,5                             | 1121 | 53,4                             | 1346  | 71,2                             | 1794 | 90,4                                   |      |      |      |      |
|          | 203      | 22,7    |         |          |           | 50,8                             | 1153 | 60,9                             | 1382  | 81,2                             | 1843 | 102,0                                  |      |      |      |      |
|          | 254      | 17,0    |         |          |           | 63,5                             | 1080 | 76,2                             | 1295  | 101,6                            | 1727 | 129,0                                  |      |      |      |      |
|          | 305      | 14,8    |         |          |           | 76,3                             | 1129 | 91,5                             | 1354  | 122,0                            | 1806 | 156,0                                  |      |      |      |      |
|          | 50       | 064     |         |          |           | 10,9                             | 5,3  | 25,0                             | 156,0 | 16,0                             | 2496 | 19,2                                   | 2995 | 25,6 | 3994 | 31,0 |
|          |          | 076     |         |          |           |                                  |      |                                  | 125,0 | 19,0                             | 2375 | 22,8                                   | 2850 | 30,4 | 3800 | 37,2 |
|          |          | 089     |         |          |           |                                  |      |                                  | 109,0 | 22,3                             | 2431 | 26,7                                   | 2910 | 35,6 | 3880 | 43,6 |
| 102      |          | 94,0    | 25,5    | 2397     | 30,6      |                                  |      |                                  | 2876  | 40,8                             | 3835 | 50,3                                   |      |      |      |      |
| 115      |          | 81,0    | 28,8    | 2333     | 34,5      |                                  |      |                                  | 2795  | 46,0                             | 3726 | 58,1                                   |      |      |      |      |
| 127      |          | 71,0    | 31,8    | 2358     | 38,1      |                                  |      |                                  | 2705  | 50,8                             | 3607 | 63,7                                   |      |      |      |      |
| 139      |          | 67,0    | 34,8    | 2328     | 41,7      |                                  |      |                                  | 2793  | 55,6                             | 3724 | 69,5                                   |      |      |      |      |
| 152      |          | 60,0    | 38,0    | 2280     | 45,6      |                                  |      |                                  | 2736  | 60,8                             | 3648 | 76,5                                   |      |      |      |      |
| 178      |          | 52,0    | 44,5    | 2314     | 53,4      |                                  |      |                                  | 2777  | 71,2                             | 3702 | 91,9                                   |      |      |      |      |
| 203      |          | 44,0    | 50,8    | 2235     | 60,9      |                                  |      |                                  | 2680  | 81,2                             | 3573 | 105,0                                  |      |      |      |      |
| 254      |          | 35,0    | 63,5    | 2223     | 76,2      |                                  |      |                                  | 2667  | 101,6                            | 3556 | 131,0                                  |      |      |      |      |
| 305      |          | 28,5    | 76,3    | 2175     | 91,5      |                                  |      |                                  | 2608  | 122,0                            | 3477 | 155,0                                  |      |      |      |      |
| 63       |          | 076     | 11,0    | 7,8      | 38,0      |                                  |      |                                  | 189,0 | 19,0                             | 3591 | 22,8                                   | 4309 | 30,4 | 5746 | 36,5 |
|          |          | 089     |         |          |           |                                  |      |                                  | 158,0 | 22,3                             | 3523 | 26,7                                   | 4219 | 35,6 | 5625 | 43,4 |
|          | 102      | 131,0   |         |          |           | 25,5                             | 3341 | 30,6                             | 4009  | 40,8                             | 5345 | 49,7                                   |      |      |      |      |
|          | 115      | 116,0   |         |          |           | 28,8                             | 3341 | 34,5                             | 4002  | 46,0                             | 5336 | 55,6                                   |      |      |      |      |
|          | 127      | 103,0   |         |          |           | 31,8                             | 3275 | 38,1                             | 3924  | 50,8                             | 5232 | 62,7                                   |      |      |      |      |
|          | 152      | 84,3    |         |          |           | 38,0                             | 3203 | 45,6                             | 3844  | 60,8                             | 5125 | 77,1                                   |      |      |      |      |
|          | 178      | 71,5    |         |          |           | 44,5                             | 3182 | 53,4                             | 3818  | 71,2                             | 5091 | 92,2                                   |      |      |      |      |
|          | 203      | 61,7    |         |          |           | 50,8                             | 3134 | 60,9                             | 3758  | 81,2                             | 5010 | 103,0                                  |      |      |      |      |
|          | 254      | 47,0    |         |          |           | 63,5                             | 2985 | 76,2                             | 3581  | 101,6                            | 4775 | 130,0                                  |      |      |      |      |
|          | 305      | 38,2    |         |          |           | 76,3                             | 2915 | 91,5                             | 3495  | 122,0                            | 4660 | 157,0                                  |      |      |      |      |



FE 832 MB

FE 832 MB / 10 x 025



| Dh<br>mm | Lo<br>mm | b<br>mm | h<br>mm | Dd<br>mm | C<br>N/mm | 25% Arbeitsweg<br>Working stroke |     | 30% Arbeitsweg<br>Working stroke |       | 37,5% Arbeitsweg<br>Working stroke |      | max. Federweg<br>max. deflection<br>mm |      |      |      |      |
|----------|----------|---------|---------|----------|-----------|----------------------------------|-----|----------------------------------|-------|------------------------------------|------|--|------|------|------|------|
|          |          |         |         |          |           | mm                               | N   | mm                               | N     | mm                                 | N    |  |      |      |      |      |
| 10       | 025      | 1,9     | 1,3     | 5,0      | 16,0      | 6,3                              | 101 | 7,5                              | 120   | 9,4                                | 150  | 10,2                                   |      |      |      |      |
|          | 032      |         |         |          | 13,0      | 8,0                              | 104 | 9,6                              | 125   | 12,0                               | 156  | 14,2                                   |      |      |      |      |
|          | 038      |         |         |          | 11,9      | 9,5                              | 113 | 11,4                             | 136   | 14,3                               | 170  | 16,8                                   |      |      |      |      |
|          | 044      |         |         |          | 10,3      | 11,0                             | 113 | 13,2                             | 136   | 16,5                               | 170  | 19,4                                   |      |      |      |      |
|          | 051      |         |         |          | 8,9       | 12,8                             | 114 | 15,3                             | 136   | 19,1                               | 170  | 23,4                                   |      |      |      |      |
|          | 064      |         |         |          | 7,5       | 16,0                             | 120 | 19,2                             | 144   | 24,0                               | 180  | 28,2                                   |      |      |      |      |
|          | 076      |         |         |          | 5,3       | 19,0                             | 101 | 22,8                             | 121   | 28,5                               | 151  | 34,2                                   |      |      |      |      |
|          | 305      |         |         |          | 1,6       | 76,3                             | 122 | 91,5                             | 146   | 114,4                              | 183  | 134,0                                  |      |      |      |      |
| 13       | 025      | 2,5     | 1,5     | 6,3      | 30,0      | 6,3                              | 189 | 7,5                              | 225   | 9,4                                | 282  | 11,9                                   |      |      |      |      |
|          | 032      |         |         |          | 24,8      | 8,0                              | 198 | 9,6                              | 238   | 12,0                               | 298  | 16,2                                   |      |      |      |      |
|          | 038      |         |         |          | 21,4      | 9,5                              | 203 | 11,4                             | 244   | 14,3                               | 306  | 18,7                                   |      |      |      |      |
|          | 044      |         |         |          | 18,5      | 11,0                             | 204 | 13,2                             | 244   | 16,5                               | 305  | 21,3                                   |      |      |      |      |
|          | 051      |         |         |          | 15,5      | 12,8                             | 198 | 15,3                             | 237   | 19,1                               | 296  | 25,6                                   |      |      |      |      |
|          | 064      |         |         |          | 12,1      | 16,0                             | 194 | 19,2                             | 232   | 24,0                               | 290  | 32,4                                   |      |      |      |      |
|          | 076      |         |         |          | 10,2      | 19,0                             | 194 | 22,8                             | 233   | 28,5                               | 291  | 39,0                                   |      |      |      |      |
|          | 089      |         |         |          | 8,4       | 22,3                             | 187 | 26,7                             | 224   | 33,4                               | 281  | 45,9                                   |      |      |      |      |
|          | 102      |         |         |          | 6,3       | 25,5                             | 161 | 30,6                             | 193   | 38,3                               | 241  | 52,3                                   |      |      |      |      |
|          | 305      |         |         |          | 2,1       | 76,3                             | 160 | 91,5                             | 192   | 114,4                              | 240  | 153,0                                  |      |      |      |      |
|          | 16       |         |         |          | 025       | 3,2                              | 2,0 | 8,0                              | 49,4  | 6,3                                | 311  | 7,5                                    | 371  | 9,4  | 464  | 10,5 |
| 032      |          | 37,1    | 8,0     | 297      | 9,6       |                                  |     |                                  | 356   | 12,0                               | 445  | 13,2                                   |      |      |      |      |
| 038      |          | 33,9    | 9,5     | 322      | 11,4      |                                  |     |                                  | 386   | 14,3                               | 485  | 17,2                                   |      |      |      |      |
| 044      |          | 30,0    | 11,0    | 330      | 13,2      |                                  |     |                                  | 396   | 16,5                               | 495  | 19,4                                   |      |      |      |      |
| 051      |          | 26,4    | 12,8    | 338      | 15,3      |                                  |     |                                  | 404   | 19,1                               | 504  | 24,2                                   |      |      |      |      |
| 064      |          | 20,5    | 16,0    | 328      | 19,2      |                                  |     |                                  | 394   | 24,0                               | 492  | 29,2                                   |      |      |      |      |
| 076      |          | 17,8    | 19,0    | 338      | 22,8      |                                  |     |                                  | 406   | 28,5                               | 507  | 36,3                                   |      |      |      |      |
| 089      |          | 15,2    | 22,3    | 339      | 26,7      |                                  |     |                                  | 406   | 33,4                               | 508  | 41,7                                   |      |      |      |      |
| 102      |          | 13,5    | 25,5    | 344      | 30,6      |                                  |     |                                  | 413   | 38,3                               | 517  | 48,9                                   |      |      |      |      |
| 115      |          | 11,8    | 28,8    | 340      | 34,5      |                                  |     |                                  | 407   | 43,1                               | 509  | 53,1                                   |      |      |      |      |
| 305      |          | 4,8     | 76,3    | 366      | 91,5      |                                  |     |                                  | 439   | 114,4                              | 549  | 142,0                                  |      |      |      |      |
| 20       |          | 025     | 4,1     | 2,4      | 10,0      |                                  |     |                                  | 98,0  | 6,3                                | 617  | 7,5                                    | 735  | 9,4  | 921  | 10,5 |
|          |          | 032     |         |          |           |                                  |     |                                  | 72,6  | 8,0                                | 581  | 9,6                                    | 697  | 12,0 | 871  | 13,9 |
|          | 038      | 56,0    |         |          |           | 9,5                              | 532 | 11,4                             | 638   | 14,3                               | 801  | 16,6                                   |      |      |      |      |
|          | 044      | 47,5    |         |          |           | 11,0                             | 523 | 13,2                             | 627   | 16,5                               | 784  | 18,8                                   |      |      |      |      |
|          | 051      | 41,7    |         |          |           | 12,8                             | 534 | 15,3                             | 638   | 19,1                               | 796  | 23,1                                   |      |      |      |      |
|          | 064      | 32,3    |         |          |           | 16,0                             | 517 | 19,2                             | 620   | 24,0                               | 775  | 27,5                                   |      |      |      |      |
|          | 076      | 25,1    |         |          |           | 19,0                             | 477 | 22,8                             | 572   | 28,5                               | 715  | 33,8                                   |      |      |      |      |
|          | 089      | 22,0    |         |          |           | 22,3                             | 491 | 26,7                             | 587   | 33,4                               | 735  | 39,7                                   |      |      |      |      |
|          | 102      | 19,8    |         |          |           | 25,5                             | 505 | 30,6                             | 606   | 38,3                               | 758  | 47,3                                   |      |      |      |      |
|          | 115      | 18,1    |         |          |           | 28,8                             | 521 | 34,5                             | 624   | 43,1                               | 780  | 52,5                                   |      |      |      |      |
|          | 127      | 16,6    |         |          |           | 31,8                             | 528 | 38,1                             | 632   | 47,6                               | 790  | 56,9                                   |      |      |      |      |
|          | 139      | 15,2    |         |          |           | 34,8                             | 529 | 41,7                             | 634   | 52,1                               | 793  | 62,1                                   |      |      |      |      |
|          | 152      | 13,2    |         |          |           | 38,0                             | 500 | 45,6                             | 600   | 57,0                               | 750  | 67,6                                   |      |      |      |      |
|          | 305      | 6,1     |         |          |           | 76,3                             | 465 | 91,5                             | 558   | 114,4                              | 698  | 143,0                                  |      |      |      |      |
|          | 25       | 025     |         |          |           | 5,4                              | 3,3 | 12,5                             | 147,0 | 6,3                                | 926  | 7,5                                    | 1103 | 9,4  | 1382 | 10,2 |
| 032      |          | 118,0   | 8,0     | 944      | 9,6       |                                  |     |                                  | 1133  | 12,0                               | 1416 | 13,7                                   |      |      |      |      |
| 038      |          | 93,0    | 9,5     | 884      | 11,4      |                                  |     |                                  | 1060  | 14,3                               | 1330 | 15,7                                   |      |      |      |      |
| 044      |          | 80,8    | 11,0    | 889      | 13,2      |                                  |     |                                  | 1067  | 16,5                               | 1333 | 18,2                                   |      |      |      |      |
| 051      |          | 68,6    | 12,8    | 878      | 15,3      |                                  |     |                                  | 1050  | 19,1                               | 1310 | 21,7                                   |      |      |      |      |
| 064      |          | 53,0    | 16,0    | 848      | 19,2      |                                  |     |                                  | 1018  | 24,0                               | 1272 | 26,0                                   |      |      |      |      |

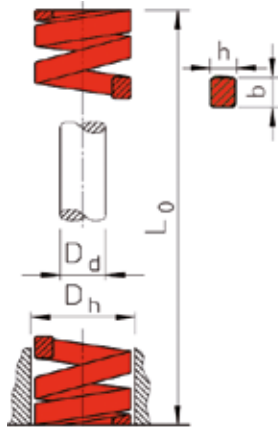
[FE]




