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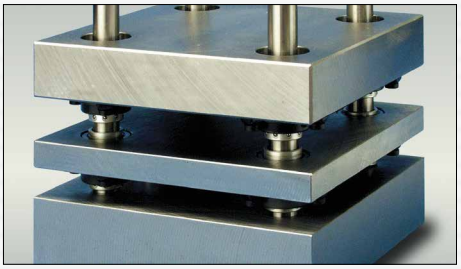

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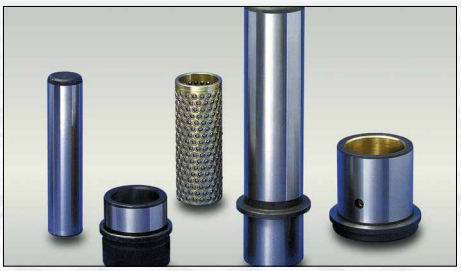

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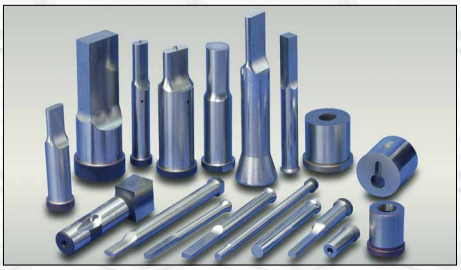

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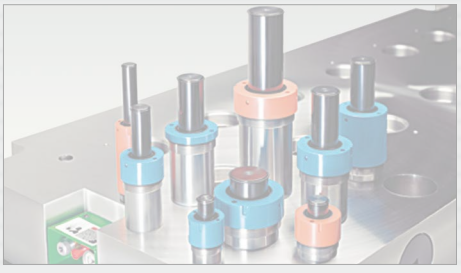

[hyson StickstoffSysteme]
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Punches with oblong shape over the total length	SE 740, SE 741	SE.29
Punches with oblong shape over the total length with countersunk head	SE 744, SE 745	SE.26
Punches with rectangular shape over the total length	SE 738, SE 739	SE.28
Punches with rectangular shape over the total length with countersunk head	SE 748, SE 749	SE.27
Punches, cylindrical head, Type K	SE 712	SE.6
Punches, cylindrical head, Type K ISO 8020	SE 712 ISO	SE.7
Punches, shouldered shank, Type KP	SE 716 KP	SE.8
Punches, shouldered shank, Types KF, KO, KR, KS	SE 731 . .	SE.10

Artikel Article	Best.-Nr. Order no.	Seite Page
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Quick change leader pins with collar	FS 419	FS.9
Quick change leader pins with collar, M-Line	FS 319	FS.2
Rust remover	TH 011	TH.75
S		
Screw locking	TH 016	TH.80
Shanks with screwed shaft, similar DIN 9859, Form CE	TH 380	TH.22
Solid bars	FE 807, FE 808, FE 809	FE.23
Spacer tubes, ground	FE 829	FE.3
Spacers, ground	FE 830	FE.2
Special punches, Shape examples		SE.41
Spray grease	TH 013	TH.77
Spring plungers with ball and with slot, Type K	TH 310	TH.11
Spring plungers with ball and with slot, Type KN	TH 320	TH.12
Spring plungers with round ended bolt and hexagon socket, Type A	TH 340	TH.14
Spring plungers with round ended bolt and slot, Type B	TH 330	TH.13
Spring plungers, long version, Type L	TH 350	TH.15
Spring washerss, DIN ISO 10069-2 for elastomer-springs	FE 815	FE.22
Standard numbering heads	TH 936	TH.73
Steel die sets, 2 plates, 2 leader pins, types A-C-D	SG 2 .	SG.5 - 8
Steel die sets, 2 plates, 2 leader pins, types A-C-D, M-Line	SG 2 . RM	SG.26 - 29
Steel die sets, 2 plates, 4 leader pins, type Q	SG 2 Q	SG.13 - 16
Steel die sets, 2 plates, 4 leader pins, type Q, M-Line	SG 2 Q RM	SG.34 - 37
Steel die sets, 3 plates, 2 leader pins, types A-C-D	SG 3 .	SG.9 - 12
Steel die sets, 3 plates, 2 leader pins, types A-C-D, M-Line	SG 3 . RM	SG.30 - 33
Steel die sets, 3 plates, 4 leader pins, type Q	SG 3 Q	SG.17 - 20
Steel die sets, 3 plates, 4 leader pins, type Q, M-Line	SG 3 Q RM	SG.38 - 41
Support blocks, teflon	NCVA.4	TH.59
Supports	NCVA....	TH.58
T / U		
Tapered interlocks with spacer disk	TH 920, TH 921	TH.38, TH.39
Universal lifting points with eye hook, double ball bearing	TH 53 R	TH.33
V / W		
Wear plates VDI 3357 with self lubricating graphite plugs, 12 mm thick	FS 502	FS.27
Wear plates VDI 3357 with self lubricating graphite plugs, 20 mm thick	FS 500	FS.26
X / Y / Z		
XXL - steel plates and welded units with additional work / secondary operation		SG.43 - 46

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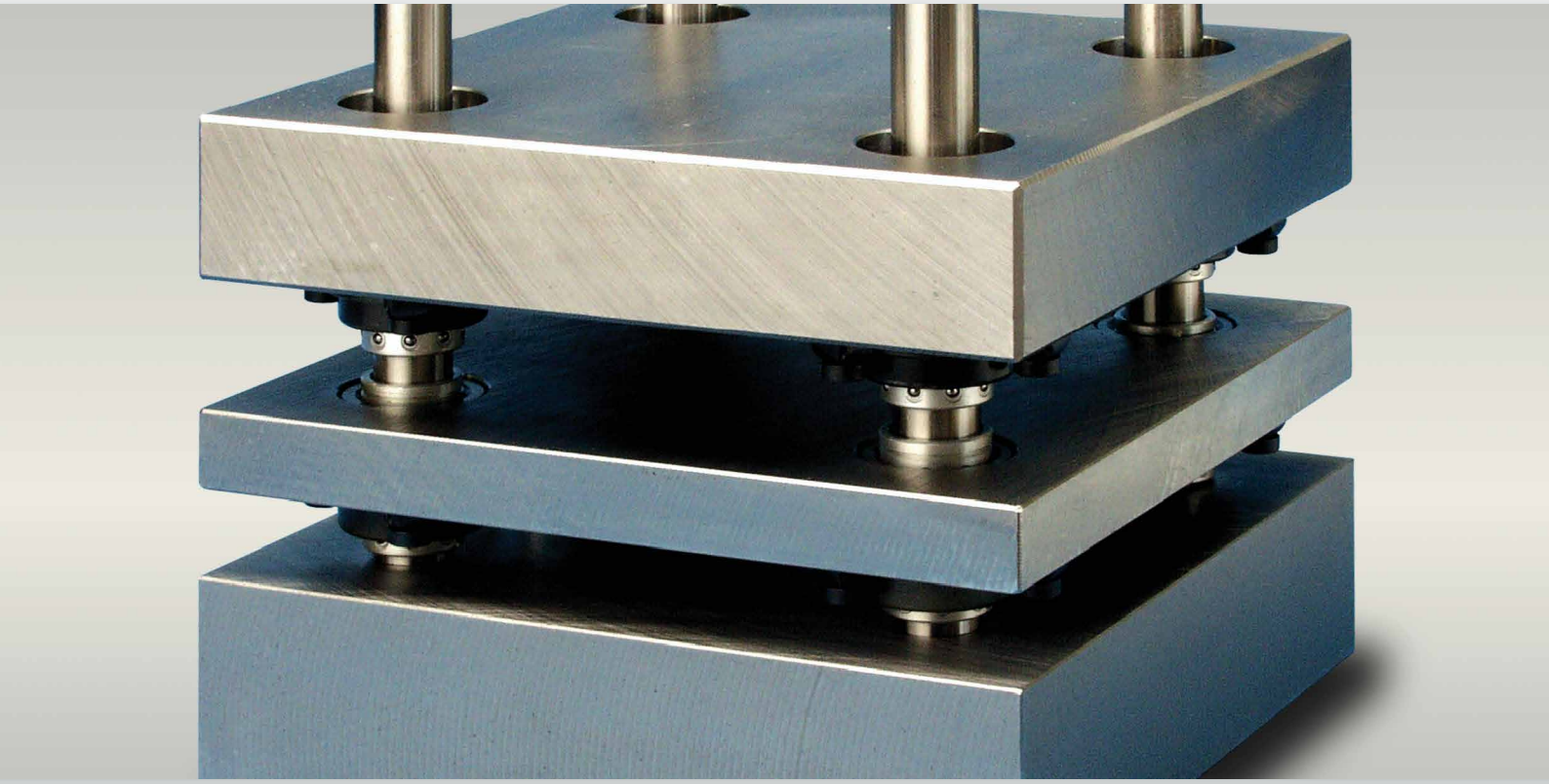
MSPN GMBH

Märkische Stanz-Partner



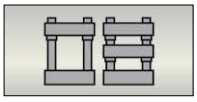
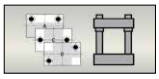
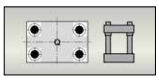
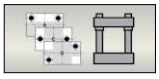
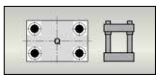
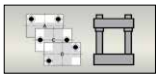
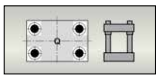
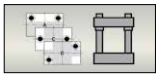
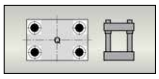
[säulengestelle]

[diesets]

Inhalt

Content

SÄULENGESTELLE / DIE SETS

	**Säulengestelle aus Stahl**	**Steel die sets**	**Best.-Nr. Order no.**	**Seite Page**
	2 Platten, 2 Säulen, Typ A-C-D	2 plates, 2 leader pins, types A-C-D	**SG 2 .**	**SG. 5 - 8**
	2 Platten, 4 Säulen, Typ Q	2 plates, 4 leader pins, type Q	**SG 2 Q**	**SG. 13 - 16**
	3 Platten, 2 Säulen, Typ A-C-D	3 plates, 2 leader pins, types A-C-D	**SG 3 .**	**SG. 9 - 12**
	3 Platten, 4 Säulen, Typ Q	3 plates, 4 leader pins, type Q	**SG 3 Q**	**SG. 17 - 20**
	2 Platten, 2 Säulen, Typ A-C-D M-Line	2 plates, 2 leader pins, types A-C-D M-Line	**SG 2 . RM**	**SG. 26 - 29**
	2 Platten, 4 Säulen, Typ Q M-Line	2 plates, 4 leader pins, type Q M-Line	**SG 2 Q RM**	**SG. 34 - 37**
	3 Platten, 2 Säulen, Typ A-C-D M-Line	3 plates, 2 leader pins, types A-C-D M-Line	**SG 3 . RM**	**SG. 30 - 33**
	3 Platten, 4 Säulen, Typ Q M-Line	3 plates, 4 leader pins, type Q M-Line	**SG 3 Q RM**	**SG. 38 - 41**

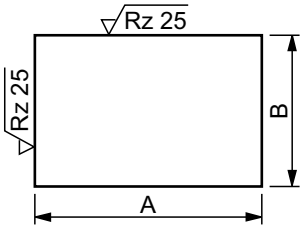
	Großstahlplatten	**XXL - Steel plates**	**Best.-Nr. Order no.**	**Seite Page**
	Großstahlplatten und Stahl-Schweiß-Konstruktionen mit Sonderbearbeitung	XXL - Steel plates and welded units with additional work / secondary operation		**SG. 43 - 46**

Toleranzangaben für Säulengestelle aus Stahl

Tolerance - information regarding steel die sets

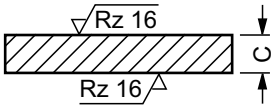
Mat.: C45

Toleranz Außenmaße /
Tolerance of length and width



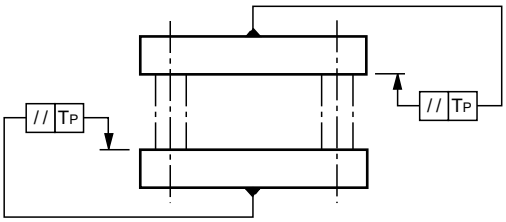
A x B +0,06 / –0,06

Toleranz Plattenstärke /
Tolerance of thickness



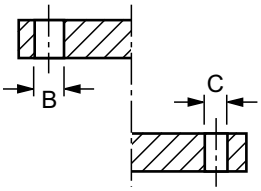
C ± 2

Parallelität der Flächenpaare /
Parallelism of two surfaces



T_P = 0,012 / 100 mm

Bohrungstoleranzen /
Hole tolerances



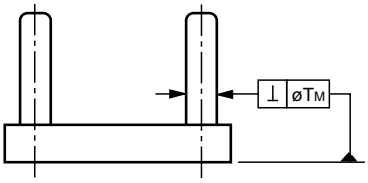
B = Aufnahmebohrung Buchse/ Mounting hole for bushing:

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

C = Aufnahmebohrung Säule/ Mounting hole for leader pin:

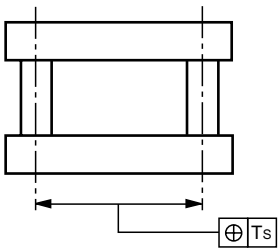
FS 420	= R7
FS 419	= JS6
FS 400/403	= H6

Winkelgenauigkeit der Führungssäulen /
Angular accuracy of leader pins



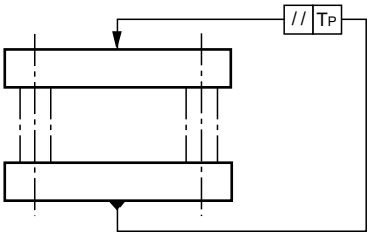
T_M = 0,012 / 100 mm

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



T_S = ± 0,010

Planparallelität im zusammengebauten Zustand /
Parallelism after mounting



T_P = 0,015 / 100 mm

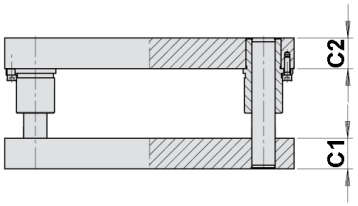
Säulen-Buchsen-Kombination für 2-Plattengestelle

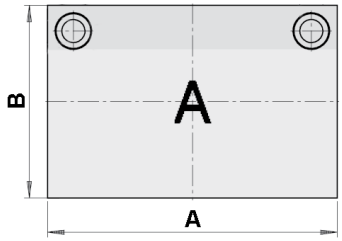
Combination of leader-pin and -bushing in 2-plate-die-sets

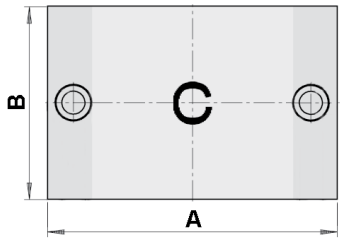
Bestellbeispiel / Order-example

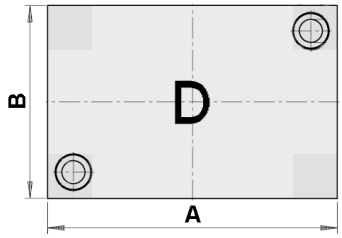
2 C	643	P	41	Z
Gestelltyp Type of die set	Kataloggröße Catalog sizes	Säulentyp Type of leader pin	Buchsentyp Type of bushing	Position der Haltestücke Position of holding clamps

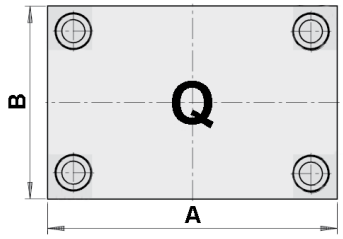
Gestelltyp / Type of die set





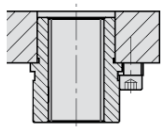
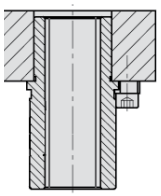
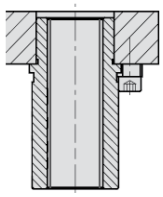




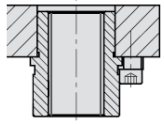
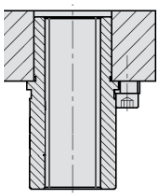
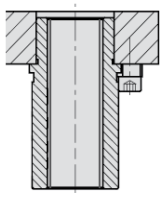


Buchsentyp / Type of bushing

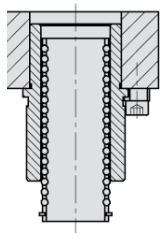
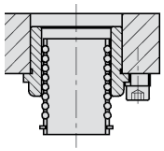
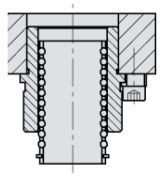
Sinterbuchse
Leader pin bushing, sintered

FS 741	FS 751	FS 755
		
46	47	48

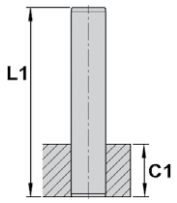
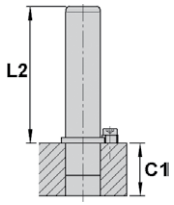
Stahlbuchse mit Bronzeplattierung
Leader pin bushing, bronze plated

FS 641	FS 651	FS 655
		
41	42	43

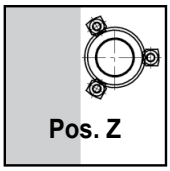
Stahlbuchse mit Ms-Käfig
Leader pin bushing with ball cage

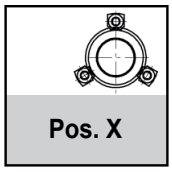
FS 453 + FS 425	FS 457 + FS 425	FS 458 + FS 425
		
51	52	53

Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin with collar
	
FS 420	FS 419
P	R

Position der Haltestücke / Position of holding clamps





Säulen-Buchsen-Kombination für 3-Plattengestelle

Combination of leader-pin and -bushing in 3-plate-die-sets

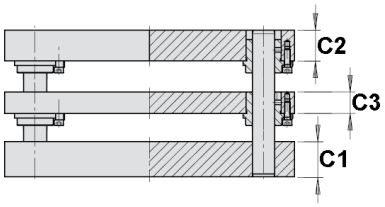
zertifiziert ISO 9001 for you Cert

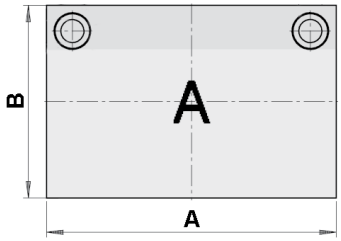
MSPN

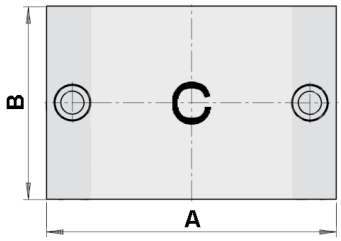
Bestellbeispiel / Order-example

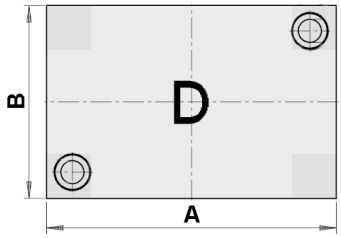
3 C	643	P	71	Z
Gestelltyp Type of die set	Kataloggröße Catalog sizes	Säulentyp Type of leader pin	Buchsentyp Type of bushing	Position der Haltestücke Position of holding clamps

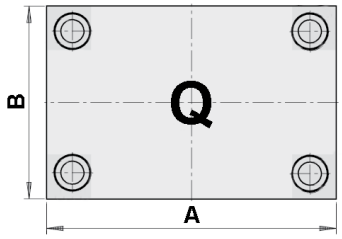
Gestelltyp / Type of die set



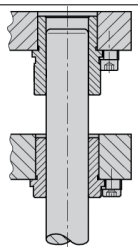
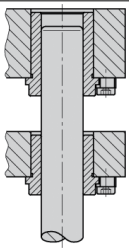
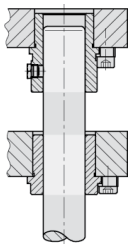
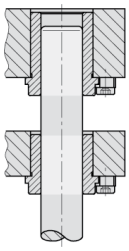
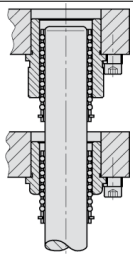
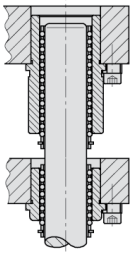




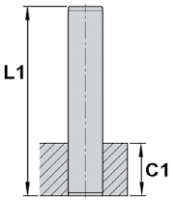
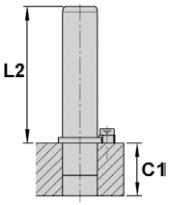




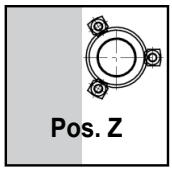
Buchsentyp / Type of bushing

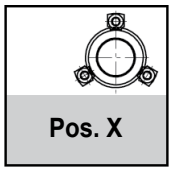
Sinterbuchse Leader pin bushing, sintered	
 C2 = FS 741 C3 = FS 731	 C2 = FS 732 C3 = FS 731
88	87
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
 C2 = FS 641 C3 = FS 631	 C2 = FS 632 C3 = FS 631
71	72
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
 C2 = FS 458 + FS 425 C3 = FS 457 + FS 425	 C2 = FS 453 + FS 425 C3 = FS 457 + FS 425
91	92

Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel- säule mit Bund Leader pin with collar
 FS 420	 FS 419
P	R

Position der Haltestücke / Position of holding clamps


Pos. Z


Pos. X

Bestellbeispiel Sondergrößen

Order-example specials

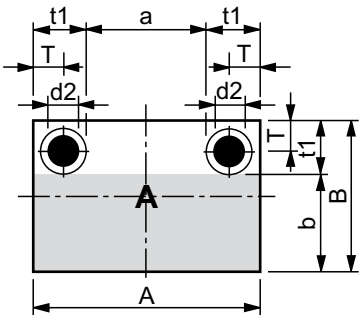
SÄULENGESTELLE / DIE SETS

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

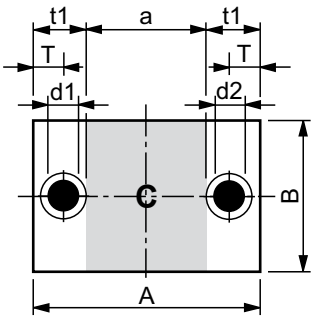
* = Säulentyp in C1 oder C2 bitte angeben. / Please fill in type of leader pin in C1 or C2.
** = Buchsentyp in C1 oder C2 bitte angeben. / Please fill in type of bushing in C1 or C2.

Arbeitsflächen / Working areas

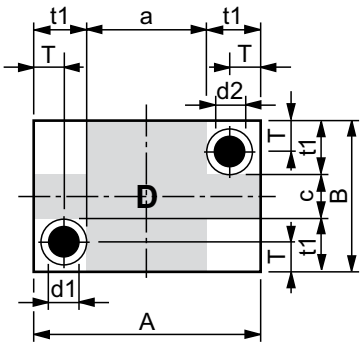
b = B - t1



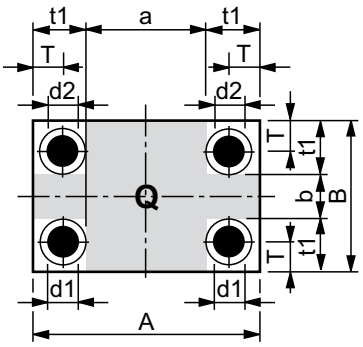
a = A - (2 x t1)



a = A - (2 x t1)
c = B - (2 x t1)



a = A - (2 x t1)
b = B - (2 x t1)



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	–	–

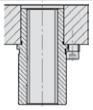
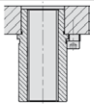
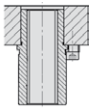
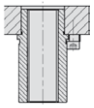
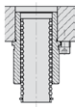
Säulengestelle aus Stahl, 2 Platten, 2 Säulen, Typ A-C-D

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

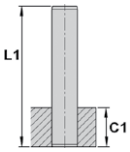
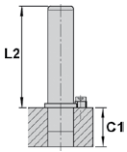
zertifiziert ISO 9001 for you Cert

SÄULENGESTELLE / DIE SETS

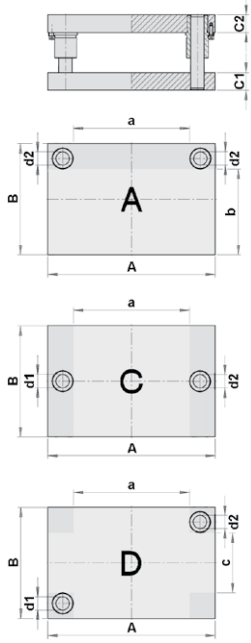
Buchsentyp / Type of bushing

Sinterbuchse Leader pin bushing, sintered		
		
FS 741	FS751	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 press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps

Pos. Z

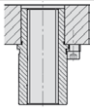
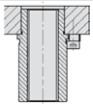
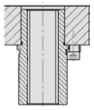
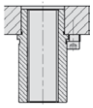
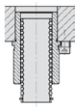
Pos. X

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

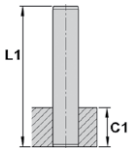
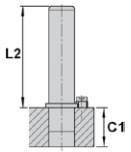
Säulengestelle aus Stahl, 2 Platten, 2 Säulen, Typ A-C-D