| Dh<br>mm | Lo<br>mm | b<br>mm | h<br>mm | Dd<br>mm | C<br>N/mm | 25% Arbeitsweg<br>Working stroke |      | 30% Arbeitsweg<br>Working stroke |       | 37,5% Arbeitsweg<br>Working stroke |      | max. Federweg<br>max. deflection<br>mm |
|----------|----------|---------|---------|----------|-----------|----------------------------------|------|----------------------------------|-------|------------------------------------|------|--|
|          |          |         |         |          |           | mm                               | N    | mm                               | N     | mm                                 | N    |  |
| 25       | 076      | 5,4     | 3,3     | 12,5     | 43,2      | 19,0                             | 821  | 22,8                             | 985   | 28,5                               | 1231 | 32,3                                   |
|          | 089      |         |         |          | 38,2      | 22,3                             | 852  | 26,7                             | 1020  | 33,4                               | 1276 | 38,0                                   |
|          | 102      |         |         |          | 33,0      | 25,5                             | 842  | 30,6                             | 1010  | 38,3                               | 1264 | 43,0                                   |
|          | 115      |         |         |          | 28,0      | 28,8                             | 806  | 34,5                             | 966   | 43,1                               | 1207 | 48,6                                   |
|          | 127      |         |         |          | 25,9      | 31,8                             | 824  | 38,1                             | 987   | 47,6                               | 1233 | 53,7                                   |
|          | 139      |         |         |          | 23,4      | 34,8                             | 812  | 41,7                             | 974   | 52,1                               | 1218 | 59,4                                   |
|          | 152      |         |         |          | 20,8      | 38,0                             | 790  | 45,6                             | 948   | 57,0                               | 1186 | 63,8                                   |
|          | 178      |         |         |          | 17,8      | 44,5                             | 792  | 53,4                             | 951   | 66,8                               | 1189 | 76,6                                   |
|          | 203      |         |         |          | 15,8      | 50,8                             | 803  | 60,9                             | 962   | 76,1                               | 1202 | 88,4                                   |
|          | 305      |         |         |          | 10,2      | 76,3                             | 778  | 91,5                             | 933   | 114,4                              | 1167 | 135,0                                  |
| 32       | 038      | 6,8     | 4,0     | 16,0     | 185,0     | 9,5                              | 1758 | 11,4                             | 2109  | 14,3                               | 2646 | 16,3                                   |
|          | 044      |         |         |          | 158,0     | 11,0                             | 1738 | 13,2                             | 2086  | 16,5                               | 2607 | 18,9                                   |
|          | 051      |         |         |          | 134,0     | 12,8                             | 1715 | 15,3                             | 2050  | 19,1                               | 2559 | 23,1                                   |
|          | 064      |         |         |          | 99,0      | 16,0                             | 1584 | 19,2                             | 1901  | 24,0                               | 2376 | 28,5                                   |
|          | 076      |         |         |          | 80,5      | 19,0                             | 1530 | 22,8                             | 1835  | 28,5                               | 2294 | 34,2                                   |
|          | 089      |         |         |          | 69,1      | 22,3                             | 1541 | 26,7                             | 1845  | 33,4                               | 2308 | 40,4                                   |
|          | 102      |         |         |          | 58,8      | 25,5                             | 1499 | 30,6                             | 1799  | 38,3                               | 2252 | 48,0                                   |
|          | 115      |         |         |          | 51,5      | 28,8                             | 1483 | 34,5                             | 1777  | 43,1                               | 2220 | 54,3                                   |
|          | 127      |         |         |          | 44,8      | 31,8                             | 1425 | 38,1                             | 1707  | 47,6                               | 2132 | 59,2                                   |
|          | 139      |         |         |          | 42,6      | 34,8                             | 1481 | 41,7                             | 1777  | 52,1                               | 2221 | 65,3                                   |
|          | 152      |         |         |          | 37,8      | 38,0                             | 1436 | 45,6                             | 1724  | 57,0                               | 2155 | 73,0                                   |
|          | 178      |         |         |          | 32,5      | 44,5                             | 1446 | 53,4                             | 1736  | 66,8                               | 2171 | 84,5                                   |
|          | 203      |         |         |          | 28,9      | 50,8                             | 1468 | 60,9                             | 1760  | 76,1                               | 2199 | 96,9                                   |
|          | 254      |         |         |          | 21,4      | 63,5                             | 1359 | 76,2                             | 1631  | 95,3                               | 2039 | 121,0                                  |
|          | 305      |         |         |          | 18,3      | 76,3                             | 1396 | 91,5                             | 1674  | 114,4                              | 2094 | 147,0                                  |
|          | 40       |         |         |          | 051       | 8,2                              | 4,7  | 20,0                             | 181,6 | 12,8                               | 2324 | 15,3                                   |
| 064      |          | 140,0   | 16,0    | 2240     | 19,2      |                                  |      |                                  | 2688  | 24,0                               | 3360 | 26,8                                   |
| 076      |          | 108,0   | 19,0    | 2052     | 22,8      |                                  |      |                                  | 2462  | 28,5                               | 3078 | 32,7                                   |
| 089      |          | 90,7    | 22,3    | 2023     | 26,7      |                                  |      |                                  | 2422  | 33,4                               | 3029 | 39,0                                   |
| 102      |          | 81,0    | 25,5    | 2066     | 30,6      |                                  |      |                                  | 2479  | 38,3                               | 3102 | 44,1                                   |
| 115      |          | 71,8    | 28,8    | 2068     | 34,5      |                                  |      |                                  | 2477  | 43,1                               | 3095 | 50,6                                   |
| 127      |          | 62,7    | 31,8    | 1994     | 38,1      |                                  |      |                                  | 2389  | 47,6                               | 2985 | 55,9                                   |
| 139      |          | 57,9    | 34,8    | 2013     | 41,7      |                                  |      |                                  | 2415  | 52,1                               | 3019 | 61,8                                   |
| 152      |          | 51,6    | 38,0    | 1961     | 45,6      |                                  |      |                                  | 2353  | 57,0                               | 2941 | 67,5                                   |
| 178      |          | 44,1    | 44,5    | 1962     | 53,4      |                                  |      |                                  | 2355  | 66,8                               | 2946 | 77,2                                   |
| 203      |          | 36,7    | 50,8    | 1864     | 60,9      |                                  |      |                                  | 2235  | 76,1                               | 2793 | 91,8                                   |
| 254      |          | 30,1    | 63,5    | 1911     | 76,2      |                                  |      |                                  | 2294  | 95,3                               | 2869 | 113,0                                  |
| 305      |          | 24,6    | 76,3    | 1877     | 91,5      |                                  |      |                                  | 2251  | 114,4                              | 2814 | 138,0                                  |
| 50       |          | 064     | 11,1    | 5,8      | 25,0      |                                  |      |                                  | 209,0 | 16,0                               | 3344 | 19,2                                   |
|          | 076      | 168,0   |         |          |           | 19,0                             | 3192 | 22,8                             | 3830  | 28,5                               | 4788 | 34,9                                   |
|          | 089      | 140,0   |         |          |           | 22,3                             | 3122 | 26,7                             | 3738  | 33,4                               | 4676 | 39,2                                   |
|          | 102      | 119,0   |         |          |           | 25,5                             | 3035 | 30,6                             | 3641  | 38,3                               | 4558 | 47,3                                   |
|          | 115      | 106,0   |         |          |           | 28,8                             | 3053 | 34,5                             | 3657  | 43,1                               | 4569 | 52,6                                   |
|          | 127      | 97,0    |         |          |           | 31,8                             | 3085 | 38,1                             | 3696  | 47,6                               | 4617 | 59,8                                   |
|          | 139      | 87,6    |         |          |           | 34,8                             | 3045 | 41,7                             | 3654  | 52,1                               | 4568 | 65,1                                   |
|          | 152      | 80,0    |         |          |           | 38,0                             | 3040 | 45,6                             | 3648  | 57,0                               | 4560 | 70,8                                   |
|          | 178      | 69,5    |         |          |           | 44,5                             | 3093 | 53,4                             | 3711  | 66,8                               | 4643 | 84,2                                   |
|          | 203      | 59,8    |         |          |           | 50,8                             | 3038 | 60,9                             | 3642  | 76,1                               | 4551 | 96,5                                   |
|          | 229      | 50,9    |         |          |           | 57,3                             | 2917 | 68,7                             | 3497  | 85,9                               | 4372 | 108,0                                  |
|          | 254      | 43,9    |         |          |           | 63,5                             | 2788 | 76,2                             | 3345  | 95,3                               | 4184 | 122,0                                  |
|          | 305      | 38,6    |         |          |           | 76,3                             | 2945 | 91,5                             | 3532  | 114,4                              | 4416 | 147,0                                  |
|          | 63       | 076     |         |          |           | 11,5                             | 9,1  | 38,0                             | 312,0 | 19,0                               | 5928 | 22,8                                   |
| 089      |          | 260,0   | 22,3    | 5789     | 26,7      |                                  |      |                                  | 6942  | 33,4                               | 8684 | 36,5                                   |
| 102      |          | 221,0   | 25,5    | 5636     | 30,6      |                                  |      |                                  | 6763  | 38,3                               | 8464 | 43,6                                   |
| 115      |          | 187,0   | 28,8    | 5386     | 34,5      |                                  |      |                                  | 6452  | 43,1                               | 8060 | 48,9                                   |
| 127      |          | 168,0   | 31,8    | 5342     | 38,1      |                                  |      |                                  | 6401  | 47,6                               | 7997 | 54,2                                   |
| 152      |          | 136,0   | 38,0    | 5168     | 45,6      |                                  |      |                                  | 6202  | 57,0                               | 7752 | 65,7                                   |
| 178      |          | 114,0   | 44,5    | 5073     | 53,4      |                                  |      |                                  | 6088  | 66,8                               | 7615 | 76,5                                   |
| 203      |          | 100,0   | 50,8    | 5080     | 60,9      |                                  |      |                                  | 6090  | 76,1                               | 7610 | 88,0                                   |
| 229      |          | 89,2    | 57,3    | 5111     | 68,7      |                                  |      |                                  | 6128  | 85,9                               | 7662 | 104,0                                  |
| 254      |          | 78,4    | 63,5    | 4978     | 76,2      |                                  |      |                                  | 5974  | 95,3                               | 7472 | 112,0                                  |
| 305      |          | 64,7    | 76,3    | 4937     | 91,5      |                                  |      |                                  | 5920  | 114,4                              | 7402 | 134,0                                  |

**FE 833 SB**

 **FE 833 SB / 10 x 025**



| Dh<br>mm | Lo<br>mm | b<br>mm | h<br>mm | Dd<br>mm | C<br>N/mm | 20% Arbeitsweg<br>Working stroke |      | 25% Arbeitsweg<br>Working stroke |       | 30% Arbeitsweg<br>Working stroke |      | max. Federweg<br>max. deflection<br>mm  |
|----------|----------|---------|---------|----------|-----------|----------------------------------|------|----------------------------------|-------|----------------------------------|------|--|
|          |          |         |         |          |           | mm                               | N    | mm                               | N     | mm                               | N    |  |
| 10       | 025      | 1,9     | 1,5     | 5,0      | 22,1      | 5,0                              | 111  | 6,3                              | 139   | 7,5                              | 166  | 9,2  |
|          | 032      |         |         |          | 17,5      | 6,4                              | 112  | 8,0                              | 140   | 9,6                              | 168  | 12,1   |
|          | 038      |         |         |          | 17,1      | 7,6                              | 130  | 9,5                              | 162   | 11,4                             | 195  | 13,2   |
|          | 044      |         |         |          | 15,0      | 8,8                              | 132  | 11,0                             | 165   | 13,2                             | 198  | 15,1   |
|          | 051      |         |         |          | 12,8      | 10,2                             | 131  | 12,8                             | 164   | 15,3                             | 196  | 19,5   |
|          | 064      |         |         |          | 10,7      | 12,8                             | 137  | 16,0                             | 171   | 19,2                             | 205  | 21,8   |
|          | 076      |         |         |          | 7,5       | 15,2                             | 114  | 19,0                             | 143   | 22,8                             | 171  | 27,9   |
|          | 305      |         |         |          | 2,1       | 61,0                             | 128  | 76,3                             | 160   | 91,5                             | 192  | 127,0  |
| 13       | 025      | 2,4     | 1,9     | 6,3      | 42,1      | 5,0                              | 211  | 6,3                              | 265   | 7,5                              | 316  | 9,8  |
|          | 032      |         |         |          | 33,2      | 6,4                              | 212  | 8,0                              | 266   | 9,6                              | 319  | 13,6   |
|          | 038      |         |         |          | 29,3      | 7,6                              | 223  | 9,5                              | 278   | 11,4                             | 334  | 14,6   |
|          | 044      |         |         |          | 24,6      | 8,8                              | 216  | 11,0                             | 271   | 13,2                             | 325  | 18,1   |
|          | 051      |         |         |          | 19,6      | 10,2                             | 200  | 12,8                             | 251   | 15,3                             | 300  | 22,3   |
|          | 064      |         |         |          | 15,0      | 12,8                             | 192  | 16,0                             | 240   | 19,2                             | 288  | 27,3   |
|          | 076      |         |         |          | 13,2      | 15,2                             | 201  | 19,0                             | 251   | 22,8                             | 301  | 33,1   |
|          | 089      |         |         |          | 11,4      | 17,8                             | 203  | 22,3                             | 254   | 26,7                             | 304  | 38,9   |
|          | 102      |         |         |          | 8,4       | 20,4                             | 171  | 25,5                             | 214   | 30,6                             | 257  | 43,8   |
|          | 305      |         |         |          | 2,8       | 61,0                             | 171  | 76,3                             | 214   | 91,5                             | 256  | 140,0  |
|          | 16       |         |         |          | 025       | 3,1                              | 2,5  | 8,0                              | 75,7  | 5,0                              | 379  | 6,3  |
| 032      |          | 52,8    | 6,4     | 338      | 8,0       |                                  |      |                                  | 422   | 9,6                              | 507  | 10,5   |
| 038      |          | 48,5    | 7,6     | 369      | 9,5       |                                  |      |                                  | 461   | 11,4                             | 553  | 13,6   |
| 044      |          | 42,8    | 8,8     | 377      | 11,0      |                                  |      |                                  | 471   | 13,2                             | 565  | 15,9   |
| 051      |          | 37,1    | 10,2    | 378      | 12,8      |                                  |      |                                  | 475   | 15,3                             | 568  | 18,9   |
| 064      |          | 30,3    | 12,8    | 388      | 16,0      |                                  |      |                                  | 485   | 19,2                             | 582  | 24,9   |
| 076      |          | 25,7    | 15,2    | 391      | 19,0      |                                  |      |                                  | 488   | 22,8                             | 586  | 29,2   |
| 089      |          | 21,7    | 17,8    | 386      | 22,3      |                                  |      |                                  | 484   | 26,7                             | 579  | 34,5   |
| 102      |          | 19,3    | 20,4    | 394      | 25,5      |                                  |      |                                  | 492   | 30,6                             | 591  | 39,1   |
| 115      |          | 15,7    | 23,0    | 361      | 28,8      |                                  |      |                                  | 452   | 34,5                             | 542  | 44,0   |
| 305      |          | 7,1     | 61,0    | 433      | 76,3      |                                  |      |                                  | 542   | 91,5                             | 650  | 104,0  |
| 20       |          | 025     | 4,0     | 3,3      | 10,0      |                                  |      |                                  | 216,0 | 5,0                              | 1080 | 6,3  |
|          | 032      | 168,0   |         |          |           | 6,4                              | 1075 | 8,0                              | 1344  | 9,6                              | 1613 | 10,9   |
|          | 038      | 129,0   |         |          |           | 7,6                              | 980  | 9,5                              | 1226  | 11,4                             | 1471 | 12,5   |
|          | 044      | 112,0   |         |          |           | 8,8                              | 986  | 11,0                             | 1232  | 13,2                             | 1478 | 15,0   |
|          | 051      | 94,0    |         |          |           | 10,2                             | 959  | 12,8                             | 1203  | 15,3                             | 1438 | 17,6   |
|          | 064      | 72,1    |         |          |           | 12,8                             | 923  | 16,0                             | 1154  | 19,2                             | 1384 | 22,6   |
|          | 076      | 59,7    |         |          |           | 15,2                             | 907  | 19,0                             | 1134  | 22,8                             | 1361 | 27,5   |
|          | 089      | 50,5    |         |          |           | 17,8                             | 899  | 22,3                             | 1126  | 26,7                             | 1348 | 31,7   |
|          | 102      | 44,2    |         |          |           | 20,4                             | 902  | 25,5                             | 1127  | 30,6                             | 1353 | 37,5   |
|          | 115      | 38,4    |         |          |           | 23,0                             | 883  | 28,8                             | 1106  | 34,5                             | 1325 | 42,6   |
|          | 127      | 34,1    |         |          |           | 25,4                             | 866  | 31,8                             | 1084  | 38,1                             | 1299 | 45,5   |
|          | 139      | 31,2    |         |          |           | 27,8                             | 868  | 34,8                             | 1085  | 41,7                             | 1302 | 50,1   |
|          | 152      | 28,2    |         |          |           | 30,4                             | 857  | 38,0                             | 1072  | 45,6                             | 1286 | 55,8   |
|          | 305      | 15,0    |         |          |           | 61,0                             | 915  | 76,3                             | 1145  | 91,5                             | 1373 | 114,0  |
|          | 25       | 025     |         |          |           | 5,5                              | 4,2  | 12,5                             | 375,1 | 5,0                              | 1875 | 6,3  |
| 032      |          | 297,0   | 6,4     | 1901     | 8,0       |                                  |      |                                  | 2376  | 9,6                              | 2851 | 11,0   |
| 038      |          | 219,0   | 7,6     | 1664     | 9,5       |                                  |      |                                  | 2081  | 11,4                             | 2497 | 12,6   |
| 044      |          | 187,0   | 8,8     | 1646     | 11,0      |                                  |      |                                  | 2057  | 13,2                             | 2468 | 14,8   |
| 051      |          | 156,0   | 10,2    | 1591     | 12,8      |                                  |      |                                  | 1997  | 15,3                             | 2387 | 17,9   |
| 064      |          | 123,0   | 12,8    | 1574     | 16,0      |                                  |      |                                  | 1968  | 19,2                             | 2362 | 23,1   |

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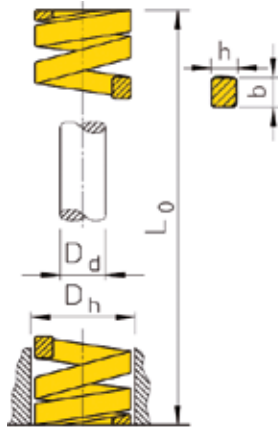
| Dh<br>mm | Lo<br>mm | b<br>mm | h<br>mm | Dd<br>mm | C<br>N/mm | 20% Arbeitsweg<br>Working stroke |      | 25% Arbeitsweg<br>Working stroke |       | 30% Arbeitsweg<br>Working stroke |       | max. Federweg<br>max. deflection<br>mm |       |      |       |      |
|----------|----------|---------|---------|----------|-----------|----------------------------------|------|----------------------------------|-------|----------------------------------|-------|--|-------|------|-------|------|
|          |          |         |         |          |           | mm                               | N    | mm                               | N     | mm                               | N     |  |       |      |       |      |
| 25       | 076      | 5,5     | 4,2     | 12,5     | 99,0      | 15,2                             | 1505 | 19,0                             | 1881  | 22,8                             | 2257  | 26,3                                   |       |      |       |      |
|          | 089      |         |         |          | 84,0      | 17,8                             | 1495 | 22,3                             | 1873  | 26,7                             | 2243  | 30,5                                   |       |      |       |      |
|          | 102      |         |         |          | 73,0      | 20,4                             | 1489 | 25,5                             | 1862  | 30,6                             | 2234  | 37,3                                   |       |      |       |      |
|          | 115      |         |         |          | 65,0      | 23,0                             | 1495 | 28,8                             | 1872  | 34,5                             | 2243  | 41,9                                   |       |      |       |      |
|          | 127      |         |         |          | 57,7      | 25,4                             | 1466 | 31,8                             | 1835  | 38,1                             | 2198  | 46,2                                   |       |      |       |      |
|          | 139      |         |         |          | 53,1      | 27,8                             | 1476 | 34,8                             | 1844  | 41,7                             | 2213  | 49,3                                   |       |      |       |      |
|          | 152      |         |         |          | 47,8      | 30,4                             | 1453 | 38,0                             | 1816  | 45,6                             | 2180  | 55,7                                   |       |      |       |      |
|          | 178      |         |         |          | 41,0      | 35,6                             | 1460 | 44,5                             | 1825  | 53,4                             | 2189  | 65,1                                   |       |      |       |      |
|          | 203      |         |         |          | 35,8      | 40,6                             | 1453 | 50,8                             | 1819  | 60,9                             | 2180  | 74,5                                   |       |      |       |      |
|          | 305      |         |         |          | 22,9      | 61,0                             | 1397 | 76,3                             | 1747  | 91,5                             | 2095  | 110,0                                  |       |      |       |      |
| 32       | 038      | 7,1     | 5,4     | 16,0     | 388,0     | 7,6                              | 2949 | 9,5                              | 3686  | 11,4                             | 4423  | 12,5                                   |       |      |       |      |
|          | 044      |         |         |          | 324,0     | 8,8                              | 2851 | 11,0                             | 3564  | 13,2                             | 4277  | 14,9                                   |       |      |       |      |
|          | 051      |         |         |          | 272,0     | 10,2                             | 2774 | 12,8                             | 3482  | 15,3                             | 4162  | 17,8                                   |       |      |       |      |
|          | 064      |         |         |          | 212,0     | 12,8                             | 2714 | 16,0                             | 3392  | 19,2                             | 4070  | 22,4                                   |       |      |       |      |
|          | 076      |         |         |          | 172,0     | 15,2                             | 2614 | 19,0                             | 3268  | 22,8                             | 3922  | 26,1                                   |       |      |       |      |
|          | 089      |         |         |          | 141,0     | 17,8                             | 2510 | 22,3                             | 3144  | 26,7                             | 3765  | 30,8                                   |       |      |       |      |
|          | 102      |         |         |          | 122,0     | 20,4                             | 2489 | 25,5                             | 3111  | 30,6                             | 3733  | 36,8                                   |       |      |       |      |
|          | 115      |         |         |          | 107,0     | 23,0                             | 2461 | 28,8                             | 3082  | 34,5                             | 3692  | 41,4                                   |       |      |       |      |
|          | 127      |         |         |          | 93,0      | 25,4                             | 2362 | 31,8                             | 2957  | 38,1                             | 3543  | 44,4                                   |       |      |       |      |
|          | 139      |         |         |          | 86,6      | 27,8                             | 2408 | 34,8                             | 3010  | 41,7                             | 3612  | 48,5                                   |       |      |       |      |
|          | 152      |         |         |          | 78,0      | 30,4                             | 2371 | 38,0                             | 2964  | 45,6                             | 3557  | 54,8                                   |       |      |       |      |
|          | 178      |         |         |          | 67,2      | 35,6                             | 2392 | 44,5                             | 2990  | 53,4                             | 3588  | 63,6                                   |       |      |       |      |
|          | 203      |         |         |          | 59,1      | 40,6                             | 2399 | 50,8                             | 3002  | 60,9                             | 3599  | 72,5                                   |       |      |       |      |
|          | 254      |         |         |          | 46,4      | 50,8                             | 2357 | 63,5                             | 2946  | 76,2                             | 3536  | 92,8                                   |       |      |       |      |
|          | 305      |         |         |          | 38,0      | 61,0                             | 2318 | 76,3                             | 2899  | 91,5                             | 3477  | 112,0                                  |       |      |       |      |
|          | 40       |         |         |          | 051       | 8,4                              | 6,2  | 20,0                             | 350,0 | 10,2                             | 3570  | 12,8                                   | 4480  | 15,3 | 5355  | 17,0 |
|          |          |         |         |          | 064       |                                  |      |                                  | 269,0 | 12,8                             | 3443  | 16,0                                   | 4304  | 19,2 | 5165  | 21,9 |
| 076      |          | 219,0   | 15,2    | 3329     | 19,0      |                                  |      |                                  | 4161  | 22,8                             | 4993  | 26,7                                   |       |      |       |      |
| 089      |          | 190,0   | 17,8    | 3382     | 22,3      |                                  |      |                                  | 4237  | 26,7                             | 5073  | 31,3                                   |       |      |       |      |
| 102      |          | 163,0   | 20,4    | 3325     | 25,5      |                                  |      |                                  | 4157  | 30,6                             | 4988  | 37,1                                   |       |      |       |      |
| 115      |          | 142,0   | 23,0    | 3266     | 28,8      |                                  |      |                                  | 4090  | 34,5                             | 4899  | 41,0                                   |       |      |       |      |
| 127      |          | 128,0   | 25,4    | 3251     | 31,8      |                                  |      |                                  | 4070  | 38,1                             | 4877  | 46,5                                   |       |      |       |      |
| 139      |          | 115,8   | 27,8    | 3220     | 34,8      |                                  |      |                                  | 4025  | 41,7                             | 4830  | 53,1                                   |       |      |       |      |
| 152      |          | 105,0   | 30,4    | 3192     | 38,0      |                                  |      |                                  | 3990  | 45,6                             | 4788  | 56,1                                   |       |      |       |      |
| 178      |          | 89,0    | 35,6    | 3168     | 44,5      |                                  |      |                                  | 3961  | 53,4                             | 4753  | 67,4                                   |       |      |       |      |
| 203      |          | 77,0    | 40,6    | 3126     | 50,8      |                                  |      |                                  | 3912  | 60,9                             | 4689  | 76,2                                   |       |      |       |      |
| 254      |          | 61,0    | 50,8    | 3099     | 63,5      |                                  |      |                                  | 3874  | 76,2                             | 4648  | 96,2                                   |       |      |       |      |
| 305      |          | 51,0    | 61,0    | 3111     | 76,3      |                                  |      |                                  | 3891  | 91,5                             | 4667  | 115,0                                  |       |      |       |      |
| 50       |          | 064     | 11,1    | 7,6      | 25,0      |                                  |      |                                  | 413,0 | 12,8                             | 5286  | 16,0                                   | 6608  | 19,2 | 7930  | 22,4 |
|          | 076      | 339,0   |         |          |           | 15,2                             | 5153 | 19,0                             | 6441  | 22,8                             | 7729  | 26,5                                   |       |      |       |      |
|          | 089      | 288,0   |         |          |           | 17,8                             | 5126 | 22,3                             | 6408  | 26,7                             | 7690  | 31,5                                   |       |      |       |      |
|          | 102      | 245,0   |         |          |           | 20,4                             | 4998 | 25,5                             | 6248  | 30,6                             | 7497  | 37,6                                   |       |      |       |      |
|          | 115      | 215,0   |         |          |           | 23,0                             | 4945 | 28,8                             | 6182  | 34,5                             | 7418  | 42,7                                   |       |      |       |      |
|          | 127      | 192,0   |         |          |           | 25,4                             | 4877 | 31,8                             | 6096  | 38,1                             | 7315  | 47,5                                   |       |      |       |      |
|          | 139      | 169,2   |         |          |           | 27,8                             | 4704 | 34,8                             | 5880  | 41,7                             | 7056  | 51,8                                   |       |      |       |      |
|          | 152      | 154,0   |         |          |           | 30,4                             | 4682 | 38,0                             | 5852  | 45,6                             | 7022  | 57,8                                   |       |      |       |      |
|          | 178      | 134,0   |         |          |           | 35,6                             | 4770 | 44,5                             | 5963  | 53,4                             | 7156  | 68,5                                   |       |      |       |      |
|          | 203      | 117,0   |         |          |           | 40,6                             | 4750 | 50,8                             | 5938  | 60,9                             | 7125  | 77,6                                   |       |      |       |      |
|          | 254      | 89,0    |         |          |           | 50,8                             | 4521 | 63,5                             | 5652  | 76,2                             | 6782  | 97,9                                   |       |      |       |      |
|          | 305      | 73,0    |         |          |           | 61,0                             | 4453 | 76,3                             | 5567  | 91,5                             | 6680  | 121,0                                  |       |      |       |      |
|          | 63       | 076     |         |          |           | 11,6                             | 12,3 | 38,0                             | 618,0 | 15,2                             | 9394  | 19,0                                   | 11742 | 22,8 | 14090 | 24,7 |
|          |          | 089     |         |          |           |                                  |      |                                  | 515,0 | 17,8                             | 9167  | 22,3                                   | 11485 | 26,7 | 13751 | 30,0 |
| 102      |          | 438,0   | 20,4    | 8935     | 25,5      |                                  |      |                                  | 11169 | 30,6                             | 13403 | 35,1                                   |       |      |       |      |
| 115      |          | 370,0   | 23,0    | 8510     | 28,8      |                                  |      |                                  | 10656 | 34,5                             | 12765 | 37,5                                   |       |      |       |      |
| 127      |          | 333,0   | 25,4    | 8458     | 31,8      |                                  |      |                                  | 10589 | 38,1                             | 12687 | 45,9                                   |       |      |       |      |
| 152      |          | 269,0   | 30,4    | 8178     | 38,0      |                                  |      |                                  | 10222 | 45,6                             | 12266 | 56,5                                   |       |      |       |      |
| 178      |          | 226,0   | 35,6    | 8046     | 44,5      |                                  |      |                                  | 10057 | 53,4                             | 12068 | 66,8                                   |       |      |       |      |
| 203      |          | 198,0   | 40,6    | 8039     | 50,8      |                                  |      |                                  | 10058 | 60,9                             | 12058 | 78,8                                   |       |      |       |      |
| 254      |          | 155,0   | 50,8    | 7874     | 63,5      |                                  |      |                                  | 9843  | 76,2                             | 11811 | 102,0                                  |       |      |       |      |
| 305      |          | 128,0   | 61,0    | 7808     | 76,3      |                                  |      |                                  | 9766  | 91,5                             | 11712 | 122,0                                  |       |      |       |      |


[FE]



**FE 834 BB**

 FE 834 BB / 10 x 025



| Dh<br>mm | L0<br>mm | b<br>mm | h<br>mm | Dd<br>mm | C<br>N/mm | 17% Arbeitsweg<br>Working stroke |      | 20% Arbeitsweg<br>Working stroke |       | 25% Arbeitsweg<br>Working stroke |      | max. Federweg<br>max. deflection<br>mm  |      |     |      |     |
|----------|----------|---------|---------|----------|-----------|----------------------------------|------|----------------------------------|-------|----------------------------------|------|--|------|-----|------|-----|
|          |          |         |         |          |           | mm                               | N    | mm                               | N     | mm                               | N    |  |      |     |      |     |
| 10       | 025      | 1,9     | 1,6     | 5,0      | 36,8      | 4,3                              | 158  | 5,0                              | 184   | 6,3                              | 232  | 7,7  |      |     |      |     |
|          | 032      |         |         |          | 27,9      | 5,4                              | 151  | 6,4                              | 179   | 8,0                              | 223  | 10,6   |      |     |      |     |
|          | 038      |         |         |          | 23,7      | 6,5                              | 154  | 7,6                              | 180   | 9,5                              | 225  | 12,6   |      |     |      |     |
|          | 044      |         |         |          | 19,2      | 7,5                              | 144  | 8,8                              | 169   | 11,0                             | 211  | 13,8   |      |     |      |     |
|          | 051      |         |         |          | 16,5      | 8,7                              | 144  | 10,2                             | 168   | 12,8                             | 211  | 16,2   |      |     |      |     |
|          | 064      |         |         |          | 13,2      | 10,9                             | 144  | 12,8                             | 169   | 16,0                             | 211  | 20,4   |      |     |      |     |
|          | 076      |         |         |          | 10,9      | 12,9                             | 141  | 15,2                             | 166   | 19,0                             | 207  | 25,2   |      |     |      |     |
|          | 305      |         |         |          | 2,6       | 51,9                             | 135  | 61,0                             | 159   | 76,3                             | 198  | 111,0  |      |     |      |     |
| 13       | 025      | 2,6     | 2,0     | 6,3      | 58,5      | 4,3                              | 252  | 5,0                              | 293   | 6,3                              | 369  | 8,1  |      |     |      |     |
|          | 032      |         |         |          | 43,9      | 5,4                              | 237  | 6,4                              | 281   | 8,0                              | 351  | 9,9  |      |     |      |     |
|          | 038      |         |         |          | 36,0      | 6,5                              | 234  | 7,6                              | 274   | 9,5                              | 342  | 12,9   |      |     |      |     |
|          | 044      |         |         |          | 30,3      | 7,5                              | 227  | 8,8                              | 267   | 11,0                             | 333  | 14,1   |      |     |      |     |
|          | 051      |         |         |          | 26,2      | 8,7                              | 228  | 10,2                             | 267   | 12,8                             | 335  | 17,4   |      |     |      |     |
|          | 064      |         |         |          | 21,2      | 10,9                             | 231  | 12,8                             | 271   | 16,0                             | 339  | 21,0   |      |     |      |     |
|          | 076      |         |         |          | 17,1      | 12,9                             | 221  | 15,2                             | 260   | 19,0                             | 325  | 26,4   |      |     |      |     |
|          | 089      |         |         |          | 14,5      | 15,1                             | 219  | 17,8                             | 258   | 22,3                             | 323  | 31,5   |      |     |      |     |
|          | 102      |         |         |          | 12,7      | 17,3                             | 220  | 20,4                             | 259   | 25,5                             | 324  | 36,0   |      |     |      |     |
|          | 305      |         |         |          | 4,3       | 51,9                             | 223  | 61,0                             | 262   | 76,3                             | 328  | 111,0  |      |     |      |     |
|          | 16       |         |         |          | 025       | 3,2                              | 2,9  | 8,0                              | 118,0 | 4,3                              | 507  | 5,0  | 590  | 6,3 | 743  | 8,5 |
| 032      |          | 89,0    | 5,4     | 481      | 6,4       |                                  |      |                                  | 570   | 8,0                              | 712  | 11,0   |      |     |      |     |
| 038      |          | 72,1    | 6,5     | 469      | 7,6       |                                  |      |                                  | 548   | 9,5                              | 685  | 13,2   |      |     |      |     |
| 044      |          | 60,9    | 7,5     | 457      | 8,8       |                                  |      |                                  | 536   | 11,0                             | 670  | 14,7   |      |     |      |     |
| 051      |          | 52,3    | 8,7     | 455      | 10,2      |                                  |      |                                  | 533   | 12,8                             | 669  | 17,7   |      |     |      |     |
| 064      |          | 41,2    | 10,9    | 449      | 12,8      |                                  |      |                                  | 527   | 16,0                             | 659  | 21,9   |      |     |      |     |
| 076      |          | 34,1    | 12,9    | 440      | 15,2      |                                  |      |                                  | 518   | 19,0                             | 648  | 27,8   |      |     |      |     |
| 089      |          | 29,5    | 15,1    | 445      | 17,8      |                                  |      |                                  | 525   | 22,3                             | 658  | 31,2   |      |     |      |     |
| 102      |          | 25,6    | 17,3    | 443      | 20,4      |                                  |      |                                  | 522   | 25,5                             | 653  | 37,9   |      |     |      |     |
| 115      |          | 22,4    | 19,6    | 439      | 23,0      |                                  |      |                                  | 515   | 28,8                             | 645  | 44,5   |      |     |      |     |
| 305      |          | 8,4     | 51,9    | 436      | 61,0      |                                  |      |                                  | 512   | 76,3                             | 641  | 113,0  |      |     |      |     |
| 20       |          | 025     | 4,1     | 3,8      | 10,0      |                                  |      |                                  | 293,0 | 4,3                              | 1260 | 5,0  | 1465 | 6,3 | 1846 | 6,9 |
|          |          | 032     |         |          |           |                                  |      |                                  | 224,0 | 5,4                              | 1210 | 6,4  | 1434 | 8,0 | 1792 | 9,4 |
|          | 038      | 177,0   |         |          |           | 6,5                              | 1151 | 7,6                              | 1345  | 9,5                              | 1682 | 12,0   |      |     |      |     |
|          | 044      | 149,0   |         |          |           | 7,5                              | 1118 | 8,8                              | 1311  | 11,0                             | 1639 | 13,5   |      |     |      |     |
|          | 051      | 128,0   |         |          |           | 8,4                              | 1114 | 10,2                             | 1306  | 12,8                             | 1638 | 16,2   |      |     |      |     |
|          | 064      | 99,0    |         |          |           | 10,9                             | 1079 | 12,8                             | 1267  | 16,0                             | 1584 | 21,2   |      |     |      |     |
|          | 076      | 81,7    |         |          |           | 12,9                             | 1054 | 15,2                             | 1242  | 19,0                             | 1552 | 24,7   |      |     |      |     |
|          | 089      | 69,5    |         |          |           | 15,1                             | 1049 | 17,8                             | 1237  | 22,3                             | 1550 | 28,8   |      |     |      |     |
|          | 102      | 60,6    |         |          |           | 17,3                             | 1048 | 20,4                             | 1236  | 25,5                             | 1545 | 34,8   |      |     |      |     |
|          | 115      | 53,0    |         |          |           | 19,6                             | 1039 | 23,0                             | 1219  | 28,8                             | 1526 | 39,0   |      |     |      |     |
|          | 127      | 47,5    |         |          |           | 21,6                             | 1026 | 25,4                             | 1207  | 31,8                             | 1511 | 43,0   |      |     |      |     |
|          | 139      | 43,3    |         |          |           | 23,6                             | 1023 | 27,8                             | 1204  | 34,8                             | 1505 | 45,3   |      |     |      |     |
|          | 152      | 39,0    |         |          |           | 25,8                             | 1006 | 30,4                             | 1186  | 38,0                             | 1482 | 50,4   |      |     |      |     |
|          | 305      | 21,2    |         |          |           | 51,9                             | 1100 | 61,0                             | 1293  | 76,3                             | 1618 | 103,0  |      |     |      |     |
| 25       | 025      | 5,4     | 4,6     | 12,5     | 459,0     | 4,3                              | 1974 | 5,0                              | 2295  | 6,3                              | 2892 | 7,3  |      |     |      |     |
|          | 032      |         |         |          | 374,4     | 5,4                              | 2022 | 6,4                              | 2396  | 8,0                              | 2995 | 10,7   |      |     |      |     |
|          | 038      |         |         |          | 346,0     | 6,5                              | 2249 | 7,6                              | 2630  | 9,5                              | 3287 | 12,0   |      |     |      |     |
|          | 044      |         |         |          | 244,0     | 7,5                              | 1830 | 8,8                              | 2147  | 11,0                             | 2684 | 14,4   |      |     |      |     |
|          | 051      |         |         |          | 207,5     | 8,7                              | 1805 | 10,2                             | 2117  | 12,8                             | 2656 | 17,4   |      |     |      |     |
|          | 064      |         |         |          | 161,0     | 10,9                             | 1755 | 12,8                             | 2061  | 16,0                             | 2576 | 21,4   |      |     |      |     |

[FE]