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

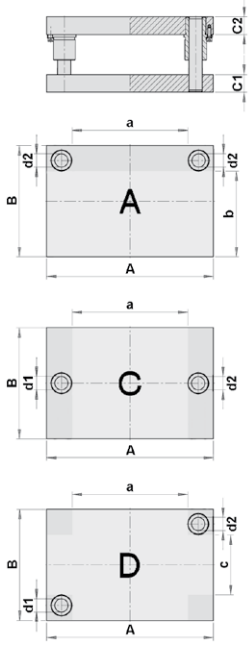
Buchsentyp / Type of bushing

Sinterbuchse Leader pin bushing, sintered		
		
FS 741	FS751	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

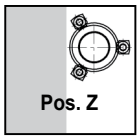
Säulentyp / Type of leader pin

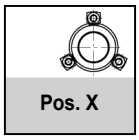
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps


Pos. Z


Pos. X

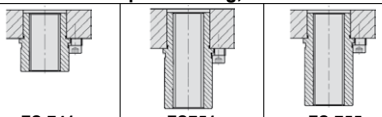
Abmessungen / Dimensions										Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin							46 41	47 42	48 43	51	52	53	
		C1	C2	C3	d1/d2	L1	L2	L3		a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
631	300 X 160	33	28	–	24/25	150	110	–					182 X 160	101 X 300	42 X 300	170 X 160	95 X 300	30 X 300	24,0
632		33	33	–		160	120	–											25,9
633		48	38	–		180	130	120											33,4
634	300 X 200	33	28	–	24/25	150	110	–					182 X 200	141 X 300	82 X 300	170 X 200	135 X 300	70 X 300	29,8
635		33	33	–		160	120	–											32,1
636		48	38	–		180	130	120											41,5
637	300 X 250	38	33	–	30/32	160	120	–					158 X 250	179 X 300	108 X 300	142 X 250	171 X 300	92 X 300	43,3
638		38	38	–		170	130	–											46,3
639		48	38	–		180	130	120											52,5
640	300 X 300	38	33	–	30/32	160	120	–					158 X 300	229 X 300	158 X 300	142 X 300	221 X 300	142 X 300	52,0
641		38	38	–		170	130	–											55,5
642		48	38	–		180	130	120											62,5
643	350 X 200	33	28	–	24/25	150	110	–					232 X 200	141 X 350	82 X 350	220 X 200	135 X 350	70 X 350	34,6
644		33	33	–		160	120	–											37,3
645		48	38	–		180	130	120											48,3
646	350 X 250	38	33	–	30/32	160	120	–					208 X 250	179 X 350	108 X 350	192 X 250	171 X 350	92 X 350	50,5
647		38	38	–		170	130	–											54,0
648		48	38	–		180	130	120											61,0
649	350 X 300	48	38	–	40/42	190	140	–					188 X 300	219 X 350	138 X 350	172 X 300	211 X 350	122 X 350	74,0
650		48	48	–		200	150	–											82,5
651		58	48	–		210	150	140											90,5
652	350 X 350	48	38	–	40/42	190	140	–					188 X 350	269 X 350	188 X 350	172 X 350	261 X 350	172 X 350	86,0
653		48	48	–		200	150	–											95,5
654		58	48	–		210	150	140											105,0
655	400 X 200	33	28	–	24/25	150	110	–					282 X 200	141 X 400	82 X 400	270 X 200	135 X 400	70 X 400	39,4
656		33	33	–		160	120	–											42,5
657		48	38	–		180	130	120											55,0
658	400 X 250	38	33	–	30/32	160	120	–					258 X 250	179 X 400	108 X 400	242 X 250	171 X 400	92 X 400	57,5
659		38	38	–		170	130	–											61,5
660		48	38	–		180	130	120											69,0

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

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

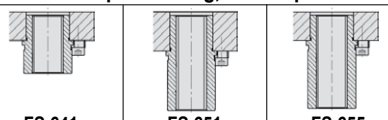
Buchsentyp / Type of bushing

Sinterbuchse
Leader pin bushing, sintered



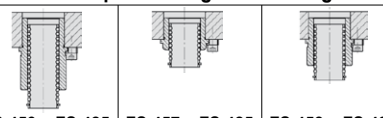
FS 741	FS751	FS 755
46	47	48

Stahlbuchse mit Bronzeplattierung
Leader pin bushing, bronze plated



FS 641	FS 651	FS 655
41	42	43

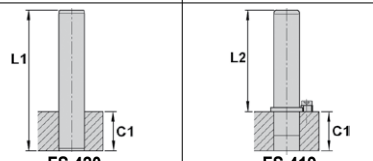
Stahlbuchse mit Ms-Käfig
Leader pin bushing with ball cage



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

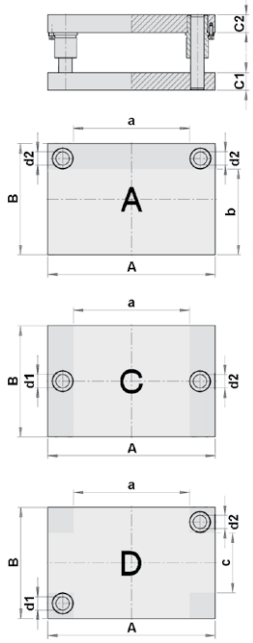
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar

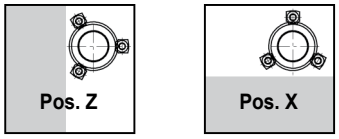


FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps

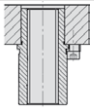
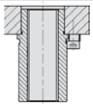
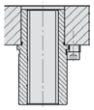
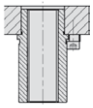
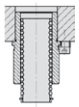


Abmessungen / Dimensions										Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin							46 41	47 42	48 43	51	52	53	Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3		a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
661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

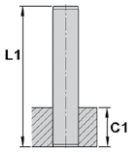
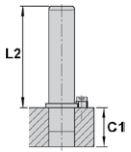
Säulengestelle aus Stahl, 2 Platten, 2 Säulen, Typ A-C-D

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

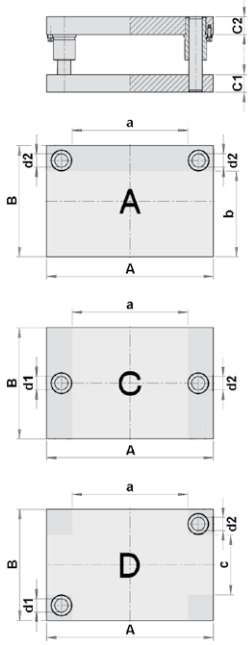
Buchsentyp / Type of bushing

Sinterbuchse Leader pin bushing, sintered		
		
FS 741	FS751	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

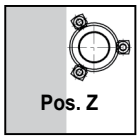
Säulentyp / Type of leader pin

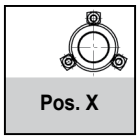
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps


Pos. Z

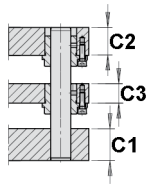

Pos. X

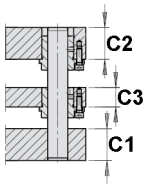
Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						46 41	47 42	48 43	51	52	53	
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
691	600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

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

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

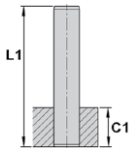
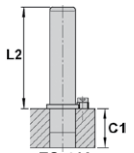
Buchsentyp / Type of bushing



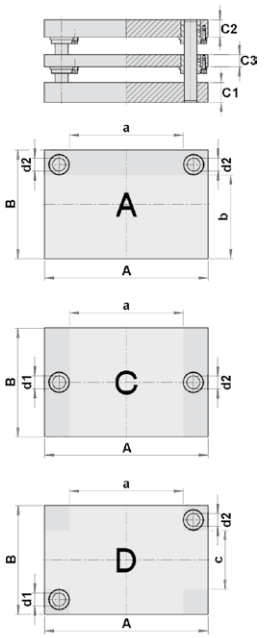


Sinterbuchse Leader pin bushing, sintered	
C2: FS 741 C3: FS 731	C2: FS 732 C3: FS 731
88	87
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 641 C3: FS 631	C2: FS 632 C3: FS 631
71	72
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 458 + FS 425 C3: FS 457 + FS 425	C2: FS 453 + FS 425 C3: FS 457 + FS 425
91	92

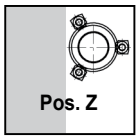
Säulentyp / Type of leader pin

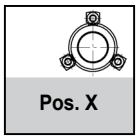
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position holding clamps



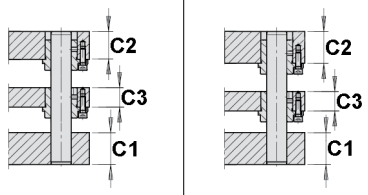


Größe / Size	A X B	Abmessungen / Dimensions: Platten-stärke Plate thickness C1	C2	C3	Ø d1/d2	Säulen-länge Length of leader pin L1	L2	L3	Arbeitsflächen / Working area: a X B	b X A	c X A	88 71: a X B	b X A	c X A	87 72: a X B	b X A	c X A	91 92: a X B	b X A	c X A	Gewicht / Weight [kg]
601	125 X 125	28	23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

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

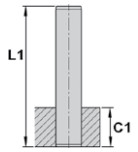
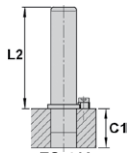
Steel die sets, 3 plates, 2 posts, types A-C-D

Buchsentyp / Type of bushing

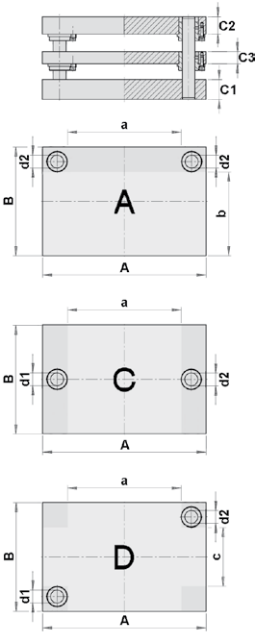


Sinterbuchse Leader pin bushing, sintered	
C2: FS 741 C3: FS 731	C2: FS 732 C3: FS 731
88	87
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 641 C3: FS 631	C2: FS 632 C3: FS 631
71	72
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 458 + FS 425 C3: FS 457 + FS 425	C2: FS 453 + FS 425 C3: FS 457 + FS 425
91	92

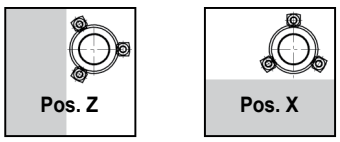
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps

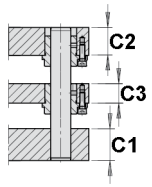


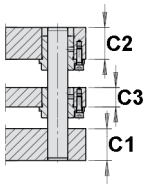
Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						88 71	87 72		91	92		
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
631	300 X 160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

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

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

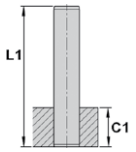
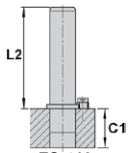
Buchsentyp / Type of bushing



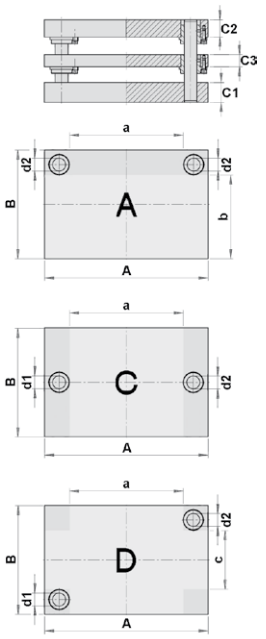


Sinterbuchse Leader pin bushing, sintered	
C2: FS 741 C3: FS 731	C2: FS 732 C3: FS 731
88	87
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 641 C3: FS 631	C2: FS 632 C3: FS 631
71	72
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 458 + FS 425 C3: FS 457 + FS 425	C2: FS 453 + FS 425 C3: FS 457 + FS 425
91	92

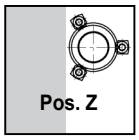
Säulentyp / Type of leader pin

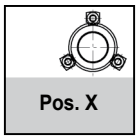
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