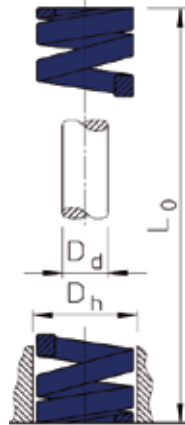


| Dh  | Lo  | b     | h    | Dd    | C     | 17% Arbeitsweg |      | 20% Arbeitsweg |       | 25% Arbeitsweg |       | max. Federweg<br>max. deflection |       |      |       |      |
|-----|-----|-------|------|-------|-------|----------------|------|----------------|-------|----------------|-------|----------------------------------|-------|------|-------|------|
|     |     |       |      |       |       | Working stroke | N    | Working stroke | N     | Working stroke | N     |                                  |       |      |       |      |
| mm  | mm  | mm    | mm   | mm    | N/mm  | mm             | N    | mm             | N     | mm             | N     | mm                               |       |      |       |      |
| 25  | 076 | 5,4   | 4,6  | 12,5  | 130,8 | 12,9           | 1687 | 15,2           | 1988  | 19,0           | 2485  | 26,9                             |       |      |       |      |
|     | 089 |       |      |       | 110,7 | 15,1           | 1663 | 17,8           | 1967  | 22,3           | 2464  | 30,9                             |       |      |       |      |
|     | 102 |       |      |       | 96,3  | 17,3           | 1666 | 20,4           | 1965  | 25,5           | 2456  | 36,7                             |       |      |       |      |
|     | 115 |       |      |       | 85,7  | 19,6           | 1680 | 23,0           | 1971  | 28,8           | 2468  | 40,3                             |       |      |       |      |
|     | 127 |       |      |       | 76,3  | 21,6           | 1648 | 25,4           | 1938  | 31,8           | 2426  | 45,1                             |       |      |       |      |
|     | 139 |       |      |       | 69,4  | 23,6           | 1640 | 27,8           | 1929  | 34,8           | 2412  | 47,6                             |       |      |       |      |
|     | 152 |       |      |       | 63,5  | 25,8           | 1638 | 30,4           | 1930  | 38,0           | 2413  | 53,5                             |       |      |       |      |
|     | 178 |       |      |       | 53,9  | 30,3           | 1633 | 35,6           | 1919  | 44,5           | 2399  | 63,9                             |       |      |       |      |
|     | 203 |       |      |       | 47,0  | 34,5           | 1622 | 40,6           | 1908  | 50,8           | 2388  | 70,2                             |       |      |       |      |
|     | 305 |       |      |       | 30,9  | 51,9           | 1604 | 61,0           | 1885  | 76,3           | 2358  | 110,0                            |       |      |       |      |
| 32  | 038 | 7,3   | 5,9  | 16,0  | 528,2 | 6,5            | 3433 | 7,6            | 4014  | 9,5            | 5018  | 11,4                             |       |      |       |      |
|     | 044 |       |      |       | 424,4 | 7,5            | 3183 | 8,8            | 3735  | 11,0           | 4668  | 13,7                             |       |      |       |      |
|     | 051 |       |      |       | 353,0 | 8,7            | 3071 | 10,2           | 3601  | 12,8           | 4518  | 15,6                             |       |      |       |      |
|     | 064 |       |      |       | 269,2 | 10,9           | 2934 | 12,8           | 3446  | 16,0           | 4307  | 20,0                             |       |      |       |      |
|     | 076 |       |      |       | 218,5 | 12,9           | 2819 | 15,2           | 3321  | 19,0           | 4152  | 24,4                             |       |      |       |      |
|     | 089 |       |      |       | 180,3 | 15,1           | 2723 | 17,8           | 3209  | 22,3           | 4021  | 29,7                             |       |      |       |      |
|     | 102 |       |      |       | 155,0 | 17,3           | 2682 | 20,4           | 3162  | 25,5           | 3953  | 35,1                             |       |      |       |      |
|     | 115 |       |      |       | 140,0 | 19,6           | 2744 | 23,0           | 3220  | 28,8           | 4032  | 39,0                             |       |      |       |      |
|     | 127 |       |      |       | 124,0 | 21,6           | 2678 | 25,4           | 3150  | 31,8           | 3943  | 42,8                             |       |      |       |      |
|     | 139 |       |      |       | 113,1 | 23,6           | 2673 | 27,8           | 3144  | 34,8           | 3931  | 48,6                             |       |      |       |      |
|     | 152 |       |      |       | 102,0 | 25,8           | 2632 | 30,4           | 3101  | 38,0           | 3876  | 52,4                             |       |      |       |      |
|     | 178 |       |      |       | 88,2  | 30,3           | 2672 | 35,6           | 3140  | 44,5           | 3925  | 60,9                             |       |      |       |      |
|     | 203 |       |      |       | 76,0  | 34,5           | 2622 | 40,6           | 3086  | 50,8           | 3861  | 69,2                             |       |      |       |      |
|     | 254 |       |      |       | 60,8  | 43,2           | 2627 | 50,8           | 3089  | 63,5           | 3861  | 88,1                             |       |      |       |      |
|     | 305 |       |      |       | 49,0  | 51,9           | 2543 | 61,0           | 2989  | 76,3           | 3739  | 104,0                            |       |      |       |      |
|     | 40  |       |      |       | 051   | 8,4            | 7,5  | 20,0           | 628,0 | 8,7            | 5464  | 10,2                             | 6406  | 12,8 | 8038  | 15,0 |
| 064 |     | 487,0 | 10,9 | 5308  | 12,8  |                |      |                | 6234  | 16,0           | 7792  | 19,5                             |       |      |       |      |
| 076 |     | 379,0 | 12,9 | 4889  | 15,2  |                |      |                | 5761  | 19,0           | 7201  | 23,3                             |       |      |       |      |
| 089 |     | 321,0 | 15,1 | 4847  | 17,8  |                |      |                | 5714  | 22,3           | 7158  | 26,7                             |       |      |       |      |
| 102 |     | 281,0 | 17,3 | 4861  | 20,4  |                |      |                | 5732  | 25,5           | 7166  | 33,8                             |       |      |       |      |
| 115 |     | 245,0 | 19,6 | 4802  | 23,0  |                |      |                | 5635  | 28,8           | 7056  | 36,2                             |       |      |       |      |
| 127 |     | 221,0 | 21,6 | 4774  | 25,4  |                |      |                | 5613  | 31,8           | 7028  | 40,7                             |       |      |       |      |
| 139 |     | 191,4 | 23,6 | 4522  | 27,8  |                |      |                | 5320  | 34,8           | 6650  | 44,5                             |       |      |       |      |
| 152 |     | 168,0 | 25,8 | 4334  | 30,4  |                |      |                | 5107  | 38,0           | 6384  | 49,6                             |       |      |       |      |
| 178 |     | 146,0 | 30,3 | 4424  | 35,6  |                |      |                | 5198  | 44,5           | 6497  | 59,9                             |       |      |       |      |
| 203 |     | 132,0 | 34,5 | 4554  | 40,6  |                |      |                | 5359  | 50,8           | 6706  | 67,1                             |       |      |       |      |
| 254 |     | 107,0 | 43,2 | 4622  | 50,8  |                |      |                | 5436  | 63,5           | 6795  | 86,3                             |       |      |       |      |
| 305 |     | 87,8  | 51,9 | 4557  | 61,0  |                |      |                | 5356  | 76,3           | 6699  | 104,0                            |       |      |       |      |
| 50  |     | 064   | 11,5 | 9,0   | 25,0  |                |      |                | 709,0 | 10,9           | 7728  | 12,8                             | 9075  | 16,0 | 11344 | 19,3 |
|     | 076 | 572,0 |      |       |       | 12,9           | 7379 | 15,2           | 8694  | 19,0           | 10868 | 24,2                             |       |      |       |      |
|     | 089 | 475,0 |      |       |       | 15,1           | 7173 | 17,8           | 8455  | 22,3           | 10593 | 28,0                             |       |      |       |      |
|     | 102 | 405,0 |      |       |       | 17,3           | 7007 | 20,4           | 8262  | 25,5           | 10328 | 33,5                             |       |      |       |      |
|     | 115 | 352,0 |      |       |       | 19,6           | 6899 | 23,0           | 8096  | 28,8           | 10138 | 38,6                             |       |      |       |      |
|     | 127 | 316,0 |      |       |       | 21,6           | 6826 | 25,4           | 8026  | 31,8           | 10049 | 41,4                             |       |      |       |      |
|     | 139 | 276,0 |      |       |       | 23,6           | 6521 | 27,8           | 7672  | 34,8           | 9590  | 47,3                             |       |      |       |      |
|     | 152 | 239,0 |      |       |       | 25,8           | 6166 | 30,4           | 7266  | 38,0           | 9082  | 50,2                             |       |      |       |      |
|     | 178 | 215,0 |      |       |       | 30,3           | 6515 | 35,6           | 7654  | 44,5           | 9568  | 61,1                             |       |      |       |      |
|     | 203 | 187,0 |      |       |       | 34,5           | 6452 | 40,6           | 7592  | 50,8           | 9500  | 67,7                             |       |      |       |      |
|     | 254 | 153,0 |      |       |       | 43,5           | 6610 | 50,8           | 7772  | 63,5           | 9716  | 87,0                             |       |      |       |      |
|     | 305 | 127,0 |      |       |       | 51,9           | 6591 | 61,0           | 7747  | 76,3           | 9690  | 104,0                            |       |      |       |      |
|     | 63  | 076*  |      |       |       | 11,6           | 14,9 | 38,0           | 952,0 | 12,9           | 12280 | 15,2                             | 14470 | -    | -     | 15,5 |
|     |     | 089*  |      |       |       |                |      |                | 819,0 | 15,1           | 12360 | 17,8                             | 14580 | -    | -     | 20,0 |
| 102 |     | 700,0 | 17,3 | 12110 | 20,4  |                |      |                | 14280 | 25,5           | 17850 | 30,7                             |       |      |       |      |
| 115 |     | 620,0 | 19,6 | 12152 | 23,0  |                |      |                | 14260 | 28,8           | 17860 | 34,9                             |       |      |       |      |
| 127 |     | 565,0 | 21,6 | 12204 | 25,4  |                |      |                | 14351 | 31,8           | 17967 | 38,0                             |       |      |       |      |
| 152 |     | 458,0 | 25,8 | 11816 | 30,4  |                |      |                | 13923 | 38,0           | 17404 | 47,2                             |       |      |       |      |
| 178 |     | 384,0 | 30,3 | 11635 | 35,6  |                |      |                | 13670 | 44,5           | 17088 | 55,8                             |       |      |       |      |
| 203 |     | 337,0 | 34,5 | 11627 | 40,6  |                |      |                | 13682 | 50,8           | 17120 | 64,8                             |       |      |       |      |
| 254 |     | 263,0 | 43,2 | 11362 | 50,8  |                |      |                | 13360 | 63,5           | 16701 | 86,7                             |       |      |       |      |
| 305 |     | 218,0 | 51,9 | 11314 | 61,0  |                |      |                | 13298 | 76,3           | 16633 | 106,0                            |       |      |       |      |

\* = max. Federweg 20% / \* = max. spring deflection 20%

**FE 835 LB**

 **FE 835 LB / 10 x 025**



| Dh<br>mm | Lo<br>mm | Dd<br>mm | C<br>N/mm | 25% Arbeitsweg<br>Working stroke |      | 40% Arbeitsweg<br>Working stroke |      | 50% Arbeitsweg<br>Working stroke |      |
|----------|----------|----------|-----------|----------------------------------|------|----------------------------------|------|----------------------------------|------|
|          |          |          |           | mm                               | N    | mm                               | N    | mm                               | N    |
| 10       | 025      | 5,0      | 14,4      | 6,3                              | 90   | 10,0                             | 144  | 12,5                             | 180  |
|          | 032      |          | 12,3      | 8,0                              | 99   | 12,8                             | 158  | 16,0                             | 197  |
|          | 038      |          | 9,8       | 9,5                              | 93   | 15,2                             | 149  | 19,0                             | 186  |
|          | 044      |          | 8,8       | 11,0                             | 97   | 17,6                             | 155  | 22,0                             | 194  |
|          | 051      |          | 7,5       | 12,8                             | 96   | 20,4                             | 153  | 25,5                             | 191  |
|          | 064      |          | 4,9       | 16,0                             | 79   | 25,6                             | 126  | 32,0                             | 157  |
|          | 076      |          | 3,8       | 19,0                             | 72   | 30,4                             | 115  | 38,0                             | 144  |
|          | 305      |          | 1,2       | 76,3                             | 92   | 122,0                            | 146  | 152,5                            | 183  |
| 13       | 025      | 6,3      | 18,9      | 6,3                              | 118  | 10,0                             | 189  | 12,5                             | 236  |
|          | 032      |          | 15,4      | 8,0                              | 123  | 12,8                             | 197  | 16,0                             | 246  |
|          | 038      |          | 13,5      | 9,5                              | 129  | 15,2                             | 206  | 19,0                             | 257  |
|          | 044      |          | 11,8      | 11,0                             | 130  | 17,6                             | 208  | 22,0                             | 260  |
|          | 051      |          | 10,0      | 12,8                             | 128  | 20,4                             | 204  | 25,5                             | 255  |
|          | 064      |          | 7,6       | 16,0                             | 122  | 25,6                             | 194  | 32,0                             | 243  |
|          | 076      |          | 5,9       | 19,0                             | 112  | 30,4                             | 179  | 38,0                             | 224  |
|          | 089      |          | 4,8       | 22,3                             | 107  | 35,6                             | 171  | 44,5                             | 214  |
|          | 102      |          | 3,4       | 25,5                             | 87   | 40,8                             | 138  | 51,0                             | 173  |
|          | 305      |          | 1,6       | 76,3                             | 122  | 122,0                            | 195  | 152,5                            | 244  |
| 16       | 025      | 8,0      | 22,9      | 6,3                              | 143  | 10,0                             | 229  | 12,5                             | 286  |
|          | 032      |          | 22,5      | 8,0                              | 180  | 12,8                             | 288  | 16,0                             | 360  |
|          | 038      |          | 18,9      | 9,5                              | 180  | 15,2                             | 287  | 19,0                             | 359  |
|          | 044      |          | 16,8      | 11,0                             | 185  | 17,6                             | 296  | 22,0                             | 370  |
|          | 051      |          | 15,4      | 12,8                             | 197  | 20,4                             | 314  | 25,5                             | 393  |
|          | 064      |          | 10,5      | 16,0                             | 168  | 25,6                             | 269  | 32,0                             | 336  |
|          | 076      |          | 9,8       | 19,0                             | 186  | 30,4                             | 298  | 38,0                             | 372  |
|          | 089      |          | 8,4       | 22,3                             | 187  | 35,6                             | 299  | 44,5                             | 374  |
|          | 102      |          | 7,7       | 25,5                             | 197  | 40,8                             | 314  | 51,0                             | 393  |
|          | 115      |          | 5,9       | 28,8                             | 170  | 46,0                             | 271  | 57,5                             | 339  |
|          | 305      |          | 2,5       | 76,3                             | 191  | 122,0                            | 305  | 152,5                            | 381  |
|          | 20       |          | 025       | 10,0                             | 53,0 | 6,3                              | 332  | 10,0                             | 530  |
| 032      |          | 43,1     | 8,0       |                                  | 345  | 12,8                             | 552  | 16,0                             | 690  |
| 038      |          | 34,3     | 9,5       |                                  | 326  | 15,2                             | 522  | 19,0                             | 652  |
| 044      |          | 30,4     | 11,0      |                                  | 335  | 17,6                             | 535  | 22,0                             | 669  |
| 051      |          | 25,5     | 12,8      |                                  | 325  | 20,4                             | 520  | 25,5                             | 650  |
| 064      |          | 20,6     | 16,0      |                                  | 330  | 25,6                             | 527  | 32,0                             | 659  |
| 076      |          | 16,2     | 19,0      |                                  | 308  | 30,4                             | 493  | 38,0                             | 616  |
| 089      |          | 14,2     | 22,3      |                                  | 316  | 35,6                             | 506  | 44,5                             | 632  |
| 102      |          | 12,2     | 25,5      |                                  | 311  | 40,8                             | 498  | 51,0                             | 622  |
| 115      |          | 11,0     | 28,8      |                                  | 317  | 46,0                             | 506  | 57,5                             | 633  |
| 127      |          | 9,8      | 31,8      |                                  | 311  | 50,8                             | 498  | 63,5                             | 622  |
| 140      |          | 8,3      | 35,0      |                                  | 291  | 56,0                             | 465  | 70,0                             | 581  |
| 152      |          | 7,2      | 38,0      |                                  | 274  | 60,8                             | 438  | 76,0                             | 547  |
| 305      |          | 4,1      | 76,3      |                                  | 313  | 122,0                            | 500  | 152,5                            | 625  |
| 25       | 025      | 12,5     | 107,9     | 6,3                              | 675  | 10,0                             | 1079 | 12,5                             | 1349 |
|          | 032      |          | 80,4      | 8,0                              | 643  | 12,8                             | 1029 | 16,0                             | 1286 |
|          | 038      |          | 62,8      | 9,5                              | 597  | 15,2                             | 954  | 19,0                             | 1193 |
|          | 044      |          | 52,0      | 11,0                             | 572  | 17,6                             | 915  | 22,0                             | 1144 |
|          | 051      |          | 43,1      | 12,8                             | 550  | 20,4                             | 879  | 25,5                             | 1099 |
|          | 064      |          | 35,3      | 16,0                             | 565  | 25,6                             | 904  | 32,0                             | 1130 |

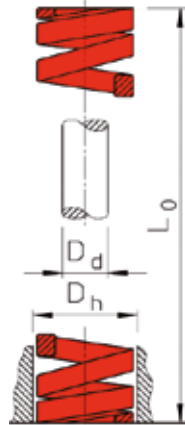
[FE]



| Dh<br>mm | Lo<br>mm | Dd<br>mm | C<br>N/mm | 25% Arbeitsweg<br>Working stroke |       | 40% Arbeitsweg<br>Working stroke |      | 50% Arbeitsweg<br>Working stroke |      |
|----------|----------|----------|-----------|----------------------------------|-------|----------------------------------|------|----------------------------------|------|
|          |          |          |           | mm                               | N     | mm                               | N    | mm                               | N    |
| 25       | 076      | 12,5     | 29,4      | 19,0                             | 559   | 30,4                             | 894  | 38,0                             | 1117 |
|          | 089      |          | 24,5      | 22,3                             | 545   | 35,6                             | 872  | 44,5                             | 1090 |
|          | 102      |          | 21,6      | 25,5                             | 551   | 40,8                             | 882  | 51,0                             | 1102 |
|          | 115      |          | 18,6      | 28,8                             | 535   | 46,0                             | 856  | 57,5                             | 1070 |
|          | 127      |          | 17,2      | 31,8                             | 546   | 50,8                             | 874  | 63,5                             | 1092 |
|          | 140      |          | 15,7      | 35,0                             | 550   | 56,0                             | 879  | 70,0                             | 1099 |
|          | 152      |          | 14,7      | 38,0                             | 559   | 60,8                             | 894  | 76,0                             | 1117 |
|          | 178      |          | 12,7      | 44,5                             | 565   | 71,2                             | 904  | 89,0                             | 1130 |
|          | 203      |          | 10,8      | 50,8                             | 548   | 81,2                             | 877  | 101,5                            | 1096 |
|          | 305      |          | 7,4       | 76,3                             | 565   | 122,0                            | 903  | 152,5                            | 1129 |
| 32       | 038      | 16,0     | 88,3      | 9,5                              | 839   | 15,2                             | 1342 | 19,0                             | 1678 |
|          | 044      |          | 76,5      | 11,0                             | 842   | 17,6                             | 1346 | 22,0                             | 1683 |
|          | 051      |          | 60,8      | 12,8                             | 775   | 20,4                             | 1240 | 25,5                             | 1550 |
|          | 064      |          | 49,0      | 16,0                             | 784   | 25,6                             | 1254 | 32,0                             | 1568 |
|          | 076      |          | 41,2      | 19,0                             | 783   | 30,4                             | 1253 | 38,0                             | 1566 |
|          | 089      |          | 35,3      | 22,3                             | 786   | 35,6                             | 1257 | 44,5                             | 1571 |
|          | 102      |          | 30,4      | 25,5                             | 775   | 40,8                             | 1240 | 51,0                             | 1550 |
|          | 115      |          | 27,5      | 28,8                             | 791   | 46,0                             | 1265 | 57,5                             | 1581 |
|          | 127      |          | 23,5      | 31,8                             | 746   | 50,8                             | 1194 | 63,5                             | 1492 |
|          | 140      |          | 21,6      | 35,0                             | 756   | 56,0                             | 1210 | 70,0                             | 1512 |
|          | 152      |          | 19,6      | 38,0                             | 745   | 60,8                             | 1192 | 76,0                             | 1490 |
|          | 178      |          | 17,7      | 44,5                             | 788   | 71,2                             | 1260 | 89,0                             | 1575 |
|          | 203      |          | 14,7      | 50,8                             | 746   | 81,2                             | 1194 | 101,5                            | 1492 |
|          | 254      |          | 12,7      | 63,5                             | 807   | 101,6                            | 1290 | 127,0                            | 1613 |
|          | 305      |          | 9,8       | 76,3                             | 748   | 122,0                            | 1196 | 152,5                            | 1495 |
|          | 40       |          | 051       | 20,0                             | 81,4  | 12,8                             | 1038 | 20,4                             | 1661 |
| 064      |          | 62,8     | 16,0      |                                  | 1005  | 25,6                             | 1608 | 32,0                             | 2010 |
| 076      |          | 51,0     | 19,0      |                                  | 969   | 30,4                             | 1550 | 38,0                             | 1938 |
| 089      |          | 43,1     | 22,3      |                                  | 959   | 35,6                             | 1534 | 44,5                             | 1918 |
| 102      |          | 36,3     | 25,5      |                                  | 926   | 40,8                             | 1481 | 51,0                             | 1851 |
| 115      |          | 32,4     | 28,8      |                                  | 932   | 46,0                             | 1490 | 57,5                             | 1863 |
| 127      |          | 29,4     | 31,8      |                                  | 934   | 50,8                             | 1494 | 63,5                             | 1867 |
| 140      |          | 27,0     | 35,0      |                                  | 945   | 56,0                             | 1512 | 70,0                             | 1890 |
| 152      |          | 24,5     | 38,0      |                                  | 931   | 60,8                             | 1490 | 76,0                             | 1862 |
| 178      |          | 21,6     | 44,5      |                                  | 961   | 71,2                             | 1538 | 89,0                             | 1922 |
| 203      |          | 18,6     | 50,8      |                                  | 944   | 81,2                             | 1510 | 101,5                            | 1888 |
| 254      |          | 14,7     | 63,5      |                                  | 934   | 101,6                            | 1494 | 127,0                            | 1867 |
| 305      |          | 10,8     | 76,3      |                                  | 824   | 122,0                            | 1318 | 152,5                            | 1647 |
| 50       |          | 064      | 25,0      |                                  | 156,9 | 16,0                             | 2511 | 25,6                             | 4017 |
|          | 076      | 132,4    |           | 19,0                             | 2516  | 30,4                             | 4025 | 38,0                             | 5031 |
|          | 089      | 114,7    |           | 22,3                             | 2552  | 35,6                             | 4083 | 44,5                             | 5104 |
|          | 102      | 98,1     |           | 25,5                             | 2502  | 40,8                             | 4002 | 51,0                             | 5003 |
|          | 115      | 87,3     |           | 28,8                             | 2510  | 46,0                             | 4016 | 57,5                             | 5020 |
|          | 127      | 77,5     |           | 31,8                             | 2461  | 50,8                             | 3937 | 63,5                             | 4921 |
|          | 140      | 69,6     |           | 35,0                             | 2436  | 56,0                             | 3898 | 70,0                             | 4872 |
|          | 152      | 64,7     |           | 38,0                             | 2459  | 60,8                             | 3934 | 76,0                             | 4917 |
|          | 178      | 53,0     |           | 44,5                             | 2359  | 71,2                             | 3774 | 89,0                             | 4717 |
|          | 203      | 47,1     |           | 50,8                             | 2391  | 81,2                             | 3825 | 101,5                            | 4781 |
|          | 254      | 37,5     |           | 63,5                             | 2382  | 101,6                            | 3810 | 127,0                            | 4763 |
|          | 305      | 31,4     |           | 76,3                             | 2395  | 122,0                            | 3831 | 152,5                            | 4789 |

**FE 836 MB**

 FE 836 MB / 10 x 025



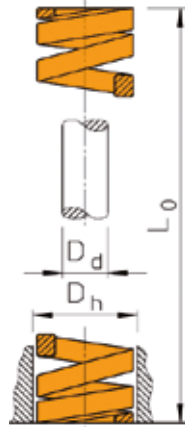
| Dh<br>mm | Lo<br>mm | Dd<br>mm | C<br>N/mm | 20% Arbeitsweg<br>Working stroke |      | 25% Arbeitsweg<br>Working stroke |     | 37% Arbeitsweg<br>Working stroke |      |
|----------|----------|----------|-----------|----------------------------------|------|----------------------------------|-----|----------------------------------|------|
|          |          |          |           | mm                               | N    | mm                               | N   | mm                               | N    |
| 10       | 025      | 5,0      | 17,8      | 5,0                              | 89   | 6,3                              | 111 | 9,3                              | 165  |
|          | 032      |          | 15,1      | 6,4                              | 97   | 8,0                              | 121 | 11,8                             | 179  |
|          | 038      |          | 13,2      | 7,6                              | 101  | 9,5                              | 126 | 14,1                             | 186  |
|          | 044      |          | 11,3      | 8,8                              | 99   | 11,0                             | 124 | 16,3                             | 184  |
|          | 051      |          | 8,4       | 10,2                             | 86   | 12,8                             | 107 | 18,9                             | 159  |
|          | 064      |          | 7,2       | 12,8                             | 92   | 16,0                             | 116 | 23,7                             | 171  |
|          | 076      |          | 5,8       | 15,2                             | 88   | 19,0                             | 110 | 28,1                             | 163  |
|          | 305      |          | 1,5       | 61,0                             | 91   | 76,3                             | 114 | 112,9                            | 169  |
| 13       | 025      | 6,3      | 30,6      | 5,0                              | 153  | 6,3                              | 191 | 9,3                              | 283  |
|          | 032      |          | 22,0      | 6,4                              | 141  | 8,0                              | 176 | 11,8                             | 261  |
|          | 038      |          | 19,1      | 7,6                              | 145  | 9,5                              | 182 | 14,1                             | 269  |
|          | 044      |          | 16,1      | 8,8                              | 142  | 11,0                             | 177 | 16,3                             | 262  |
|          | 051      |          | 15,1      | 10,2                             | 154  | 12,8                             | 192 | 18,9                             | 284  |
|          | 064      |          | 11,8      | 12,8                             | 151  | 16,0                             | 189 | 23,7                             | 280  |
|          | 076      |          | 9,8       | 15,2                             | 149  | 19,0                             | 186 | 28,1                             | 275  |
|          | 089      |          | 8,1       | 17,8                             | 144  | 22,3                             | 180 | 32,9                             | 266  |
|          | 102      |          | 6,3       | 20,4                             | 129  | 25,5                             | 161 | 37,7                             | 238  |
|          | 305      |          | 2,1       | 61,0                             | 128  | 76,3                             | 160 | 112,9                            | 237  |
| 16       | 025      | 8,0      | 57,1      | 5,0                              | 285  | 6,3                              | 357 | 9,3                              | 528  |
|          | 032      |          | 38,1      | 6,4                              | 244  | 8,0                              | 305 | 11,8                             | 451  |
|          | 038      |          | 33,4      | 7,6                              | 254  | 9,5                              | 318 | 14,1                             | 470  |
|          | 044      |          | 29,2      | 8,8                              | 257  | 11,0                             | 322 | 16,3                             | 476  |
|          | 051      |          | 25,5      | 10,2                             | 261  | 12,8                             | 326 | 18,9                             | 482  |
|          | 064      |          | 19,6      | 12,8                             | 251  | 16,0                             | 314 | 23,7                             | 464  |
|          | 076      |          | 16,2      | 15,2                             | 246  | 19,0                             | 307 | 28,1                             | 455  |
|          | 089      |          | 13,7      | 17,8                             | 244  | 22,3                             | 305 | 32,9                             | 451  |
|          | 102      |          | 12,7      | 20,4                             | 259  | 25,5                             | 324 | 37,7                             | 479  |
|          | 115      |          | 10,3      | 23,0                             | 237  | 28,8                             | 297 | 42,6                             | 439  |
|          | 305      |          | 3,9       | 61,0                             | 238  | 76,3                             | 297 | 112,9                            | 440  |
|          | 20       |          | 025       | 10,0                             | 99,6 | 5,0                              | 498 | 6,3                              | 622  |
| 032      |          | 77,3     | 6,4       |                                  | 495  | 8,0                              | 618 | 11,8                             | 915  |
| 038      |          | 56,0     | 7,6       |                                  | 426  | 9,5                              | 532 | 14,1                             | 788  |
| 044      |          | 50,1     | 8,8       |                                  | 441  | 11,0                             | 551 | 16,3                             | 815  |
| 051      |          | 42,3     | 10,2      |                                  | 431  | 12,8                             | 539 | 18,9                             | 798  |
| 064      |          | 33,3     | 12,8      |                                  | 426  | 16,0                             | 533 | 23,7                             | 789  |
| 076      |          | 25,0     | 15,2      |                                  | 380  | 19,0                             | 475 | 28,1                             | 703  |
| 089      |          | 23,1     | 17,8      |                                  | 411  | 22,3                             | 514 | 32,9                             | 760  |
| 102      |          | 20,6     | 20,4      |                                  | 420  | 25,5                             | 525 | 37,7                             | 777  |
| 115      |          | 18,6     | 23,0      |                                  | 428  | 28,8                             | 535 | 42,6                             | 792  |
| 127      |          | 17,7     | 25,4      |                                  | 450  | 31,8                             | 562 | 47,0                             | 832  |
| 140      |          | 16,2     | 28,0      |                                  | 454  | 35,0                             | 567 | 51,8                             | 839  |
| 152      |          | 13,9     | 30,4      |                                  | 422  | 38,0                             | 528 | 56,2                             | 781  |
| 305      |          | 6,5      | 61,0      |                                  | 394  | 76,3                             | 493 | 112,9                            | 729  |
| 25       | 025      | 12,5     | 138,1     | 5,0                              | 690  | 6,3                              | 863 | 9,3                              | 1277 |
|          | 032      |          | 105,6     | 6,4                              | 676  | 8,0                              | 845 | 11,8                             | 1250 |
|          | 038      |          | 88,5      | 7,6                              | 673  | 9,5                              | 841 | 14,1                             | 1245 |
|          | 044      |          | 76,6      | 8,8                              | 674  | 11,0                             | 843 | 16,3                             | 1247 |
|          | 051      |          | 63,8      | 10,2                             | 651  | 12,8                             | 814 | 18,9                             | 1204 |
|          | 064      |          | 49,0      | 12,8                             | 628  | 16,0                             | 784 | 23,7                             | 1161 |



| Dh<br>mm | Lo<br>mm | Dd<br>mm | C<br>N/mm | 20% Arbeitsweg<br>Working stroke |       | 25% Arbeitsweg<br>Working stroke |      | 37% Arbeitsweg<br>Working stroke |      |
|----------|----------|----------|-----------|----------------------------------|-------|----------------------------------|------|----------------------------------|------|
|          |          |          |           | mm                               | N     | mm                               | N    | mm                               | N    |
| 25       | 076      | 12,5     | 41,7      | 15,2                             | 634   | 19,0                             | 792  | 28,1                             | 1172 |
|          | 089      |          | 35,8      | 17,8                             | 637   | 22,3                             | 796  | 32,9                             | 1178 |
|          | 102      |          | 31,9      | 20,4                             | 650   | 25,5                             | 813  | 37,7                             | 1203 |
|          | 115      |          | 27,0      | 23,0                             | 622   | 28,8                             | 777  | 42,6                             | 1150 |
|          | 127      |          | 24,5      | 25,4                             | 623   | 31,8                             | 778  | 47,0                             | 1152 |
|          | 140      |          | 22,6      | 28,0                             | 633   | 35,0                             | 791  | 51,8                             | 1171 |
|          | 152      |          | 19,6      | 30,4                             | 596   | 38,0                             | 745  | 56,2                             | 1102 |
|          | 178      |          | 17,7      | 35,6                             | 630   | 44,5                             | 788  | 65,9                             | 1166 |
|          | 203      |          | 15,7      | 40,6                             | 637   | 50,8                             | 797  | 75,1                             | 1179 |
|          | 305      |          | 10,8      | 61,0                             | 659   | 76,3                             | 824  | 112,9                            | 1219 |
| 32       | 038      | 16,0     | 196,7     | 7,6                              | 1495  | 9,5                              | 1868 | 14,1                             | 2765 |
|          | 044      |          | 176,7     | 8,8                              | 1555  | 11,0                             | 1944 | 16,3                             | 2877 |
|          | 051      |          | 147,3     | 10,2                             | 1503  | 12,8                             | 1878 | 18,9                             | 2780 |
|          | 064      |          | 108,0     | 12,8                             | 1382  | 16,0                             | 1728 | 23,7                             | 2557 |
|          | 076      |          | 90,1      | 15,2                             | 1370  | 19,0                             | 1713 | 28,1                             | 2535 |
|          | 089      |          | 74,4      | 17,8                             | 1325  | 22,3                             | 1656 | 32,9                             | 2451 |
|          | 102      |          | 64,6      | 20,4                             | 1318  | 25,5                             | 1648 | 37,7                             | 2439 |
|          | 115      |          | 56,0      | 23,0                             | 1287  | 28,8                             | 1609 | 42,6                             | 2381 |
|          | 127      |          | 47,1      | 25,4                             | 1197  | 31,8                             | 1496 | 47,0                             | 2214 |
|          | 140      |          | 44,1      | 28,0                             | 1235  | 35,0                             | 1543 | 51,8                             | 2284 |
|          | 152      |          | 40,7      | 30,4                             | 1236  | 38,0                             | 1545 | 56,2                             | 2287 |
|          | 178      |          | 34,3      | 35,6                             | 1222  | 44,5                             | 1527 | 65,9                             | 2260 |
|          | 203      |          | 31,4      | 40,6                             | 1275  | 50,8                             | 1593 | 75,1                             | 2358 |
|          | 254      |          | 22,1      | 50,8                             | 1123  | 63,5                             | 1403 | 94,0                             | 2077 |
|          | 305      |          | 20,6      | 61,0                             | 1257  | 76,3                             | 1572 | 112,9                            | 2326 |
|          | 40       |          | 051       | 20,0                             | 178,8 | 10,2                             | 1824 | 12,8                             | 2280 |
| 064      |          | 132,5    | 12,8      |                                  | 1696  | 16,0                             | 2120 | 23,7                             | 3138 |
| 076      |          | 107,8    | 15,2      |                                  | 1639  | 19,0                             | 2049 | 28,1                             | 3032 |
| 089      |          | 94,0     | 17,8      |                                  | 1674  | 22,3                             | 2092 | 32,9                             | 3096 |
| 102      |          | 82,3     | 20,4      |                                  | 1679  | 25,5                             | 2099 | 37,7                             | 3106 |
| 115      |          | 73,8     | 23,0      |                                  | 1697  | 28,8                             | 2122 | 42,6                             | 3140 |
| 127      |          | 62,8     | 25,4      |                                  | 1596  | 31,8                             | 1995 | 47,0                             | 2952 |
| 140      |          | 58,8     | 28,0      |                                  | 1646  | 35,0                             | 2058 | 51,8                             | 3046 |
| 152      |          | 52,0     | 30,4      |                                  | 1579  | 38,0                             | 1974 | 56,2                             | 2922 |
| 178      |          | 44,1     | 35,6      |                                  | 1571  | 44,5                             | 1964 | 65,9                             | 2906 |
| 203      |          | 37,3     | 40,6      |                                  | 1514  | 50,8                             | 1893 | 75,1                             | 2801 |
| 254      |          | 31,4     | 50,8      |                                  | 1596  | 63,5                             | 1995 | 94,0                             | 2952 |
| 305      |          | 24,5     | 61,0      |                                  | 1495  | 76,3                             | 1869 | 112,9                            | 2766 |
| 50       |          | 064      | 25,0      |                                  | 211,0 | 12,8                             | 2701 | 16,0                             | 3376 |
|          | 076      | 171,5    |           | 15,2                             | 2606  | 19,0                             | 3258 | 28,1                             | 4822 |
|          | 089      | 142,1    |           | 17,8                             | 2529  | 22,3                             | 3161 | 32,9                             | 4678 |
|          | 102      | 119,5    |           | 20,4                             | 2437  | 25,5                             | 3047 | 37,7                             | 4509 |
|          | 115      | 108,0    |           | 23,0                             | 2485  | 28,8                             | 3106 | 42,6                             | 4597 |
|          | 127      | 100,0    |           | 25,4                             | 2541  | 31,8                             | 3176 | 47,0                             | 4700 |
|          | 140      | 90,2     |           | 28,0                             | 2525  | 35,0                             | 3157 | 51,8                             | 4672 |
|          | 152      | 84,2     |           | 30,4                             | 2561  | 38,0                             | 3201 | 56,2                             | 4738 |
|          | 178      | 71,1     |           | 35,6                             | 2532  | 44,5                             | 3166 | 65,9                             | 4685 |
|          | 203      | 61,8     |           | 40,6                             | 2509  | 50,8                             | 3136 | 75,1                             | 4641 |
|          | 254      | 49,5     |           | 50,8                             | 2515  | 63,5                             | 3144 | 94,0                             | 4653 |
|          | 305      | 43,1     |           | 61,0                             | 2630  | 76,3                             | 3288 | 112,9                            | 4866 |