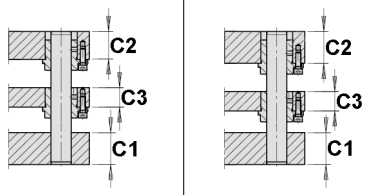


Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						88 87 71 72			91 92			
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
661	400 X 300	48	38	33	40/42	200	160	–				238 X 300	219 X 400	138 X 400	222 X 300	211 X 400	122 X 400	115,0
662		58	48			220	170	–										134,0
663		58	58			230	170	160										144,0
664	400 X 350	48	38	33	40/42	200	160	–				238 X 350	269 X 400	188 X 400	222 X 350	261 X 400	172 X 400	134,0
665		58	48			220	170	–										156,0
666		58	58			230	170	160										167,0
667	400 X 400	48	38	33	40/42	200	160	–				238 X 400	319 X 400	238 X 400	222 X 400	311 X 400	222 X 400	153,0
668		58	48			220	170	–										178,0
669		58	58			230	170	160										190,0
670	500 X 250	38	33	28	30/32	170	140	–				358 X 250	179 X 500	108 X 500	342 X 250	171 X 500	92 X 500	99,0
671		48	38			190	150	–										114,0
672		48	48			200	150	140										124,0
673	500 X 300	48	38	33	40/42	200	160	–				338 X 300	219 X 500	138 X 500	322 X 300	211 X 500	122 X 500	143,0
674		58	48			220	170	–										167,0
675		58	58			230	170	160										179,0
676	500 X 350	48	38	33	40/42	200	160	–				338 X 350	269 X 500	188 X 500	322 X 350	261 X 500	172 X 500	167,0
677		58	48			220	170	–										194,0
678		58	58			230	170	160										208,0
679	500 X 400	48	38	33	40/42	200	160	–				338 X 400	319 X 500	238 X 500	322 X 400	311 X 500	222 X 500	190,0
680		58	48			220	170	–										222,0
681		58	58			230	170	160										237,0
682	500 X 500	58	48	38	50/52	230	180	–				306 X 500	403 X 500	306 X 500	290 X 500	395 X 500	290 X 500	287,0
683		68	58			250	200	–										327,0
684		68	68			260	200	180										346,0
685	600 X 300	58	48	38	50/52	230	180	–				406 X 300	203 X 600	106 X 600	390 X 300	195 X 600	90 X 600	208,0
686		68	58			250	200	–										237,0
687		68	68			260	200	180										251,0
688	600 X 350	58	48	38	50/52	230	180	–				406 X 350	253 X 600	156 X 600	390 X 350	245 X 600	140 X 600	242,0
689		68	58			250	200	–										275,0
690		68	68			260	200	180										292,0

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

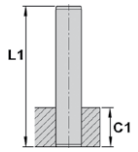
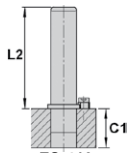
Steel die sets, 3 plates, 2 posts, types A-C-D

Buchsentyp / Type of bushing

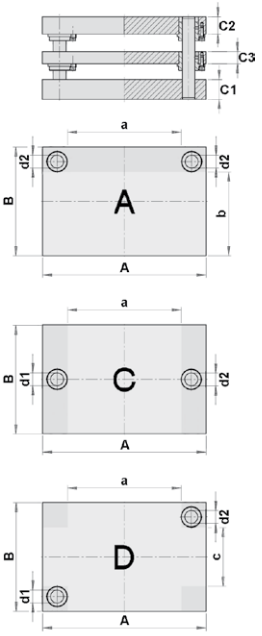


Sinterbuchse Leader pin bushing, sintered	
C2: FS 741 C3: FS 731	C2: FS 732 C3: FS 731
88	87
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 641 C3: FS 631	C2: FS 632 C3: FS 631
71	72
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 458 + FS 425 C3: FS 457 + FS 425	C2: FS 453 + FS 425 C3: FS 457 + FS 425
91	92

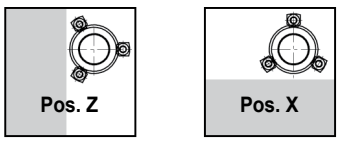
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps

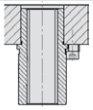
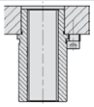
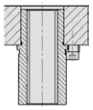
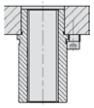
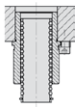


Größe / Size	A X B	Platten-stärke Plate thickness C1	C2	C3	Ø d1/d2	Säulen-länge Length of leader pin L1	L2	L3	Arbeitsflächen / Working area a X B / b X A / c X A			88 71 a X B	87 72 b X A	c X A	91 a X B	92 b X A	c X A	Gewicht / Weight [kg]
691	600 X 400	58	48	38	50/52	230	180	–				406 X 400	303 X 600	206 X 600	390 X 400	295 X 600	190 X 600	276,0
692		68	58			250	200	–										314,0
693		68	68			260	200	180										333,0
694	600 X 500	58	48	38	50/52	230	180	–				406 X 500	403 X 600	306 X 600	390 X 500	395 X 600	290 X 600	344,0
695		68	58			250	200	–										391,0
696		68	68			260	200	180										415,0
697	600 X 600	58	48	38	50/52	230	180	–				406 X 600	503 X 600	406 X 600	390 X 600	495 X 600	390 X 600	412,0
698		68	58			250	200	–										468,0
699		68	68			260	200	180										497,0
700	700 X 350	58	48	38	50/52	230	180	–				506 X 350	253 X 700	156 X 700	490 X 350	245 X 700	140 X 700	282,0
701		68	58			250	200	–										320,0
702		68	68			260	200	180										340,0
703	700 X 400	58	48	38	50/52	230	180	–				506 X 400	303 X 700	206 X 700	490 X 400	295 X 700	190 X 700	321,0
704		68	58			250	200	–										365,0
705		68	68			260	200	180										387,0
706	700 X 500	58	48	38	50/52	230	180	–				506 X 500	403 X 700	306 X 700	490 X 500	395 X 700	290 X 700	400,0
707		68	58			250	200	–										455,0
708		68	68			260	200	180										483,0
709	700 X 600	58	48	38	50/52	230	180	–				506 X 600	503 X 700	406 X 700	490 X 600	495 X 700	390 X 700	480,0
710		68	58			250	200	–										545,0
711		68	68			260	200	180										579,0
712	800 X 400	58	48	38	50/52	230	180	–				606 X 400	303 X 800	206 X 800	590 X 400	295 X 800	190 X 800	366,0
713		68	58			250	200	–										417,0
714		68	68			260	200	180										442,0
715	800 X 500	58	48	38	50/52	230	180	–				606 X 500	403 X 800	306 X 800	590 X 500	395 X 800	290 X 800	457,0
716		68	58			250	200	–										520,0
717		68	68			260	200	180										551,0
718	800 X 600	58	48	38	50/52	230	180	–				606 X 600	503 X 800	406 X 800	590 X 600	495 X 800	390 X 800	547,0
719		68	58			250	200	–										623,0
720		68	68			260	200	180										661,0

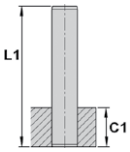
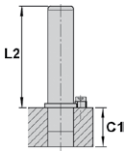
Säulengestelle aus Stahl, 2 Platten, 4 Säulen, Typ Q

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

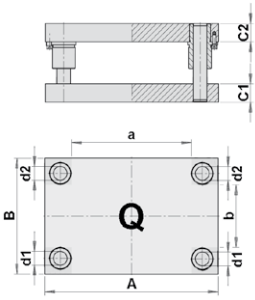
Buchsentyp / Type of bushing

Sinterbuchse Leader pin bushing, sintered		
		
FS 741	FS751	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

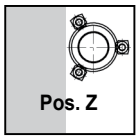
Säulentyp / Type of leader pin

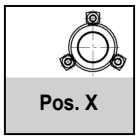
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position holding clamps


Pos. Z


Pos. X

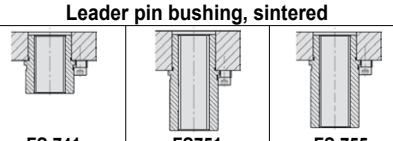
Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						46 41	47 42	48 43	51	52	53	
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
601	125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

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

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

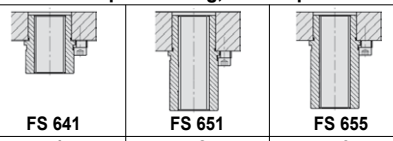
Buchsentyp / Type of bushing

Sinterbuchse
Leader pin bushing, sintered



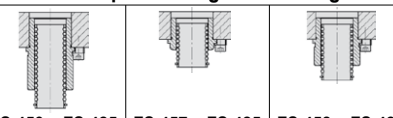
FS 741	FS751	FS 755
46	47	48

Stahlbuchse mit Bronzeplattierung
Leader pin bushing, bronze plated



FS 641	FS 651	FS 655
41	42	43

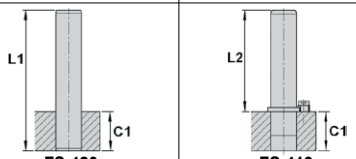
Stahlbuchse mit Ms-Käfig
Leader pin bushing with ball cage



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

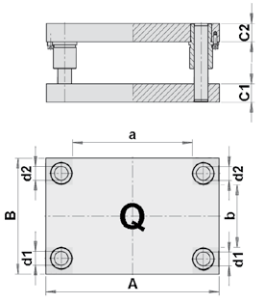
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar

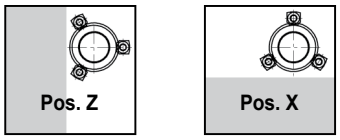


FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps

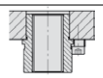
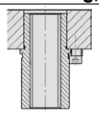
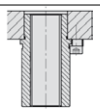
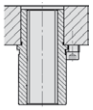
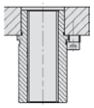
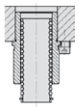


Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						46 41	47 42	48 43	51	52	53	
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
631	300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

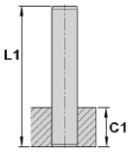
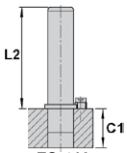
Säulengestelle aus Stahl, 2 Platten, 4 Säulen, Typ Q

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

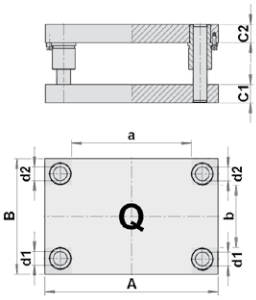
Buchsentyp / Type of bushing

Sinterbuchse Leader pin bushing, sintered		
		
FS 741	FS751	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

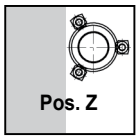
Säulentyp / Type of leader pin

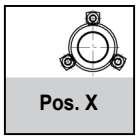
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position holding clamps


Pos. Z

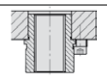
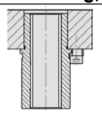
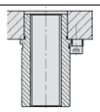
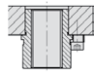
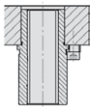
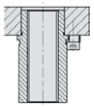
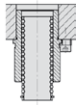

Pos. X

Abmessungen / Dimensions									Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						46 41	47 42	48 43	51	52	53	Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
661	400 X 300	48	38	–	40/42	190	140	–				238 X 300	138 X 400		222 X 300	122 X 400		87,0
662		48	48	–		200	150	–										96,5
663		58	48	–		210	150	140										106,0
664	400 X 350	48	38	–	40/42	190	140	–				238 X 350	188 X 400		222 X 350	172 X 400		101,0
665		48	48	–		200	150	–										112,0
666		58	48	–		210	150	140										123,0
667	400 X 400	48	38	–	40/42	190	140	–				238 X 400	238 X 400		222 X 400	222 X 400		114,0
668		48	48	–		200	150	–										127,0
669		58	48	–		210	150	140										140,0
670	500 X 250	38	33	–	30/32	160	120	–				358 X 250	108 X 500		342 X 250	92 X 500		73,0
671		38	38	–		170	130	–										78,0
672		48	38	–		180	130	120										87,5
673	500 X 300	48	38	–	40/42	190	140	–				338 X 300	138 X 500		322 X 300	122 X 500		108,0
674		48	48	–		200	150	–										119,0
675		58	48	–		210	150	140										131,0
676	500 X 350	48	38	–	40/42	190	140	–				338 X 350	188 X 500		322 X 350	172 X 500		125,0
677		48	48	–		200	150	–										138,0
678		58	48	–		210	150	140										152,0
679	500 X 400	48	38	–	40/42	190	140	–				338 X 400	238 X 500		322 X 400	222 X 500		141,0
680		48	48	–		200	150	–										157,0
681		58	48	–		210	150	140										173,0
682	500 X 500	48	38	–	40/42	190	140	–				338 X 500	338 X 500		322 X 500	322 X 500		175,0
683		48	48	–		200	150	–										195,0
684		58	48	–		210	150	140										214,0
685	600 X 300	48	38	–	40/42	190	140	–				438 X 300	138 X 600		422 X 300	122 X 600		128,0
686		48	48	–		200	150	–										142,0
687		58	48	–		210	150	140										156,0
688	600 X 350	48	38	–	40/42	190	140	–				438 X 350	188 X 600		422 X 350	172 X 600		148,0
689		48	48	–		200	150	–										165,0
690		58	48	–		210	150	140										181,0

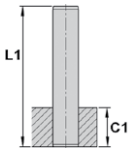
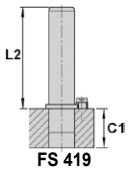
Säulengestelle aus Stahl, 2 Platten, 4 Säulen, Typ Q

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

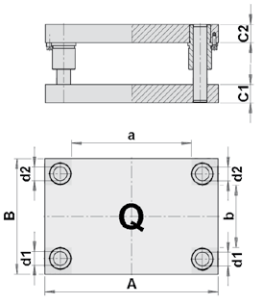
Buchsentyp / Type of bushing

Sinterbuchse Leader pin bushing, sintered		
		
FS 741	FS751	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

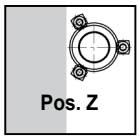
Säulentyp / Type of leader pin

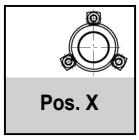
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps


Pos. Z

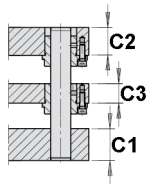

Pos. X

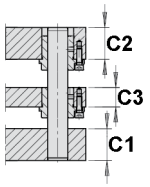
Abmessungen / Dimensions										Arbeitsflächen / Working area										
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin							46 41	47 42	48 43	51	52	53		Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3		a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A		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

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

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

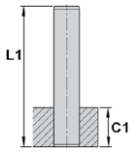
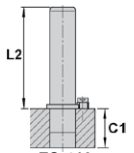
Buchsentyp / Type of bushing



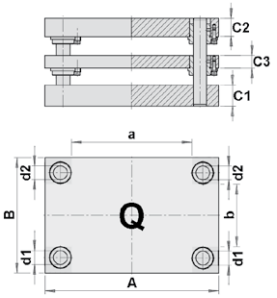


Sinterbuchse Leader pin bushing, sintered	
C2: FS 741 C3: FS 731	C2: FS 732 C3: FS 731
88	87
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 641 C3: FS 631	C2: FS 632 C3: FS 631
71	72
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 458 + FS 425 C3: FS 457 + FS 425	C2: FS 453 + FS 425 C3: FS 457 + FS 425
91	92

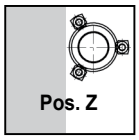
Säulentyp / Type of leader pin

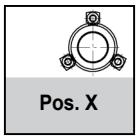
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



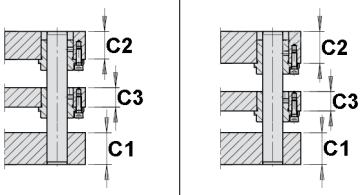


Abmessungen / Dimensions										Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin							88 87 71 72			91 92			Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3		a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
601	125 X 125	28	23	18	18/19	140	120	–					27 X 125	27 X 125					10,0
602		38	28			160	130	–											11,8
603		38	38			170	130	120											13,1
604	160 X 125	28	23	18	18/19	140	120	–					62 X 125	27 X 160					12,4
605		38	28			160	130	–											14,2
606		38	38			170	130	120											16,3
607	160 X 160	28	23	18	18/19	140	120	–					62 X 160	62 X 160		50 X 160	50 X 160		15,4
608		38	28			160	130	–											18,4
609		38	38			170	130	120											20,4
610	200 X 125	28	23	18	18/19	140	120	–					102 X 125	27 X 200		90 X 125			15,1
611		38	28			160	130	–											18,0
612		38	38			170	130	120											20,0
613	200 X 160	28	23	18	18/19	140	120	–					102 X 160	62 X 200		90 X 160	50 X 200		18,9
614		38	28			160	130	–											22,6
615		38	38			170	130	120											25,2
616	200 X 200	28	23	18	18/19	140	120	–					102 X 200	102 X 200		90 X 200	90 X 200		23,2
617		38	28			160	130	–											27,9
618		38	38			170	130	120											31,1
619	250 X 125	28	23	18	18/19	140	120	–					152 X 125	27 X 250		140 X 125			18,5
620		38	28			160	130	–											22,1
621		38	38			170	130	120											24,6
622	250 X 160	28	23	18	18/19	140	120	–					152 X 160	60 X 250		140 X 160	50 X 250		23,2
623		38	28			160	130	–											27,9
624		38	38			170	130	120											31,1
625	250 X 200	33	28	23	24/25	160	130	–					132 X 200	82 X 250		120 X 200	70 X 250		35,0
626		48	38			190	150	–											44,8
627		48	48			200	150	140											48,7
628	250 X 250	33	28	23	24/25	160	130	–					132 X 250	132 X 250		120 X 250	120 X 250		43,2
629		48	38			190	150	–											55,5
630		48	48			200	150	140											60,5

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

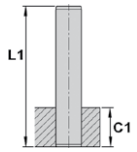
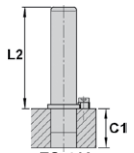
Steel die sets, 3 plates, 4 posts, type Q

Buchsentyp / Type of bushing

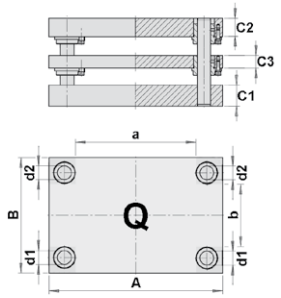


Sinterbuchse Leader pin bushing, sintered	
C2: FS 741 C3: FS 731	C2: FS 732 C3: FS 731
88	87
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 641 C3: FS 631	C2: FS 632 C3: FS 631
71	72
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 458 + FS 425 C3: FS 457 + FS 425	C2: FS 453 + FS 425 C3: FS 457 + FS 425
91	92

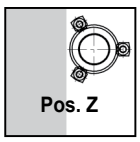
Säulentyp / Type of leader pin

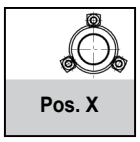
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



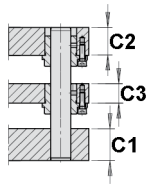


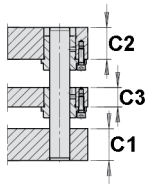
Abmessungen / Dimensions									Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						88 71	87 72		91	92		Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
631	300 X 160	33	28	23	24/25	160	130	–				182 X 160	42 X 300		170 X 160	30 X 300		33,7
632		48	38			190	150	–										43,1
633		48	48			200	150	140										46,9
634	300 X 200	33	28	23	24/25	160	130	–				182 X 200	82 X 300		170 X 200	70 X 300		41,6
635		48	38			190	150	–										53,5
636		48	48			200	150	140										58,5
637	300 X 250	38	33	28	30/32	170	140	–				158 X 250	108 X 300		142 X 250	92 X 300		61,5
638		48	38			190	150	–										70,5
639		48	48			200	150	140										76,0
640	300 X 300	38	33	28	30/32	170	140	–				158 X 300	158 X 300		142 X 300	142 X 300		73,0
641		48	38			190	150	–										83,5
642		48	48			200	150	140										90,5
643	350 X 200	33	28	23	24/25	160	130	–				232 X 200	82 X 350		220 X 200	70 X 350		48,2
644		48	38			190	150	–										62,0
645		48	48			200	150	140										67,5
646	350 X 250	38	33	28	30/32	170	140	–				208 X 250	108 X 350		192 X 250	92 X 350		71,0
647		48	38			190	150	–										81,5
648		48	48			200	150	140										88,5
649	350 X 300	38	33	28	30/32	170	140	–				208 X 300	158 X 350		192 X 300	142 X 350		85,0
650		48	38			190	150	–										97,0
651		48	48			200	150	140										105,0
652	350 X 350	38	33	28	30/32	170	140	–				208 X 350	208 X 350		192 X 350	192 X 350		98,5
653		48	38			190	150	–										113,0
654		48	48			200	150	140										123,0
655	400 X 200	33	28	23	24/25	160	130	–				282 X 200	82 X 400		270 X 200	70 X 400		55,0
656		48	38			190	150	–										70,5
657		48	48			200	150	130										77,0
658	400 X 250	38	33	28	30/32	170	140	–				258 X 250	108 X 400		242 X 250	92 X 400		81,0
659		48	38			190	150	–										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

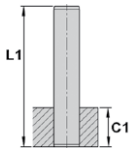
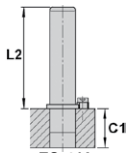
Buchsentyp / Type of bushing



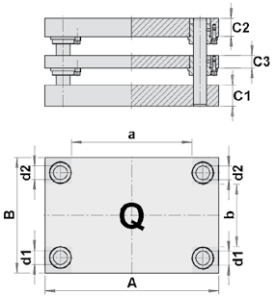


Sinterbuchse Leader pin bushing, sintered	
C2: FS 741 C3: FS 731	C2: FS 732 C3: FS 731
88	87
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 641 C3: FS 631	C2: FS 632 C3: FS 631
71	72
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 458 + FS 425 C3: FS 457 + FS 425	C2: FS 453 + FS 425 C3: FS 457 + FS 425
91	92

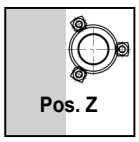
Säulentyp / Type of leader pin

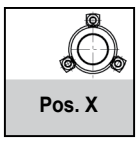
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



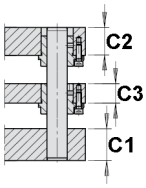


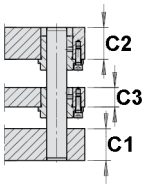
Abmessungen / Dimensions									Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						88 87 71 72			91 92			Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
661	400 X 300	48	38	33	40/42	200	160	–				238 X 300	138 X 400		222 X 300	122 X 400		118,0
662		58	48			220	170	–										137,0
663		58	58			230	170	160										147,0
664	400 X 350	48	38	33	40/42	200	160	–				238 X 350	188 X 400		222 X 350	172 X 400		137,0
665		58	48			220	170	–										159,0
666		58	58			230	170	160										170,0
667	400 X 400	48	38	33	40/42	200	160	–				238 X 400	238 X 400		222 X 400	222 X 400		156,0
668		58	48			220	170	–										181,0
669		58	58			230	170	160										194,0
670	500 X 250	38	33	28	30/32	170	140	–				358 X 250	108 X 500		342 X 250	92 X 500		100,0
671		48	38			190	150	–										115,0
672		48	48			200	150	140										125,0
673	500 X 300	48	38	33	40/42	200	160	–				338 X 300	138 X 500		322 X 300	122 X 500		146,0
674		58	48			220	170	–										170,0
675		58	58			230	170	160										182,0
676	500 X 350	48	38	33	40/42	200	160	–				338 X 350	188 X 500		322 X 350	172 X 500		170,0
677		58	48			220	170	–										197,0
678		58	58			230	170	160										211,0
679	500 X 400	48	38	33	40/42	200	160	–				338 X 400	238 X 500		322 X 400	222 X 500		193,0
680		58	48			220	170	–										225,0
681		58	58			230	170	160										240,0
682	500 X 500	48	38	33	40/42	200	160	–				338 X 500	338 X 500		322 X 500	322 X 500		240,0
683		58	48			220	170	–										279,0
684		58	58			230	170	160										299,0
685	600 X 300	48	38	33	40/42	200	160	–				438 X 300	138 X 600		422 X 300	122 X 600		174,0
686		58	48			220	170	–										203,0
687		58	58			230	170	160										217,0
688	600 X 350	48	38	33	40/42	200	160	–				438 X 350	188 X 600		422 X 350	172 X 600		202,0
689		58	48			220	170	–										235,0
690		58	58			230	170	160										252,0

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

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

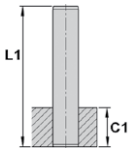
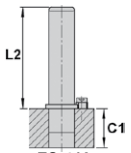
Buchsentyp / Type of bushing



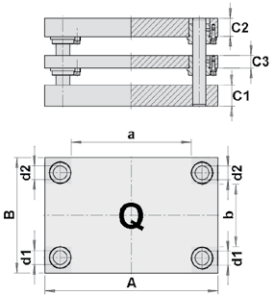


Sinterbuchse Leader pin bushing, sintered	
C2: FS 741 C3: FS 731	C2: FS 732 C3: FS 731
88	87
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 641 C3: FS 631	C2: FS 632 C3: FS 631
71	72
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 458 + FS 425 C3: FS 457 + FS 425	C2: FS 453 + FS 425 C3: FS 457 + FS 425
91	92

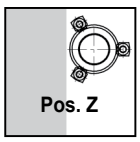
Säulentyp / Type of leader pin

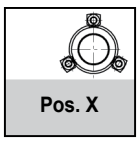
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 420	FS 419
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps





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

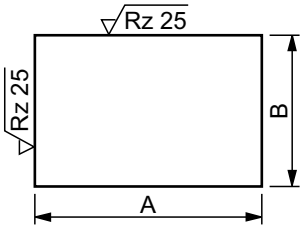
Toleranzangaben für Säulengestelle aus Stahl, M-Line

Tolerance - information regarding steel die sets, M-Line

SÄULENGESTELLE / DIE SETS

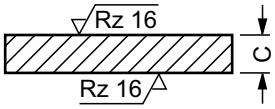
Mat.: C45

Toleranz Außenmaße /
Tolerance of length and width



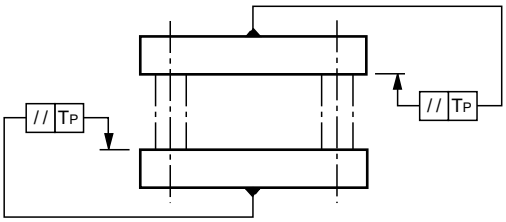
A x B +0,06 / –0,06

Toleranz Plattenstärke /
Tolerance of thickness



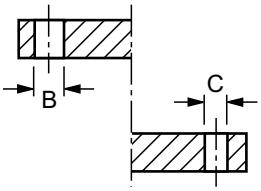
C ± 2

Parallelität der Flächenpaare /
Parallelism of two surfaces



TP = 0,012 / 100 mm

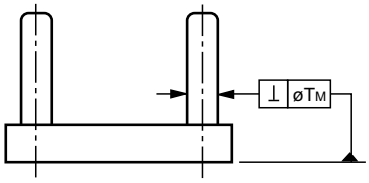
Bohrungstoleranzen /
Hole tolerances



B = Aufnahmebohrung Buchse/ Mounting hole for bushing:
FS 4 . . = H6
FS 6 . . = H6