**FE 837 SB**

 **FE 837 SB / 10 x 025**



| Dh<br>mm | L0<br>mm | Dd<br>mm | C<br>N/mm | 15% Arbeitsweg<br>Working stroke |       | 20% Arbeitsweg<br>Working stroke |      | 30% Arbeitsweg<br>Working stroke |      |
|----------|----------|----------|-----------|----------------------------------|-------|----------------------------------|------|----------------------------------|------|
|          |          |          |           | mm                               | N     | mm                               | N    | mm                               | N    |
| 10       | 025      | 5,0      | 22,5      | 3,8                              | 85    | 5,0                              | 113  | 7,5                              | 169  |
|          | 032      |          | 18,6      | 4,8                              | 90    | 6,4                              | 119  | 9,6                              | 179  |
|          | 038      |          | 15,9      | 5,7                              | 91    | 7,6                              | 121  | 11,4                             | 181  |
|          | 044      |          | 13,7      | 6,6                              | 91    | 8,8                              | 121  | 13,2                             | 181  |
|          | 051      |          | 11,8      | 7,7                              | 90    | 10,2                             | 120  | 15,3                             | 180  |
|          | 064      |          | 8,8       | 9,6                              | 85    | 12,8                             | 113  | 19,2                             | 169  |
|          | 076      |          | 6,4       | 11,4                             | 73    | 15,2                             | 97   | 22,8                             | 146  |
|          | 305      |          | 1,7       | 45,8                             | 78    | 61,0                             | 104  | 91,5                             | 156  |
| 13       | 025      | 6,3      | 37,3      | 3,8                              | 140   | 5,0                              | 187  | 7,5                              | 280  |
|          | 032      |          | 32,5      | 4,8                              | 156   | 6,4                              | 208  | 9,6                              | 312  |
|          | 038      |          | 28,4      | 5,7                              | 162   | 7,6                              | 216  | 11,4                             | 324  |
|          | 044      |          | 24,5      | 6,6                              | 162   | 8,8                              | 215  | 13,2                             | 323  |
|          | 051      |          | 18,6      | 7,7                              | 143   | 10,2                             | 190  | 15,3                             | 285  |
|          | 064      |          | 15,7      | 9,6                              | 151   | 12,8                             | 201  | 19,2                             | 301  |
|          | 076      |          | 13,7      | 11,4                             | 156   | 15,2                             | 208  | 22,8                             | 312  |
|          | 089      |          | 10,8      | 13,4                             | 144   | 17,8                             | 192  | 26,7                             | 288  |
|          | 102      |          | 7,4       | 15,3                             | 113   | 20,4                             | 151  | 30,6                             | 226  |
|          | 305      |          | 3,1       | 45,8                             | 142   | 61,0                             | 189  | 91,5                             | 284  |
| 16       | 025      | 8,0      | 78,3      | 3,8                              | 294   | 5,0                              | 391  | 7,5                              | 587  |
|          | 032      |          | 59,8      | 4,8                              | 287   | 6,4                              | 383  | 9,6                              | 574  |
|          | 038      |          | 51,0      | 5,7                              | 291   | 7,6                              | 387  | 11,4                             | 581  |
|          | 044      |          | 43,1      | 6,6                              | 285   | 8,8                              | 379  | 13,2                             | 569  |
|          | 051      |          | 38,2      | 7,7                              | 292   | 10,2                             | 389  | 15,3                             | 584  |
|          | 064      |          | 31,4      | 9,6                              | 302   | 12,8                             | 402  | 19,2                             | 603  |
|          | 076      |          | 24,5      | 11,4                             | 280   | 15,2                             | 373  | 22,8                             | 559  |
|          | 089      |          | 20,6      | 13,4                             | 275   | 17,8                             | 367  | 26,7                             | 550  |
|          | 102      |          | 18,6      | 15,3                             | 285   | 20,4                             | 379  | 30,6                             | 569  |
|          | 115      |          | 15,7      | 17,3                             | 271   | 23,0                             | 361  | 34,5                             | 542  |
|          | 305      |          | 5,7       | 45,8                             | 261   | 61,0                             | 348  | 91,5                             | 522  |
|          | 20       |          | 025       | 10,0                             | 181,5 | 3,8                              | 681  | 5,0                              | 907  |
| 032      |          | 137,3    | 4,8       |                                  | 659   | 6,4                              | 879  | 9,6                              | 1318 |
| 038      |          | 107,9    | 5,7       |                                  | 615   | 7,6                              | 820  | 11,4                             | 1230 |
| 044      |          | 94,1     | 6,6       |                                  | 621   | 8,8                              | 828  | 13,2                             | 1242 |
| 051      |          | 78,5     | 7,7       |                                  | 601   | 10,2                             | 801  | 15,3                             | 1201 |
| 064      |          | 65,0     | 9,6       |                                  | 624   | 12,8                             | 832  | 19,2                             | 1248 |
| 076      |          | 56,9     | 11,4      |                                  | 649   | 15,2                             | 865  | 22,8                             | 1297 |
| 089      |          | 47,1     | 13,4      |                                  | 629   | 17,8                             | 839  | 26,7                             | 1258 |
| 102      |          | 41,2     | 15,3      |                                  | 631   | 20,4                             | 841  | 30,6                             | 1261 |
| 115      |          | 36,3     | 17,3      |                                  | 626   | 23,0                             | 835  | 34,5                             | 1252 |
| 127      |          | 32,4     | 19,1      |                                  | 617   | 25,4                             | 823  | 38,1                             | 1234 |
| 140      |          | 29,4     | 21,0      |                                  | 618   | 28,0                             | 823  | 42,0                             | 1235 |
| 152      |          | 25,5     | 22,8      |                                  | 582   | 30,4                             | 775  | 45,6                             | 1163 |
| 305      |          | 14,7     | 45,8      |                                  | 673   | 61,0                             | 897  | 91,5                             | 1345 |
| 25       | 025      | 12,5     | 333,5     | 3,8                              | 1251  | 5,0                              | 1667 | 7,5                              | 2501 |
|          | 032      |          | 257,4     | 4,8                              | 1236  | 6,4                              | 1647 | 9,6                              | 2471 |
|          | 038      |          | 210,8     | 5,7                              | 1202  | 7,6                              | 1602 | 11,4                             | 2403 |
|          | 044      |          | 176,5     | 6,6                              | 1165  | 8,8                              | 1553 | 13,2                             | 2330 |
|          | 051      |          | 148,1     | 7,7                              | 1133  | 10,2                             | 1511 | 15,3                             | 2266 |
|          | 064      |          | 119,6     | 9,6                              | 1148  | 12,8                             | 1531 | 19,2                             | 2296 |

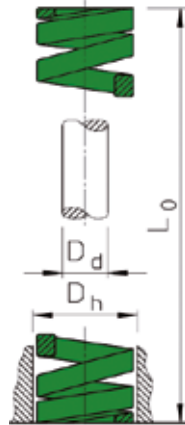




| Dh<br>mm | Lo<br>mm | Dd<br>mm | C<br>N/mm | 15% Arbeitsweg<br>Working stroke |       | 20% Arbeitsweg<br>Working stroke |      | 30% Arbeitsweg<br>Working stroke |      |
|----------|----------|----------|-----------|----------------------------------|-------|----------------------------------|------|----------------------------------|------|
|          |          |          |           | mm                               | N     | mm                               | N    | mm                               | N    |
| 25       | 076      | 12,5     | 100,0     | 11,4                             | 1140  | 15,2                             | 1520 | 22,8                             | 2280 |
|          | 089      |          | 83,4      | 13,4                             | 1114  | 17,8                             | 1485 | 26,7                             | 2227 |
|          | 102      |          | 73,6      | 15,3                             | 1126  | 20,4                             | 1501 | 30,6                             | 2252 |
|          | 115      |          | 63,7      | 17,3                             | 1099  | 23,0                             | 1465 | 34,5                             | 2198 |
|          | 127      |          | 56,9      | 19,1                             | 1084  | 25,4                             | 1445 | 38,1                             | 2168 |
|          | 140      |          | 51,0      | 21,0                             | 1071  | 28,0                             | 1428 | 42,0                             | 2142 |
|          | 152      |          | 47,1      | 22,8                             | 1074  | 30,4                             | 1432 | 45,6                             | 2148 |
|          | 178      |          | 41,2      | 26,7                             | 1100  | 35,6                             | 1467 | 53,4                             | 2200 |
|          | 203      |          | 36,3      | 30,5                             | 1106  | 40,6                             | 1474 | 60,9                             | 2211 |
|          | 305      |          | 22,6      | 45,8                             | 1034  | 61,0                             | 1379 | 91,5                             | 2068 |
| 32       | 038      | 16,0     | 362,9     | 5,7                              | 2069  | 7,6                              | 2758 | 11,4                             | 4137 |
|          | 044      |          | 307,9     | 6,6                              | 2032  | 8,8                              | 2709 | 13,2                             | 4064 |
|          | 051      |          | 262,8     | 7,7                              | 2011  | 10,2                             | 2681 | 15,3                             | 4021 |
|          | 064      |          | 205,9     | 9,6                              | 1977  | 12,8                             | 2635 | 19,2                             | 3953 |
|          | 076      |          | 171,6     | 11,4                             | 1956  | 15,2                             | 2608 | 22,8                             | 3912 |
|          | 089      |          | 147,1     | 13,4                             | 1964  | 17,8                             | 2619 | 26,7                             | 3928 |
|          | 102      |          | 127,5     | 15,3                             | 1951  | 20,4                             | 2601 | 30,6                             | 3902 |
|          | 115      |          | 112,8     | 17,3                             | 1946  | 23,0                             | 2595 | 34,5                             | 3892 |
|          | 127      |          | 101,0     | 19,1                             | 1924  | 25,4                             | 2565 | 38,1                             | 3848 |
|          | 140      |          | 88,3      | 21,0                             | 1855  | 28,0                             | 2473 | 42,0                             | 3709 |
|          | 152      |          | 80,9      | 22,8                             | 1845  | 30,4                             | 2459 | 45,6                             | 3689 |
|          | 178      |          | 68,6      | 26,7                             | 1832  | 35,6                             | 2442 | 53,4                             | 3663 |
|          | 203      |          | 59,8      | 30,5                             | 1821  | 40,6                             | 2428 | 60,9                             | 3642 |
|          | 254      |          | 46,9      | 38,1                             | 1787  | 50,8                             | 2383 | 76,2                             | 3574 |
|          | 305      |          | 39,2      | 45,8                             | 1794  | 61,0                             | 2391 | 91,5                             | 3587 |
|          | 40       |          | 051       | 20,0                             | 313,8 | 7,7                              | 2401 | 10,2                             | 3201 |
| 064      |          | 230,5    | 9,6       |                                  | 2213  | 12,8                             | 2951 | 19,2                             | 4426 |
| 076      |          | 196,1    | 11,4      |                                  | 2236  | 15,2                             | 2981 | 22,8                             | 4471 |
| 089      |          | 171,6    | 13,4      |                                  | 2291  | 17,8                             | 3055 | 26,7                             | 4582 |
| 102      |          | 142,2    | 15,3      |                                  | 2176  | 20,4                             | 2901 | 30,6                             | 4351 |
| 115      |          | 124,5    | 17,3      |                                  | 2148  | 23,0                             | 2863 | 34,5                             | 4295 |
| 127      |          | 112,8    | 19,1      |                                  | 2149  | 25,4                             | 2865 | 38,1                             | 4298 |
| 140      |          | 103,0    | 21,0      |                                  | 2163  | 28,0                             | 2884 | 42,0                             | 4326 |
| 152      |          | 93,2     | 22,8      |                                  | 2125  | 30,4                             | 2833 | 45,6                             | 4250 |
| 178      |          | 80,4     | 26,7      |                                  | 2147  | 35,6                             | 2862 | 53,4                             | 4293 |
| 203      |          | 70,6     | 30,5      |                                  | 2150  | 40,6                             | 2867 | 60,9                             | 4300 |
| 254      |          | 56,9     | 38,1      |                                  | 2168  | 50,8                             | 2891 | 76,2                             | 4336 |
| 305      |          | 47,1     | 45,8      |                                  | 2155  | 61,0                             | 2873 | 91,5                             | 4310 |
| 50       |          | 064      | 25,0      |                                  | 392,3 | 9,6                              | 3766 | 12,8                             | 5021 |
|          | 076      | 328,5    |           | 11,4                             | 3745  | 15,2                             | 4993 | 22,8                             | 7490 |
|          | 089      | 274,6    |           | 13,4                             | 3666  | 17,8                             | 4888 | 26,7                             | 7332 |
|          | 102      | 235,4    |           | 15,3                             | 3602  | 20,4                             | 4802 | 30,6                             | 7203 |
|          | 115      | 205,9    |           | 17,3                             | 3552  | 23,0                             | 4736 | 34,5                             | 7104 |
|          | 127      | 186,3    |           | 19,1                             | 3549  | 25,4                             | 4732 | 38,1                             | 7098 |
|          | 140      | 166,7    |           | 21,0                             | 3501  | 28,0                             | 4667 | 42,0                             | 7001 |
|          | 152      | 147,1    |           | 22,8                             | 3354  | 30,4                             | 4472 | 45,6                             | 6708 |
|          | 178      | 127,5    |           | 26,7                             | 3405  | 35,6                             | 4539 | 53,4                             | 6809 |
|          | 203      | 112,8    |           | 30,5                             | 3435  | 40,6                             | 4580 | 60,9                             | 6870 |
|          | 254      | 88,3     |           | 38,1                             | 3364  | 50,8                             | 4485 | 76,2                             | 6728 |
|          | 305      | 70,6     |           | 45,8                             | 3230  | 61,0                             | 4307 | 91,5                             | 6460 |

**FE 838 BB**

 FE 838 BB / 10 x 025



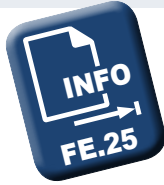
| Dh<br>mm | Lo<br>mm | Dd<br>mm | C<br>N/mm | 15% Arbeitsweg<br>Working stroke |       | 20% Arbeitsweg<br>Working stroke |      | 25% Arbeitsweg<br>Working stroke |      |
|----------|----------|----------|-----------|----------------------------------|-------|----------------------------------|------|----------------------------------|------|
|          |          |          |           | mm                               | N     | mm                               | N    | mm                               | N    |
| 10       | 025      | 5,0      | 38,9      | 3,8                              | 146   | 5,0                              | 194  | 6,3                              | 243  |
|          | 032      |          | 29,8      | 4,8                              | 143   | 6,4                              | 190  | 8,0                              | 238  |
|          | 038      |          | 25,4      | 5,7                              | 145   | 7,6                              | 193  | 9,5                              | 241  |
|          | 044      |          | 20,2      | 6,6                              | 133   | 8,8                              | 178  | 11,0                             | 222  |
|          | 051      |          | 17,6      | 7,7                              | 135   | 10,2                             | 180  | 12,8                             | 225  |
|          | 064      |          | 14,0      | 9,6                              | 134   | 12,8                             | 179  | 16,0                             | 224  |
|          | 076      |          | 11,4      | 11,4                             | 130   | 15,2                             | 174  | 19,0                             | 217  |
|          | 305      |          | 2,6       | 45,8                             | 119   | 61,0                             | 158  | 76,3                             | 198  |
| 13       | 025      | 6,3      | 56,5      | 3,8                              | 212   | 5,0                              | 282  | 6,3                              | 353  |
|          | 032      |          | 42,1      | 4,8                              | 202   | 6,4                              | 270  | 8,0                              | 337  |
|          | 038      |          | 35,1      | 5,7                              | 200   | 7,6                              | 266  | 9,5                              | 333  |
|          | 044      |          | 29,8      | 6,6                              | 197   | 8,8                              | 262  | 11,0                             | 328  |
|          | 051      |          | 24,6      | 7,7                              | 188   | 10,2                             | 251  | 12,8                             | 314  |
|          | 064      |          | 20,2      | 9,6                              | 194   | 12,8                             | 258  | 16,0                             | 323  |
|          | 076      |          | 15,8      | 11,4                             | 180   | 15,2                             | 240  | 19,0                             | 300  |
|          | 089      |          | 14,0      | 13,4                             | 187   | 17,8                             | 250  | 22,3                             | 312  |
|          | 102      |          | 10,8      | 15,3                             | 165   | 20,4                             | 220  | 25,5                             | 275  |
|          | 305      |          | 4,4       | 45,8                             | 202   | 61,0                             | 269  | 76,3                             | 336  |
| 16       | 025      | 8,0      | 111,2     | 3,8                              | 417   | 5,0                              | 556  | 6,3                              | 695  |
|          | 032      |          | 82,3      | 4,8                              | 395   | 6,4                              | 526  | 8,0                              | 658  |
|          | 038      |          | 66,7      | 5,7                              | 380   | 7,6                              | 507  | 9,5                              | 634  |
|          | 044      |          | 56,1      | 6,6                              | 370   | 8,8                              | 494  | 11,0                             | 617  |
|          | 051      |          | 51,0      | 7,7                              | 390   | 10,2                             | 520  | 12,8                             | 650  |
|          | 064      |          | 38,5      | 9,6                              | 370   | 12,8                             | 493  | 16,0                             | 616  |
|          | 076      |          | 31,5      | 11,4                             | 359   | 15,2                             | 479  | 19,0                             | 599  |
|          | 089      |          | 28,0      | 13,4                             | 374   | 17,8                             | 499  | 22,3                             | 624  |
|          | 102      |          | 23,6      | 15,3                             | 361   | 20,4                             | 482  | 25,5                             | 602  |
|          | 115      |          | 20,6      | 17,3                             | 356   | 23,0                             | 474  | 28,8                             | 593  |
|          | 305      |          | 7,8       | 45,8                             | 357   | 61,0                             | 476  | 76,3                             | 595  |
|          | 20       |          | 025       | 10,0                             | 207,5 | 3,8                              | 778  | 5,0                              | 1038 |
| 032      |          | 166,8    | 4,8       |                                  | 800   | 6,4                              | 1067 | 8,0                              | 1334 |
| 038      |          | 132,4    | 5,7       |                                  | 755   | 7,6                              | 1006 | 9,5                              | 1258 |
| 044      |          | 117,7    | 6,6       |                                  | 777   | 8,8                              | 1036 | 11,0                             | 1295 |
| 051      |          | 98,5     | 7,7       |                                  | 754   | 10,2                             | 1005 | 12,8                             | 1256 |
| 064      |          | 83,4     | 9,6       |                                  | 800   | 12,8                             | 1067 | 16,0                             | 1334 |
| 076      |          | 68,6     | 11,4      |                                  | 782   | 15,2                             | 1042 | 19,0                             | 1303 |
| 089      |          | 55,0     | 13,4      |                                  | 734   | 17,8                             | 979  | 22,3                             | 1224 |
| 102      |          | 48,1     | 15,3      |                                  | 736   | 20,4                             | 982  | 25,5                             | 1227 |
| 115      |          | 41,3     | 17,3      |                                  | 712   | 23,0                             | 950  | 28,8                             | 1187 |
| 127      |          | 38,3     | 19,1      |                                  | 729   | 25,4                             | 972  | 31,8                             | 1215 |
| 140      |          | 33,3     | 21,0      |                                  | 700   | 28,0                             | 933  | 35,0                             | 1166 |
| 152      |          | 31,4     | 22,8      |                                  | 716   | 30,4                             | 954  | 38,0                             | 1193 |
| 305      |          | 16,5     | 45,8      |                                  | 755   | 61,0                             | 1007 | 76,3                             | 1259 |
| 25       | 025      | 12,5     | 444,8     | 3,8                              | 1668  | 5,0                              | 2224 | 6,3                              | 2780 |
|          | 032      |          | 343,3     | 4,8                              | 1648  | 6,4                              | 2197 | 8,0                              | 2746 |
|          | 038      |          | 323,6     | 5,7                              | 1844  | 7,6                              | 2459 | 9,5                              | 3074 |
|          | 044      |          | 264,8     | 6,6                              | 1748  | 8,8                              | 2330 | 11,0                             | 2913 |
|          | 051      |          | 201,8     | 7,7                              | 1544  | 10,2                             | 2058 | 12,8                             | 2573 |
|          | 064      |          | 156,9     | 9,6                              | 1506  | 12,8                             | 2008 | 16,0                             | 2510 |

[FE]



| Dh<br>mm | L0<br>mm | Dd<br>mm | C<br>N/mm | 15% Arbeitsweg<br>Working stroke |       | 20% Arbeitsweg<br>Working stroke |      | 25% Arbeitsweg<br>Working stroke |       |
|----------|----------|----------|-----------|----------------------------------|-------|----------------------------------|------|----------------------------------|-------|
|          |          |          |           | mm                               | N     | mm                               | N    | mm                               | N     |
| 25       | 076      | 12,5     | 127,5     | 11,4                             | 1454  | 15,2                             | 1938 | 19,0                             | 2423  |
|          | 089      |          | 108,1     | 13,4                             | 1444  | 17,8                             | 1925 | 22,3                             | 2406  |
|          | 102      |          | 96,1      | 15,3                             | 1471  | 20,4                             | 1961 | 25,5                             | 2451  |
|          | 115      |          | 84,5      | 17,3                             | 1457  | 23,0                             | 1942 | 28,8                             | 2428  |
|          | 127      |          | 75,6      | 19,1                             | 1441  | 25,4                             | 1921 | 31,8                             | 2401  |
|          | 140      |          | 63,7      | 21,0                             | 1338  | 28,0                             | 1784 | 35,0                             | 2230  |
|          | 152      |          | 62,8      | 22,8                             | 1432  | 30,4                             | 1909 | 38,0                             | 2386  |
|          | 178      |          | 53,9      | 26,7                             | 1439  | 35,6                             | 1919 | 44,5                             | 2399  |
|          | 203      |          | 46,1      | 30,5                             | 1405  | 40,6                             | 1874 | 50,8                             | 2342  |
|          | 305      |          | 33,3      | 45,8                             | 1525  | 61,0                             | 2033 | 76,3                             | 2541  |
| 32       | 038      | 16,0     | 470,7     | 5,7                              | 2683  | 7,6                              | 3578 | 9,5                              | 4472  |
|          | 044      |          | 392,3     | 6,6                              | 2589  | 8,8                              | 3452 | 11,0                             | 4315  |
|          | 051      |          | 334,7     | 7,7                              | 2561  | 10,2                             | 3414 | 12,8                             | 4268  |
|          | 064      |          | 264,8     | 9,6                              | 2542  | 12,8                             | 3390 | 16,0                             | 4237  |
|          | 076      |          | 215,6     | 11,4                             | 2458  | 15,2                             | 3277 | 19,0                             | 4096  |
|          | 089      |          | 167,1     | 13,4                             | 2230  | 17,8                             | 2974 | 22,3                             | 3717  |
|          | 102      |          | 147,1     | 15,3                             | 2251  | 20,4                             | 3001 | 25,5                             | 3751  |
|          | 115      |          | 137,5     | 17,3                             | 2372  | 23,0                             | 3163 | 28,8                             | 3954  |
|          | 127      |          | 127,7     | 19,1                             | 2433  | 25,4                             | 3244 | 31,8                             | 4055  |
|          | 140      |          | 112,8     | 21,0                             | 2369  | 28,0                             | 3158 | 35,0                             | 3948  |
|          | 152      |          | 103,0     | 22,8                             | 2348  | 30,4                             | 3131 | 38,0                             | 3914  |
|          | 178      |          | 92,2      | 26,7                             | 2462  | 35,6                             | 3282 | 44,5                             | 4103  |
|          | 203      |          | 75,6      | 30,5                             | 2301  | 40,6                             | 3068 | 50,8                             | 3835  |
|          | 254      |          | 60,8      | 38,1                             | 2317  | 50,8                             | 3089 | 63,5                             | 3861  |
|          | 305      |          | 49,0      | 45,8                             | 2243  | 61,0                             | 2991 | 76,3                             | 3739  |
|          | 40       |          | 051       | 20,0                             | 541,5 | 7,7                              | 4142 | 10,2                             | 5523  |
| 064      |          | 460,9    | 9,6       |                                  | 4424  | 12,8                             | 5899 | 16,0                             | 7374  |
| 076      |          | 353,0    | 11,4      |                                  | 4024  | 15,2                             | 5366 | 19,0                             | 6707  |
| 089      |          | 294,9    | 13,4      |                                  | 3937  | 17,8                             | 5249 | 22,3                             | 6561  |
| 102      |          | 255,0    | 15,3      |                                  | 3902  | 20,4                             | 5202 | 25,5                             | 6503  |
| 115      |          | 226,0    | 17,3      |                                  | 3898  | 23,0                             | 5198 | 28,8                             | 6497  |
| 127      |          | 201,3    | 19,1      |                                  | 3835  | 25,4                             | 5114 | 31,8                             | 6392  |
| 140      |          | 186,3    | 21,0      |                                  | 3913  | 28,0                             | 5217 | 35,0                             | 6521  |
| 152      |          | 166,7    | 22,8      |                                  | 3801  | 30,4                             | 5068 | 38,0                             | 6335  |
| 178      |          | 147,1    | 26,7      |                                  | 3928  | 35,6                             | 5237 | 44,5                             | 6546  |
| 203      |          | 127,6    | 30,5      |                                  | 3886  | 40,6                             | 5182 | 50,8                             | 6477  |
| 254      |          | 98,1     | 38,1      |                                  | 3737  | 50,8                             | 4983 | 63,5                             | 6229  |
| 305      |          | 83,4     | 45,8      |                                  | 3818  | 61,0                             | 5090 | 76,3                             | 6363  |
| 50       |          | 064      | 25,0      |                                  | 645,3 | 9,6                              | 6195 | 12,8                             | 8260  |
|          | 076      | 554,1    |           | 11,4                             | 6317  | 15,2                             | 8422 | 19,0                             | 10528 |
|          | 089      | 452,1    |           | 13,4                             | 6036  | 17,8                             | 8048 | 22,3                             | 10060 |
|          | 102      | 402,1    |           | 15,3                             | 6152  | 20,4                             | 8203 | 25,5                             | 10254 |
|          | 115      | 343,8    |           | 17,3                             | 5930  | 23,0                             | 7907 | 28,8                             | 9884  |
|          | 127      | 314,3    |           | 19,1                             | 5987  | 25,4                             | 7983 | 31,8                             | 9979  |
|          | 140      | 284,4    |           | 21,0                             | 5972  | 28,0                             | 7963 | 35,0                             | 9954  |
|          | 152      | 264,8    |           | 22,8                             | 6037  | 30,4                             | 8050 | 38,0                             | 10062 |
|          | 178      | 225,6    |           | 26,7                             | 6023  | 35,6                             | 8031 | 44,5                             | 10039 |
|          | 203      | 193,9    |           | 30,5                             | 5904  | 40,6                             | 7872 | 50,8                             | 9840  |
|          | 254      | 153,0    |           | 38,1                             | 5830  | 50,8                             | 7773 | 63,5                             | 9716  |
|          | 305      | 146,2    |           | 45,8                             | 6688  | 61,0                             | 8918 | 76,3                             | 11147 |

**FE 802**



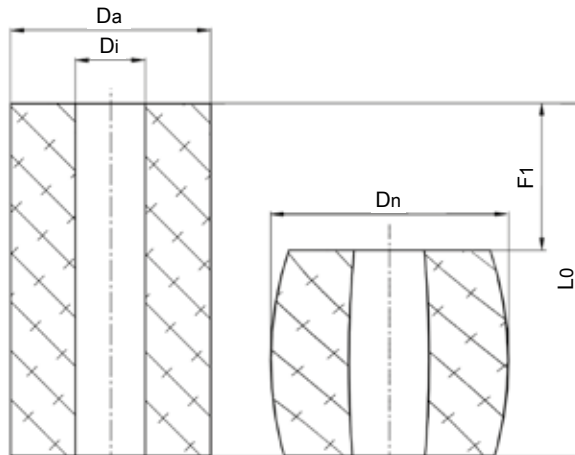
Mat.: Elastomere / Ultraflex 92  
Härte: 92 ±5 Shore

Elastomer-Federn haben eine Setz-  
neigung, die abhängig vom Wärme,  
Federweg und Hubgeschwindigkeit  
ist. Sie beträgt ca. 5-8% der Feder-  
länge L<sub>0</sub>.

Mat.: Elastomer / Ultraflex 92  
Hardness: 92 ±5 Shore

Elastomer springs do have a settling  
characteristic of around 5-8 % of  
the initial total length L<sub>0</sub>, depending  
on temperature, stroke length and  
speed.

**FE 802 / 040 x 32**

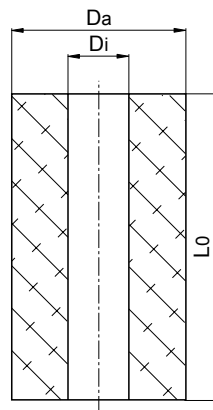


| Da  | L <sub>0</sub> | Di   | D <sub>n</sub> | F <sub>max.</sub><br>mm |
|-----|----------------|------|----------------|-------------------------|
| 016 | 16             | 6,5  | 21             | 4,8                     |
|     | 20             | 6,5  | 21             | 6,0                     |
|     | 25             | 6,5  | 21             | 7,5                     |
|     | 32             | 6,5  | 21             | 9,6                     |
| 020 | 16             | 8,5  | 26             | 4,8                     |
|     | 20             | 8,5  | 26             | 6,0                     |
|     | 25             | 8,5  | 26             | 7,5                     |
|     | 32             | 8,5  | 26             | 9,6                     |
| 025 | 16             | 10,5 | 33             | 4,8                     |
|     | 20             | 10,5 | 33             | 6,0                     |
|     | 25             | 10,5 | 33             | 7,5                     |
|     | 32             | 10,5 | 33             | 9,6                     |
| 032 | 16             | 13,5 | 42             | 4,8                     |
|     | 20             | 13,5 | 42             | 6,0                     |
|     | 25             | 13,5 | 42             | 7,5                     |
|     | 32             | 13,5 | 42             | 9,6                     |
| 040 | 16             | 13,5 | 52             | 4,8                     |
|     | 20             | 13,5 | 52             | 6,0                     |
|     | 25             | 13,5 | 52             | 7,5                     |
|     | 32             | 13,5 | 52             | 9,6                     |
| 040 | 40             | 13,5 | 52             | 12,0                    |
|     | 50             | 13,5 | 52             | 15,0                    |
|     | 63             | 13,5 | 52             | 18,9                    |
|     | 80             | 13,5 | 52             | 24,0                    |

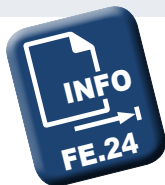
| Da  | L <sub>0</sub> | Di   | D <sub>n</sub> | F <sub>max.</sub><br>mm |
|-----|----------------|------|----------------|-------------------------|
| 050 | 25             | 17,0 | 65             | 7,5                     |
|     | 32             | 17,0 | 65             | 9,6                     |
|     | 40             | 17,0 | 65             | 12,0                    |
|     | 50             | 17,0 | 65             | 15,0                    |
|     | 63             | 17,0 | 65             | 18,9                    |
| 063 | 80             | 17,0 | 65             | 24,0                    |
|     | 100            | 17,0 | 65             | 30,0                    |
|     | 32             | 17,0 | 82             | 9,6                     |
|     | 40             | 17,0 | 82             | 12,0                    |
| 080 | 50             | 17,0 | 82             | 15,0                    |
|     | 63             | 17,0 | 82             | 18,9                    |
|     | 80             | 17,0 | 82             | 24,0                    |
|     | 100            | 17,0 | 82             | 30,0                    |
| 100 | 32             | 21,0 | 104            | 9,6                     |
|     | 40             | 21,0 | 104            | 12,0                    |
|     | 50             | 21,0 | 104            | 15,0                    |
|     | 63             | 21,0 | 104            | 18,9                    |
| 125 | 80             | 21,0 | 104            | 24,0                    |
|     | 100            | 21,0 | 104            | 30,0                    |
|     | 50             | 21,0 | 130            | 15,0                    |
|     | 63             | 21,0 | 130            | 18,9                    |
| 125 | 80             | 21,0 | 130            | 24,0                    |
|     | 100            | 21,0 | 130            | 30,0                    |
|     | 50             | 27,0 | 160            | 15,0                    |
|     | 63             | 27,0 | 160            | 18,9                    |
| 125 | 80             | 27,0 | 160            | 24,0                    |
|     | 100            | 27,0 | 160            | 30,0                    |
|     |                |      |                |                         |
|     |                |      |                |                         |

[FE]





### FE 804



Mat.: Elastomere / Ultraflex  
Härte: 82 Shore

Mat.: Elastomer / Ultraflex  
Hardness: 82 Shore

FE 804 / 016

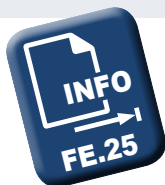
Kennfarbe gelb

Color code yellow

| Da  | Di | L0  |
|-----|----|-----|
| 016 | 7  | 250 |
| 020 | 9  | 250 |
| 025 | 11 | 250 |
| 032 | 14 | 500 |
| 040 | 14 | 500 |
| 050 | 17 | 500 |
| 063 | 17 | 500 |
| 080 | 21 | 500 |
| 100 | 21 | 500 |
| 125 | 27 | 500 |



### FE 805



Mat.: Elastomere / Ultraflex  
Härte: 92 Shore

Mat.: Elastomer / Ultraflex  
Hardness: 92 Shore

FE 805 / 025

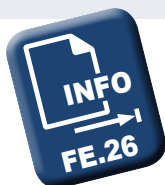
Kennfarbe rot

Color code red

| Da  | Di | L0  |
|-----|----|-----|
| 016 | 7  | 250 |
| 020 | 9  | 250 |
| 025 | 11 | 250 |
| 032 | 14 | 500 |
| 040 | 14 | 500 |
| 050 | 17 | 500 |
| 063 | 17 | 500 |
| 080 | 21 | 500 |
| 100 | 21 | 500 |
| 125 | 27 | 500 |



### FE 806



Mat.: Elastomere / Ultraflex  
Härte: 94 Shore

Mat.: Elastomer / Ultraflex  
Hardness: 94 Shore

FE 806 / 040

Kennfarbe grün

Color code green

| Da  | Di | L0  |
|-----|----|-----|
| 016 | 7  | 250 |
| 020 | 9  | 250 |
| 025 | 11 | 250 |
| 032 | 14 | 500 |
| 040 | 14 | 500 |
| 050 | 17 | 500 |
| 063 | 17 | 500 |
| 080 | 21 | 500 |
| 100 | 21 | 500 |
| 125 | 27 | 500 |

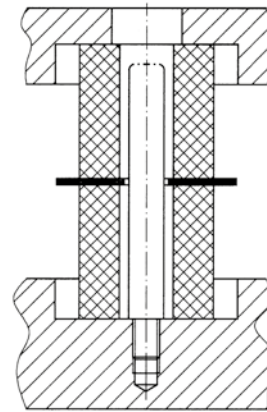
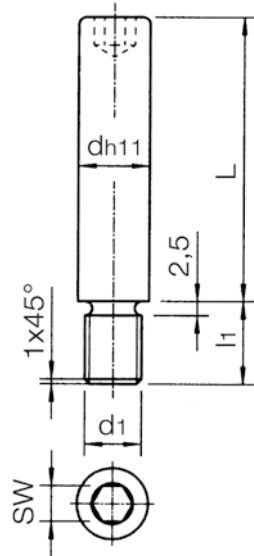


FE 816

Mat.: C15

Mat.: C15

FE 816 / 06 x 020



| d   | d1  | l1   | SW   | L +0,1 |     |     |     |     |     |     |     |     |     |     |
|-----|-----|------|------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| h11 |     | -0,1 | ±0,2 | 020    | 025 | 032 | 040 | 050 | 063 | 080 | 095 | 118 | 140 | 180 |
| 06  | M4  | 6    | 3    | •      | •   | •   |     |     |     |     |     |     |     |     |
| 08  | M6  | 9    | 4    | •      | •   | •   | •   | •   |     |     |     |     |     |     |
| 10  | M8  | 15   | 5    | •      | •   | •   | •   | •   | •   |     |     |     |     |     |
| 13  | M10 | 15   | 6    |        |     | •   | •   | •   | •   | •   |     |     |     |     |
| 16  | M12 | 18   | 8    |        |     | •   | •   | •   | •   | •   | •   | •   | •   |     |
| 20  | M16 | 25   | 10   |        |     | •   | •   | •   | •   | •   | •   | •   | •   | •   |
| 25  | M20 | 30   | 14   |        |     | •   | •   | •   | •   | •   | •   | •   | •   | •   |

Federteller nach DIN ISO 10069-2 für Elastomerfedern

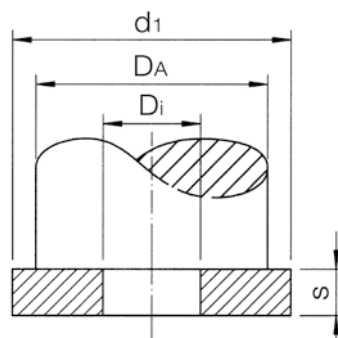
Spring washers, DIN ISO 10069-2 for elastomer - springs

FE 815

Mat.: MS 58

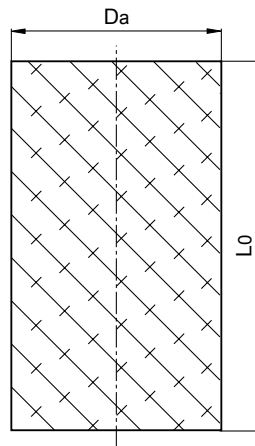
Mat.: MS 58

FE 815 / 016



| DA  | d1  | Di   | s |
|-----|-----|------|---|
| 016 | 20  | 6,5  | 4 |
| 020 | 25  | 8,5  | 4 |
| 025 | 30  | 10,5 | 5 |
| 032 | 40  | 13,5 | 5 |
| 040 | 50  | 13,5 | 5 |
| 050 | 60  | 16,5 | 6 |
| 063 | 80  | 16,5 | 6 |
| 080 | 100 | 20,5 | 8 |
| 100 | 120 | 20,5 | 8 |
| 125 | 150 | 26,0 | 8 |





**FE 807**



Mat.: Elastomere / Ultraflex  
Härte: 82 Shore

Mat.: Elastomer / Ultraflex  
Hardness: 82 Shore

**FE 807 / 016**

**Kennfarbe gelb**

**Color code yellow**

| Da  | Lo  |
|-----|-----|
| 016 | 250 |
| 020 | 250 |
| 025 | 250 |
| 032 | 500 |
| 040 | 500 |
| 050 | 500 |
| 063 | 500 |
| 080 | 500 |
| 100 | 500 |
| 125 | 500 |