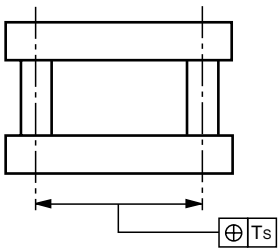
C = Aufnahmebohrung Säule/ Mounting hole for leader pin:
FS 320 = R7
FS 319 = JS6

Winkelgenauigkeit der Führungssäulen /
Angular accuracy of leader pins



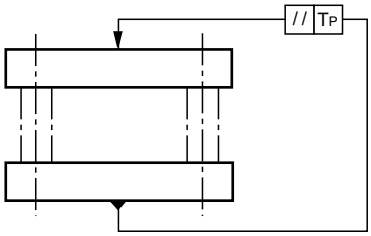
TM = 0,012 / 100 mm

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

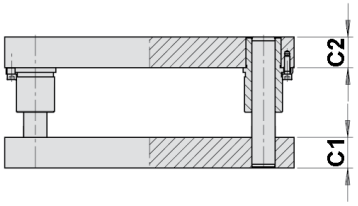
Säulen-Buchsen-Kombination für 2-Plattengestelle, M-Line

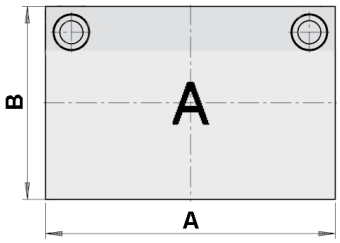
Combination of leader-pin and -bushing in 2-plate-die-sets, M-Line

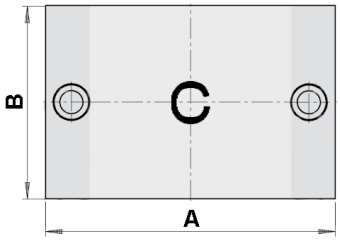
Bestellbeispiel / Order-example

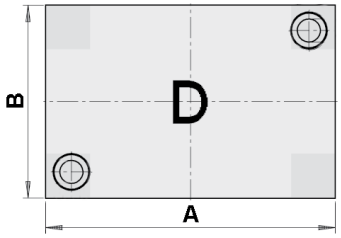
2 C	343	P	141	Z
Gestelltyp Type of die set	Kataloggröße Catalog sizes	Säulentyp Type of leader pin	Buchsentyp Type of bushing	Position der Haltestücke Position of holding clamps

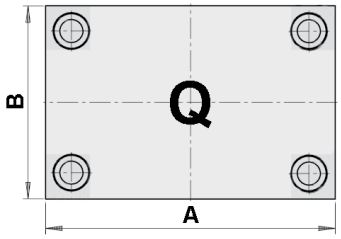
Gestelltyp / Type of die set



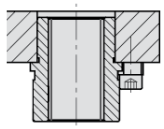
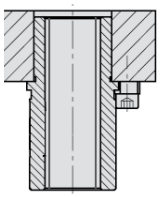
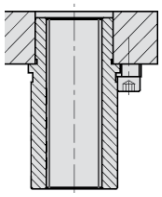


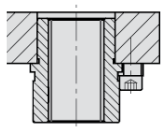
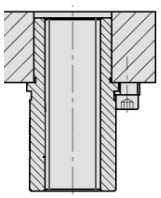
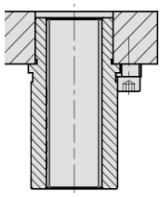


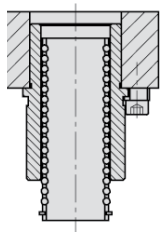
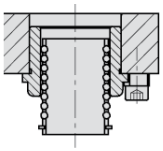
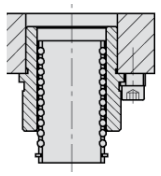




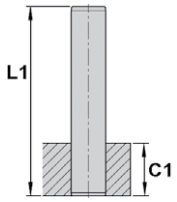
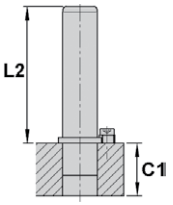
Buchsentyp / Type of bushing

Stahlbuchse, RM-beschichtet Leader pin bushing, RM plated		
		
FS 330 RM	FS 340 RM	FS 350 RM
141	142	143

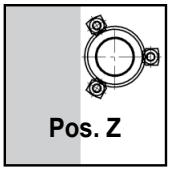
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated		
		
FS 331	FS 351	FS 355
131	132	133

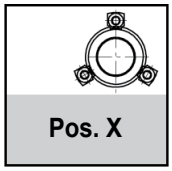
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage		
		
FS 353 + FS 325	FS 357 + FS 325	FS 358 + FS 325
151	152	153

Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin with collar
	
FS 320	FS 319
P	R

Position der Haltestücke / Position of holding clamps





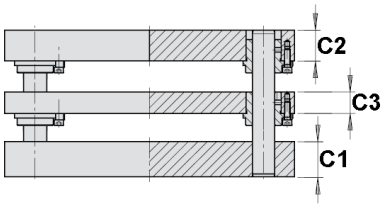
Säulen-Buchsen-Kombination für 3-Plattengestelle, M-Line

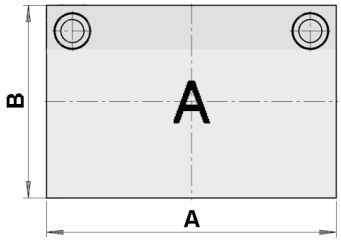
Combination of leader-pin and -bushing in 3-plate-die-sets, M-Line

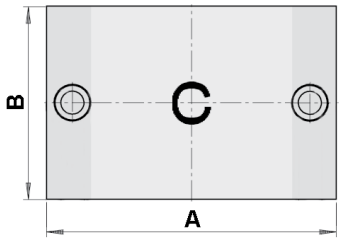
Bestellbeispiel / Order-example

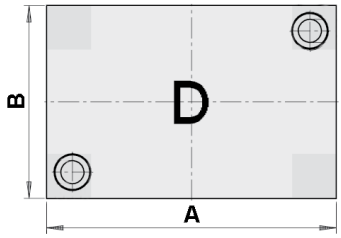
3 C	343	P	182	Z
Gestelltyp Type of die set	Kataloggröße Catalog sizes	Säulentyp Type of leader pin	Buchsentyp Type of bushing	Position der Haltestücke Position of holding clamps

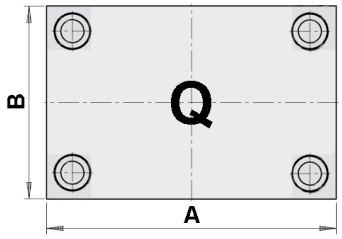
Gestelltyp / Type of die set





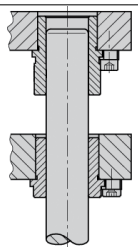






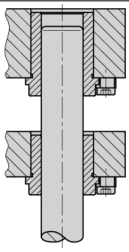
Buchsentyp / Type of bushing

Stahlbuchse, RM-beschichtet
Leader pin bushing, RM plated



C2 = FS 340 RM
C3 = FS 330 RM

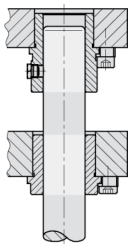
182



C2 = FS 350 RM
C3 = FS 330 RM

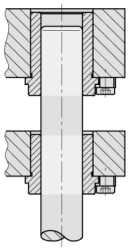
183

Stahlbuchse mit Bronzeplattierung
Leader pin bushing, bronze plated



C2 = FS 351
C3 = FS 331

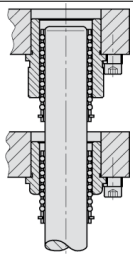
172



C2 = FS 355
C3 = FS 331

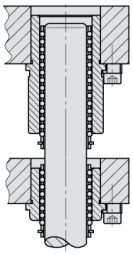
173

Stahlbuchse mit Ms-Käfig
Leader pin bushing with ball cage



C2 = FS 358 + FS 325
C3 = FS 357 + FS 325

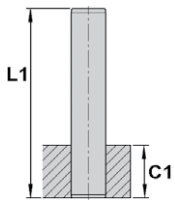
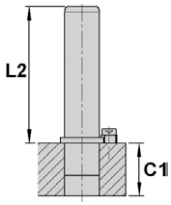
192



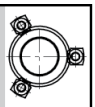
C2 = FS 353 + FS 325
C3 = FS 357 + FS 325

193

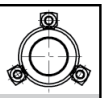
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin with collar
	
FS 320	FS 319
P	**R**

Position der Haltestücke / Position of holding clamps



Pos. Z



Pos. X

Bestellbeispiel Sondergrößen, M-Line

Order-example specials, M-Line

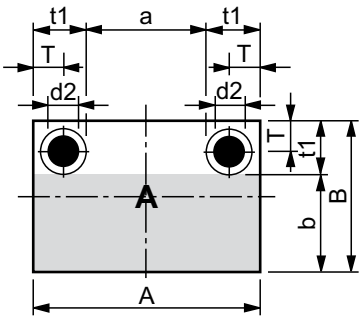
SÄULENGESTELLE / DIE SETS

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

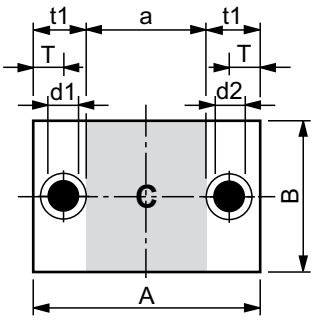
* = Säulentyp in C1 oder C2 bitte angeben. / Please fill in type of leader pin in C1 or C2.
** = Buchsentyp in C1 oder C2 bitte angeben. / Please fill in type of bushing in C1 or C2.

Arbeitsflächen / Working areas

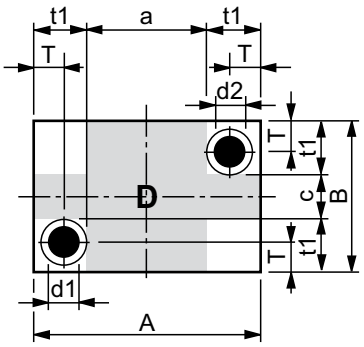
b = B - t1



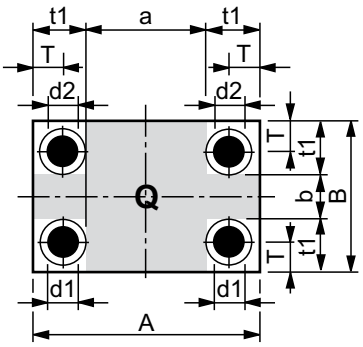
a = A - (2 x t1)



a = A - (2 x t1)
c = B - (2 x t1)

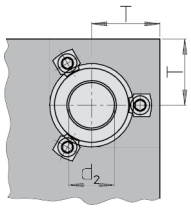


a = A - (2 x t1)
b = B - (2 x t1)



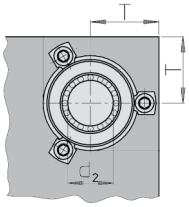
Führungsbuchsen mit Bund

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

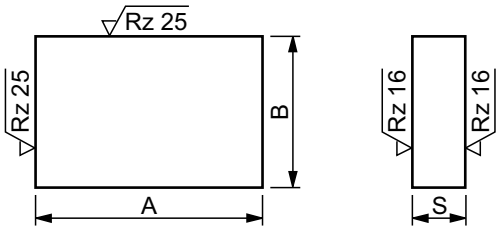
Größen Systemplatten, M-Line

Sizes systemplates, M-Line

SÄULENGESTELLE / DIE SETS

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

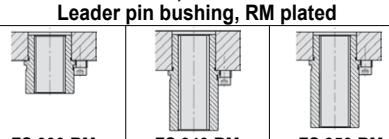
A x B	S							
	18	23	28	33	38	48	58	68
125 x 125	●	●	●		●			
160 x 125	●	●	●		●			
160 x 160	●	●	●		●			
200 x 125	●	●	●		●			
200 x 160	●	●	●	●	●	●		
200 x 200	●	●	●	●	●	●		
250 x 125	●	●	●	●	●	●		
250 x 160	●	●	●	●	●	●		
250 x 200		●	●	●	●	●		
250 x 250		●	●	●	●	●		
300 x 160		●	●	●	●	●		
300 x 200		●	●	●	●	●		
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					●	●	●	●

Säulengest. a. Stahl, 2 Platten, 2 Säulen, Typ A-C-D, M-Line

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

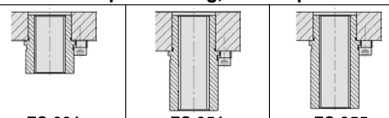
Buchsentyp / Type of bushing

Stahlbuchse, RM-beschichtet
Leader pin bushing, RM plated



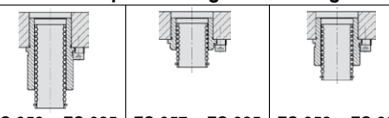
FS 330 RM	FS 340 RM	FS 350 RM
141	142	143

Stahlbuchse mit Bronzeplattierung
Leader pin bushing, bronze plated



FS 331	FS 351	FS 355
131	132	133

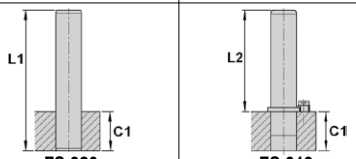
Stahlbuchse mit Ms-Käfig
Leader pin bushing with ball cage



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

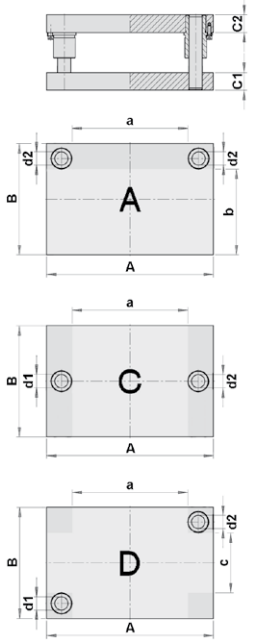
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar

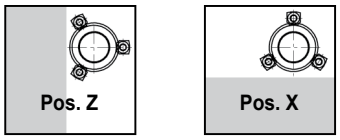


FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



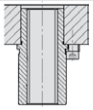
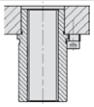
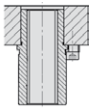
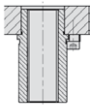
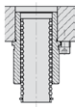
Abmessungen / Dimensions										Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin							141 131	142 132	143 133	151	152	153	Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3		a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c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

Säulengest. a. Stahl, 2 Platten, 2 Säulen, Typ A-C-D, M-Line

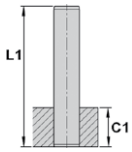
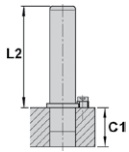
Steel die sets, 2 plates, 2 posts, types A-C-D, M-Line

SÄULENGESTELLE / DIE SETS

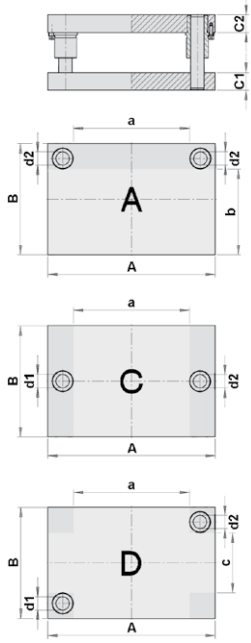
Buchsentyp / Type of bushing

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 press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps

Pos. Z

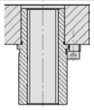
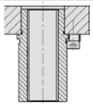
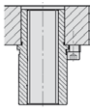
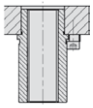
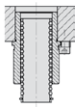
Pos. X

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

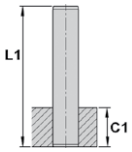
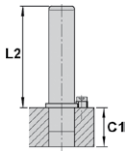
Säulengest. a. Stahl, 2 Platten, 2 Säulen, Typ A-C-D, M-Line

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

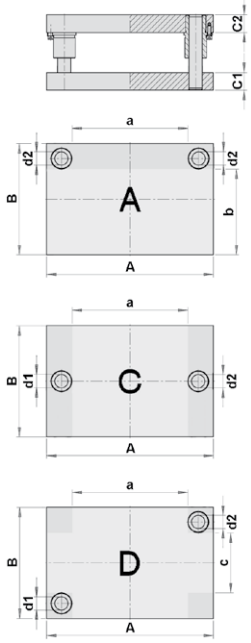
Buchsentyp / Type of bushing

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

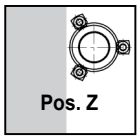
Säulentyp / Type of leader pin

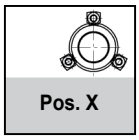
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps


Pos. Z


Pos. X

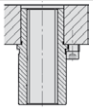
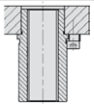
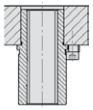
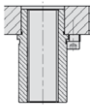
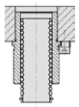
Abmessungen / Dimensions										Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin							141 131	142 132	143 133	151	152	153	
		C1	C2	C3	d1/d2	L1	L2	L3		a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c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

Säulengest. a. Stahl, 2 Platten, 2 Säulen, Typ A-C-D, M-Line

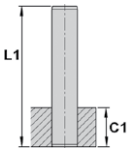
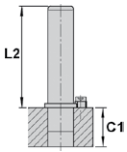
Steel die sets, 2 plates, 2 posts, types A-C-D, M-Line

SÄULENGESTELLE / DIE SETS

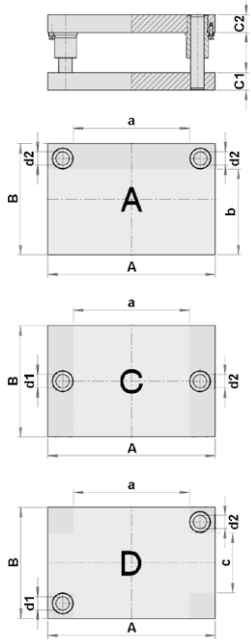
Buchsentyp / Type of bushing

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

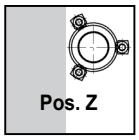
Säulentyp / Type of leader pin

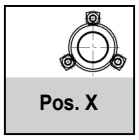
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps


Pos. Z

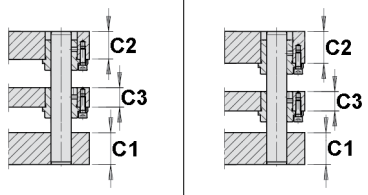

Pos. X

Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						141 131	142 132	143 133	151	152	153	
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
391	600 X 400	58	48	–	48/50	224	180	–				406 X 400	303 X 600	206 X 600	406 X 400	303 X 600	206 X 600	205,0
392		58	58	–		250	180	–										224,0
393		68	58	–		250	180	–										242,0
394	600 X 500	58	48	–	48/50	224	160	–				406 X 500	403 X 600	306 X 600	406 X 500	403 X 600	306 X 600	254,0
395		58	58	–		250	180	–										278,0
396		68	58	–		250	180	–										302,0
397	600 X 600	58	48	–	48/50	224	160	–				406 X 600	503 X 600	406 X 600	406 X 600	503 X 600	406 X 600	305,0
398		58	58	–		234	180	–										333,0
399		68	58	–		250	180	–										361,0
400	700 X 350	58	48	–	48/50	224	160	–				506 X 350	253 X 700	156 X 700	506 X 350	253 X 700	156 X 700	209,0
401		58	58	–		250	180	–										228,0
402		68	58	–		250	180	–										247,0
403	700 X 400	58	48	–	48/50	224	160	–				506 X 400	303 X 700	206 X 700	506 X 400	303 X 700	206 X 700	238,0
404		58	58	–		250	180	–										260,0
405		68	58	–		250	180	–										282,0
406	700 X 500	58	48	–	48/50	224	160	–				506 X 500	403 X 700	306 X 700	506 X 500	403 X 700	306 X 700	296,0
407		58	58	–		250	180	–										324,0
408		68	58	–		250	180	–										351,0
409	700 X 600	58	48	–	48/50	224	160	–				506 X 600	503 X 700	406 X 700	506 X 600	503 X 700	406 X 700	354,0
410		58	58	–		250	180	–										388,0
411		68	58	–		250	180	–										420,0
412	800 X 400	58	48	–	48/50	224	160	–				606 X 400	303 X 800	206 X 800	606 X 400	303 X 800	206 X 800	271,0
413		58	58	–		250	180	–										296,0
414		68	58	–		250	180	–										321,0
415	800 X 500	58	48	–	48/50	224	160	–				606 X 500	403 X 800	306 X 800	606 X 500	403 X 800	306 X 800	338,0
416		58	58	–		250	180	–										369,0
417		68	58	–		250	180	–										400,0
418	800 X 600	58	48	–	48/50	224	160	–				606 X 600	503 X 800	406 X 800	606 X 600	503 X 800	406 X 800	404,0
419		58	58	–		250	180	–										442,0
420		68	58	–		250	180	–										480,0

Säulengest. a. Stahl, 3 Platten, 2 Säulen, Typ A-C-D, M-Line

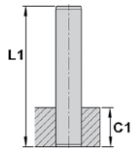
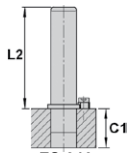
Steel die sets, 3 plates, 2 posts, types A-C-D, M-Line

Buchsentyp / Type of bushing

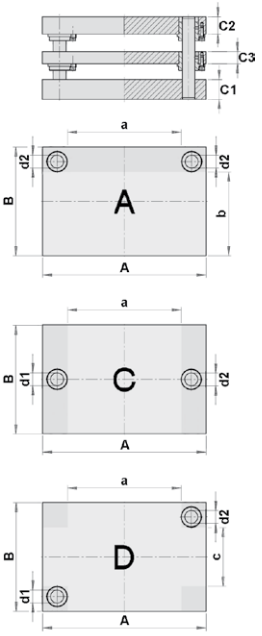


Stahlbuchse, RM-beschichtet Leader pin bushing, RM plated	
C2: FS 340 RM C3: FS 330 RM	C2: FS 350 RM C3: FS 330 RM
182	183
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 351 C3: FS 331	C2: FS 355 C3: FS 331
172	173
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 358 + FS 325 C3: FS 357 + FS 325	C2: FS 353 + FS 325 C3: FS 357 + FS 325
192	193

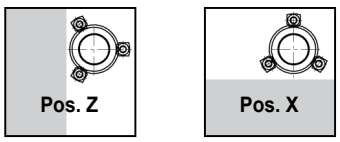
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps

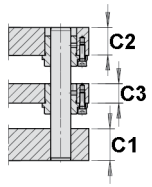


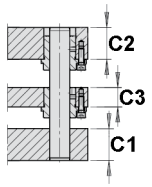
Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						182 172	183 173		192		193	
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
301	125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

Säulengest. a. Stahl, 3 Platten, 2 Säulen, Typ A-C-D, M-Line

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

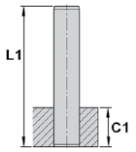
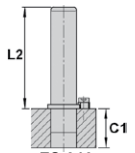
Buchsentyp / Type of bushing



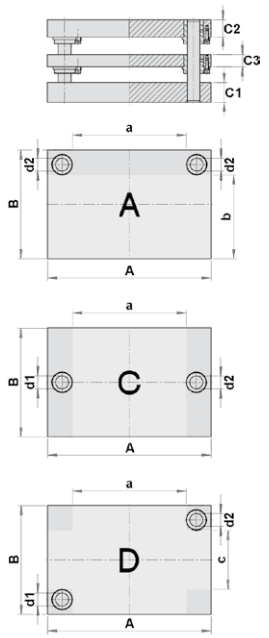


Stahlbuchse, RM-beschichtet Leader pin bushing, RM plated	
C2: FS 340 RM C3: FS 330 RM	C2: FS 350 RM C3: FS 330 RM
182	183
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 351 C3: FS 331	C2: FS 355 C3: FS 331
172	173
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 358 + FS 325 C3: FS 357 + FS 325	C2: FS 353 + FS 325 C3: FS 357 + FS 325
192	193

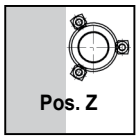
Säulentyp / Type of leader pin

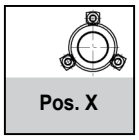
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position holding clamps



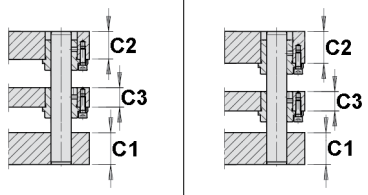


Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						182 172	183 173		192		193	
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
331	300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

Säulengest. a. Stahl, 3 Platten, 2 Säulen, Typ A-C-D, M-Line

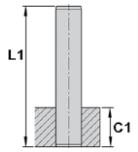
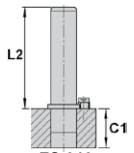
Steel die sets, 3 plates, 2 posts, types A-C-D, M-Line