**FE 808**



Mat.: Elastomere / Ultraflex  
Härte: 92 Shore

Mat.: Elastomer / Ultraflex  
Hardness: 92 Shore

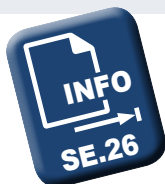
**FE 808 / 025**

**Color code red**

| Da  | Lo  |
|-----|-----|
| 016 | 250 |
| 020 | 250 |
| 025 | 250 |
| 032 | 500 |
| 040 | 500 |
| 050 | 500 |
| 063 | 500 |
| 080 | 500 |
| 100 | 500 |
| 125 | 500 |



**FE 809**



Mat.: Elastomere / Ultraflex  
Härte: 94 Shore

Mat.: Elastomer / Ultraflex  
Hardness: 94 Shore

**FE 809 / 040**

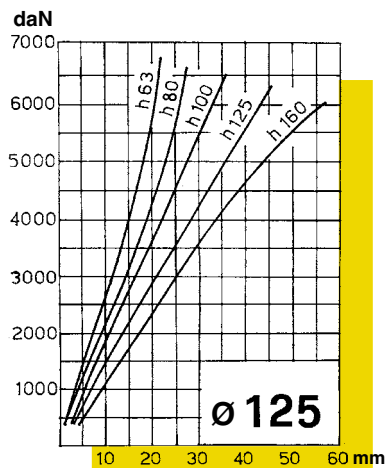
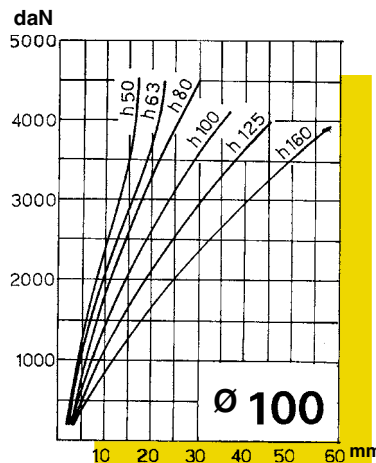
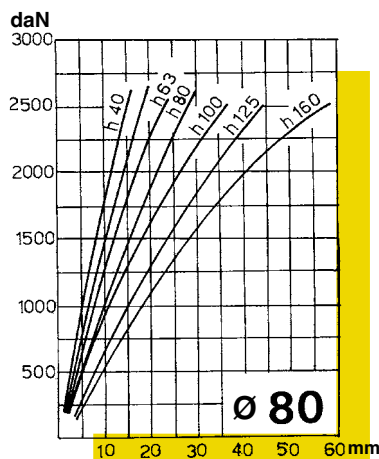
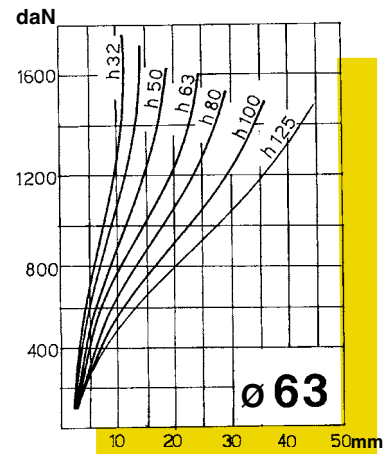
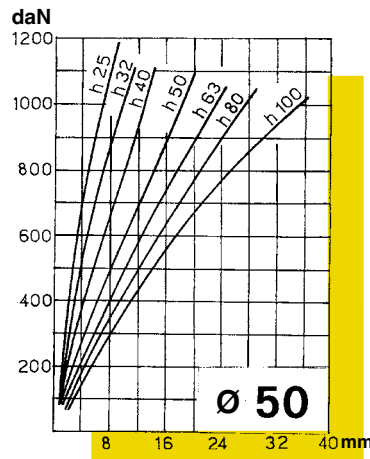
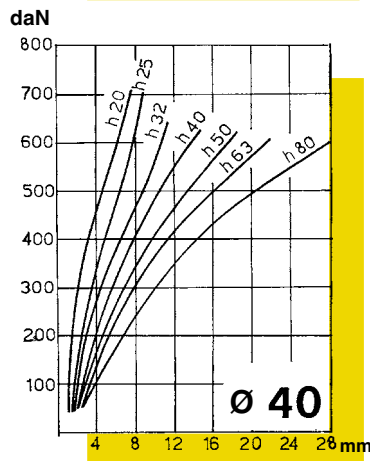
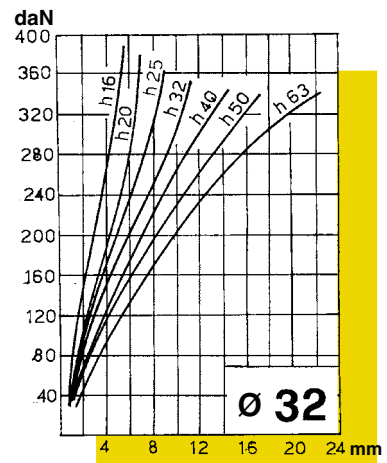
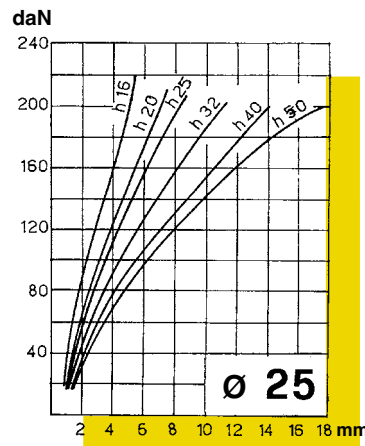
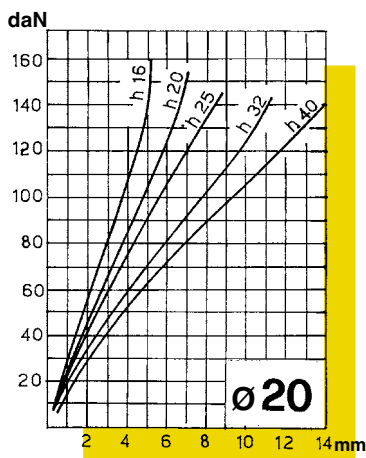
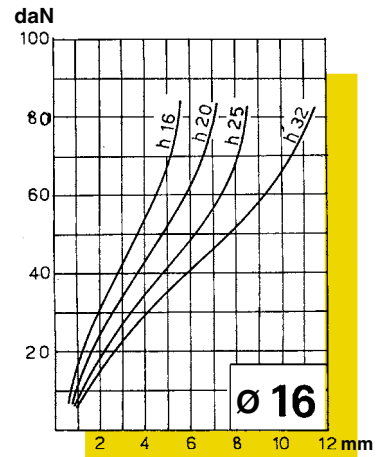
**Kennfarbe grün**

**Color code green**

| Da  | Lo  |
|-----|-----|
| 016 | 250 |
| 020 | 250 |
| 025 | 250 |
| 032 | 500 |
| 040 | 500 |
| 050 | 500 |
| 063 | 500 |
| 080 | 500 |
| 100 | 500 |
| 125 | 500 |



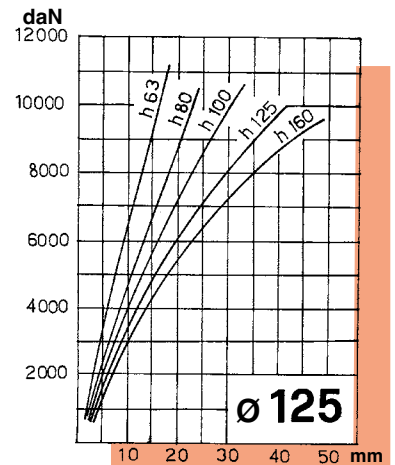
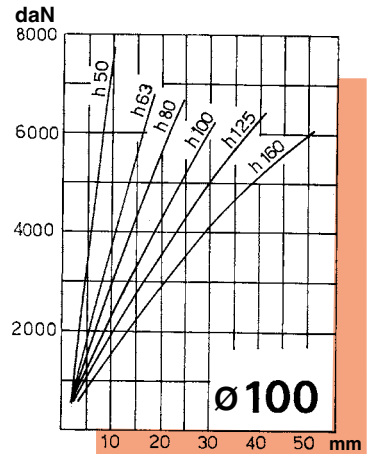
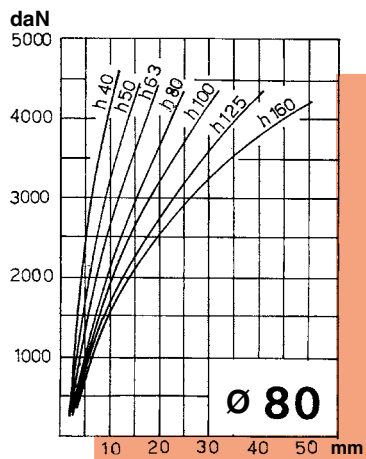
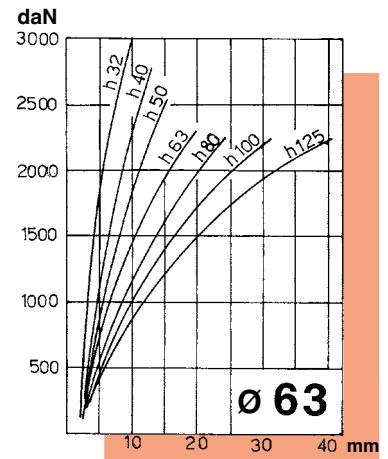
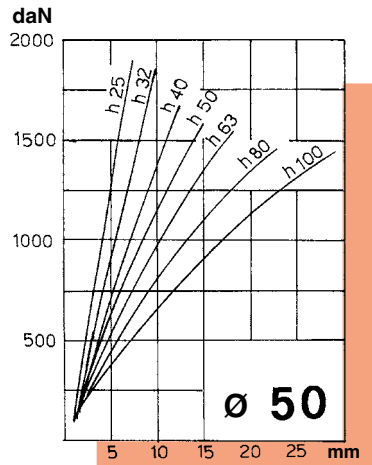
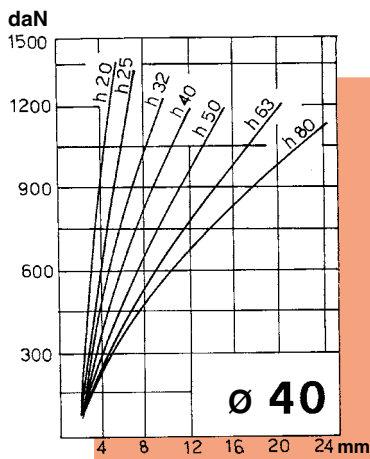
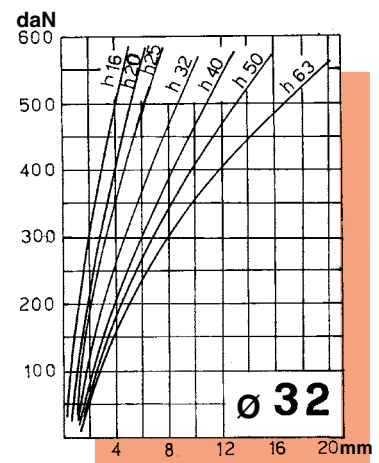
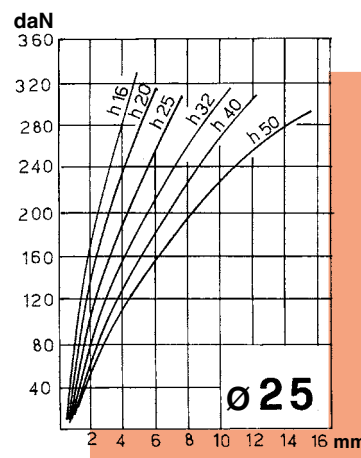
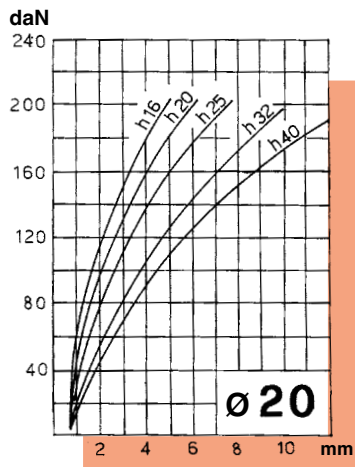
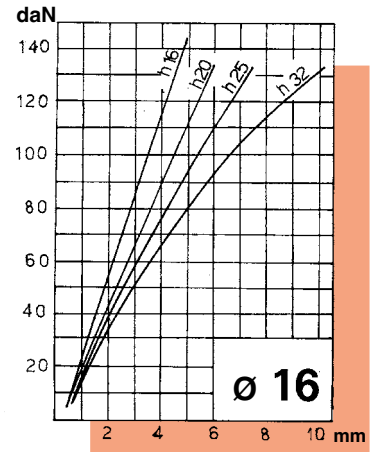
[FE]

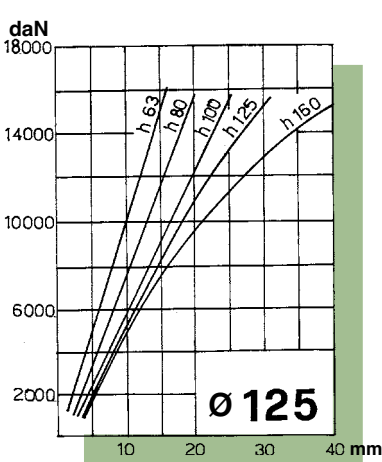
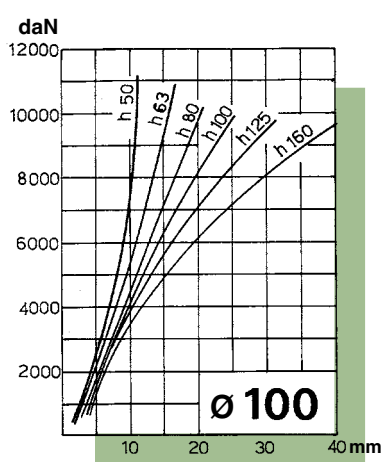
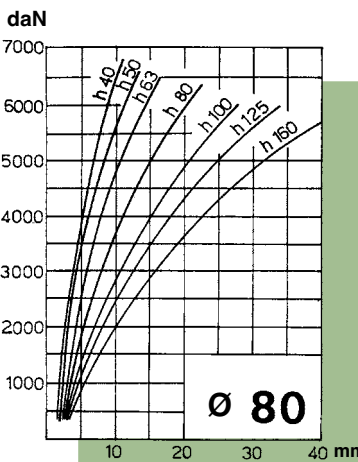
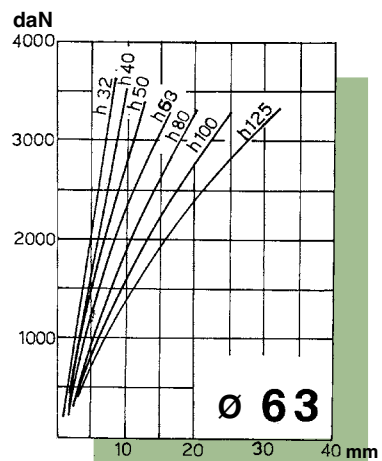
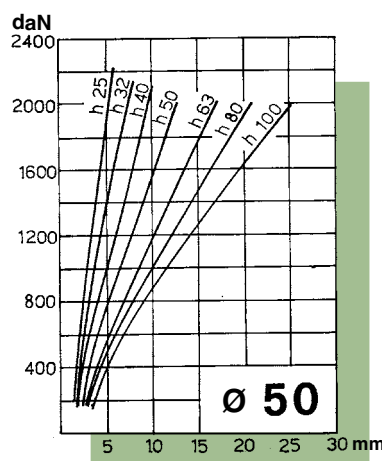
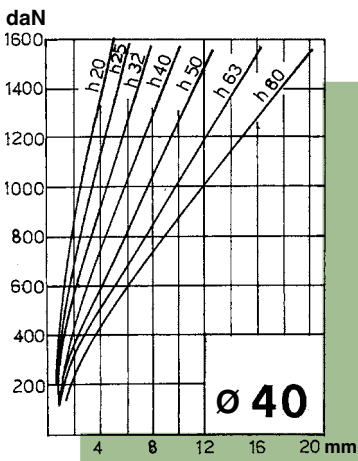
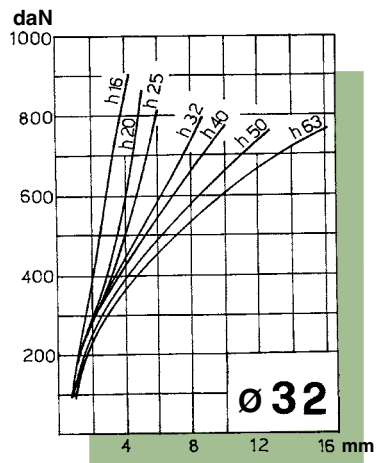
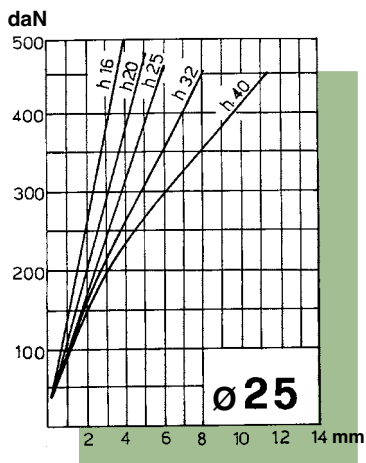
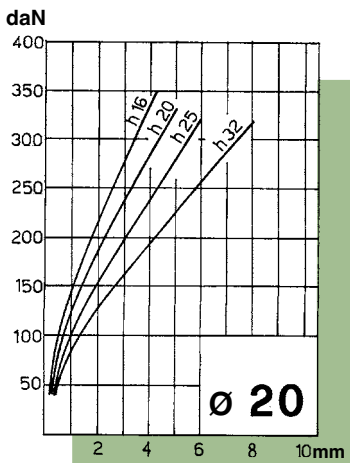
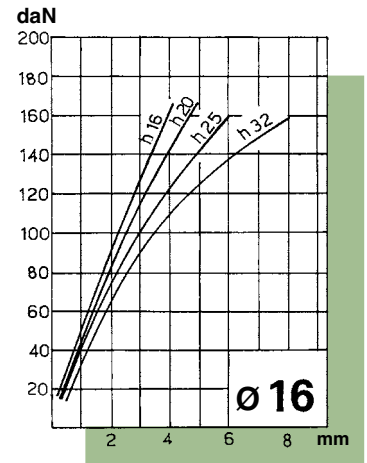


[FE]









[FE]