Buchsentyp / Type of bushing

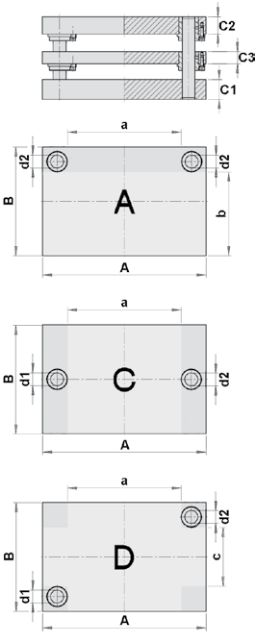


Stahlbuchse, RM-beschichtet Leader pin bushing, RM plated	
C2: FS 340 RM C3: FS 330 RM	C2: FS 350 RM C3: FS 330 RM
182	183
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 351 C3: FS 331	C2: FS 355 C3: FS 331
172	173
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 358 + FS 325 C3: FS 357 + FS 325	C2: FS 353 + FS 325 C3: FS 357 + FS 325
192	193

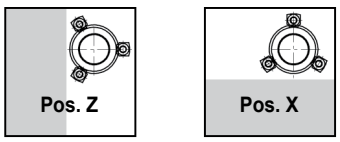
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps

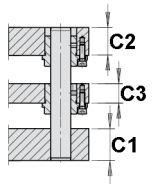


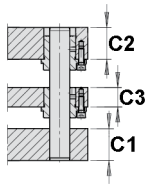
Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						182 172	183 173		192		193	
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
361	400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

Säulengest. a. Stahl, 3 Platten, 2 Säulen, Typ A-C-D, M-Line

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

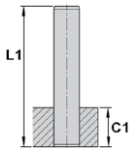
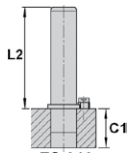
Buchsentyp / Type of bushing



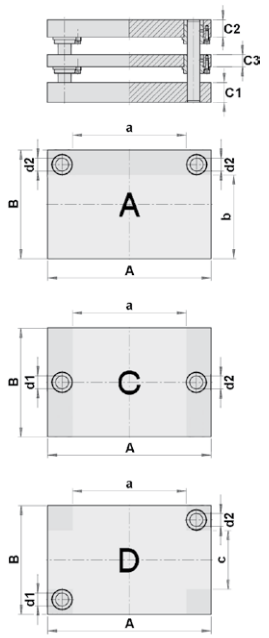


Stahlbuchse, RM-beschichtet Leader pin bushing, RM plated	
C2: FS 340 RM C3: FS 330 RM	C2: FS 350 RM C3: FS 330 RM
182	183
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 351 C3: FS 331	C2: FS 355 C3: FS 331
172	173
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 358 + FS 325 C3: FS 357 + FS 325	C2: FS 353 + FS 325 C3: FS 357 + FS 325
192	193

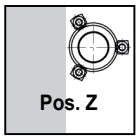
Säulentyp / Type of leader pin

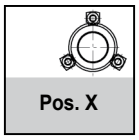
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



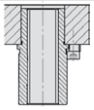
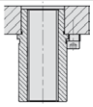
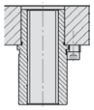
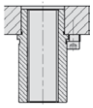
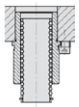


Abmessungen / Dimensions									Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						182 172	183 173		192		193	Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
391	600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

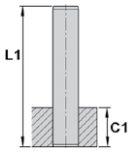
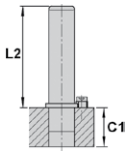
Säulengest. a. Stahl, 2 Platten, 4 Säulen, Typ Q, M-Line

Steel die sets, 2 plates, 4 posts, type Q, M-Line

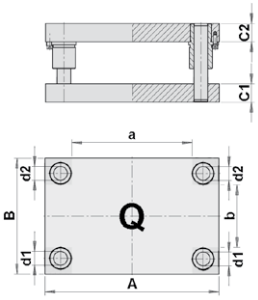
Buchsentyp / Type of bushing

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

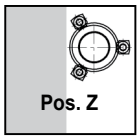
Säulentyp / Type of leader pin

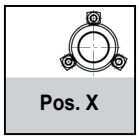
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps


Pos. Z


Pos. X

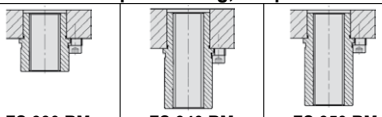
Abmessungen / Dimensions										Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin							141 131	142 132	143 133	151	152	153	
		C1	C2	C3	d1/d2	L1	L2	L3		a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c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

Säulengest. a. Stahl, 2 Platten, 4 Säulen, Typ Q, M-Line

Steel die sets, 2 plates, 4 posts, type Q, M-Line

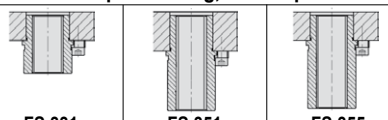
Buchsentyp / Type of bushing

Stahlbuchse, RM-beschichtet
Leader pin bushing, RM plated



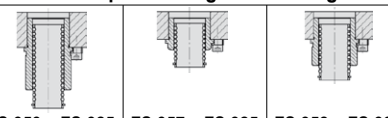
FS 330 RM	FS 340 RM	FS 350 RM
141	142	143

Stahlbuchse mit Bronzeplattierung
Leader pin bushing, bronze plated



FS 331	FS 351	FS 355
131	132	133

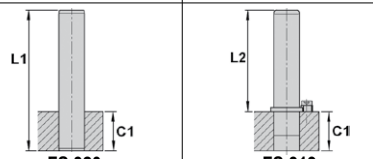
Stahlbuchse mit Ms-Käfig
Leader pin bushing with ball cage



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

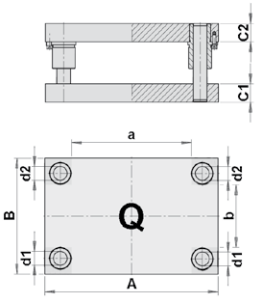
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar

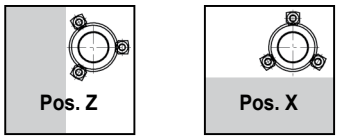


FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps

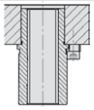
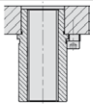
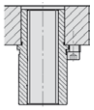
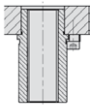
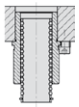


Abmessungen / Dimensions										Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin							141 131 142 132 143 133			151 152 153			
		C1	C2	C3	d1/d2	L1	L2	L3		a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X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

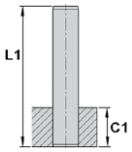
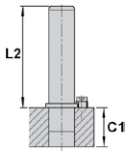
Säulengest. a. Stahl, 2 Platten, 4 Säulen, Typ Q, M-Line

Steel die sets, 2 plates, 4 posts, type Q, M-Line

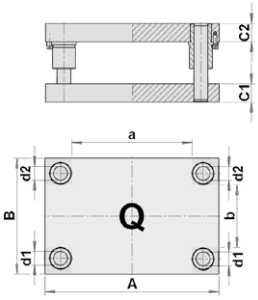
Buchsentyp / Type of bushing

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

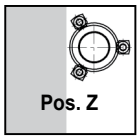
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

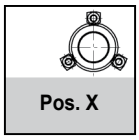
Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



Pos. Z



Pos. X

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

Säulengest. a. Stahl, 2 Platten, 4 Säulen, Typ Q, M-Line

Steel die sets, 2 plates, 4 posts, type Q, M-Line

Buchsentyp / Type of bushing

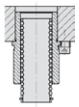
Stahlbuchse, RM-beschichtet
Leader pin bushing, RM plated

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

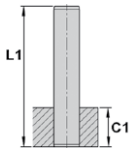
Stahlbuchse mit Ms-Käfig
Leader pin bushing with ball cage



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

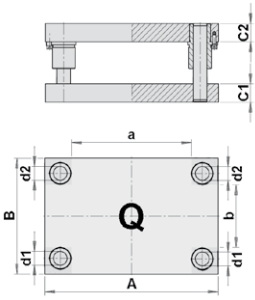
Säulentyp / Type of leader pin

eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar

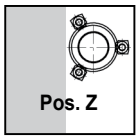


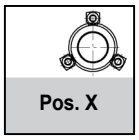
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



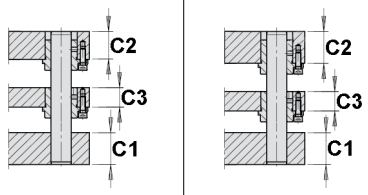


Abmessungen / Dimensions									Arbeitsflächen / Working area									Gewicht / Weight [kg]
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						141 131	142 132	143 133	151	152	153	
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X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

Säulengest. a. Stahl, 3 Platten, 4 Säulen, Typ Q, M-Line

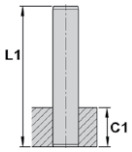
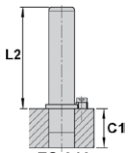
Steel die sets, 3 plates, 4 posts, type Q, M-Line

Buchsentyp / Type of bushing

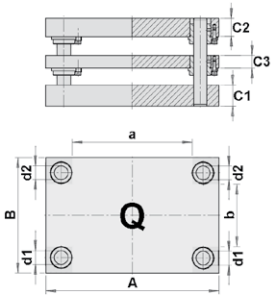


Stahlbuchse, RM-beschichtet Leader pin bushing, RM plated	
C2: FS 340 RM C3: FS 330 RM	C2: FS 350 RM C3: FS 330 RM
182	183
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 351 C3: FS 331	C2: FS 355 C3: FS 331
172	173
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 358 + FS 325 C3: FS 357 + FS 325	C2: FS 353 + FS 325 C3: FS 357 + FS 325
192	193

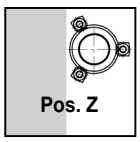
Säulentyp / Type of leader pin

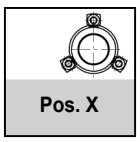
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



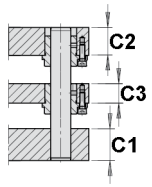


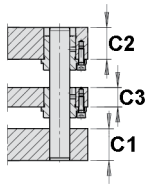
Abmessungen / Dimensions									Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						182 172	183 173		192	193		Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
301	125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

Säulengest. a. Stahl, 3 Platten, 4 Säulen, Typ Q, M-Line

Steel die sets, 3 plates, 4 posts, type Q, M-Line

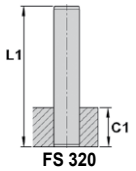
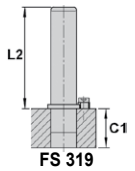
Buchsentyp / Type of bushing



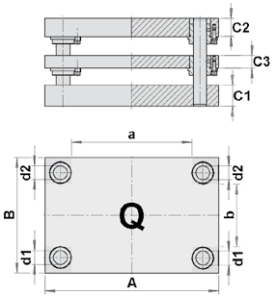


Stahlbuchse, RM-beschichtet Leader pin bushing, RM plated	
C2: FS 340 RM C3: FS 330 RM	C2: FS 350 RM C3: FS 330 RM
182	183
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 351 C3: FS 331	C2: FS 355 C3: FS 331
172	173
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 358 + FS 325 C3: FS 357 + FS 325	C2: FS 353 + FS 325 C3: FS 357 + FS 325
192	193

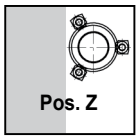
Säulentyp / Type of leader pin

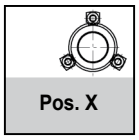
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



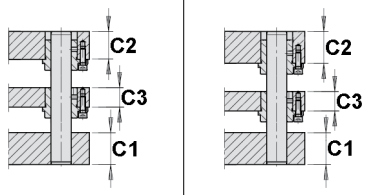


Abmessungen / Dimensions									Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						182 172	183 173		192	193		Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
331	300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

Säulengest. a. Stahl, 3 Platten, 4 Säulen, Typ Q, M-Line

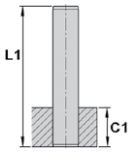
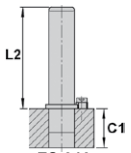
Steel die sets, 3 plates, 4 posts, type Q, M-Line

Buchsentyp / Type of bushing

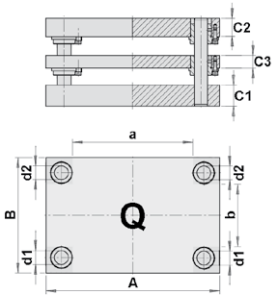


Stahlbuchse, RM-beschichtet Leader pin bushing, RM plated	
C2: FS 340 RM C3: FS 330 RM	C2: FS 350 RM C3: FS 330 RM
182	183
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 351 C3: FS 331	C2: FS 355 C3: FS 331
172	173
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 358 + FS 325 C3: FS 357 + FS 325	C2: FS 353 + FS 325 C3: FS 357 + FS 325
192	193

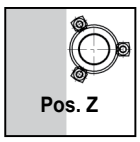
Säulentyp / Type of leader pin

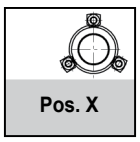
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps



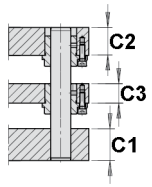


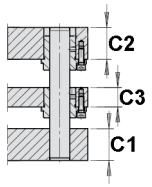
Abmessungen / Dimensions									Arbeitsflächen / Working area									
Größe / Size	A X B	Platten-stärke Plate thickness			Ø	Säulen-länge Length of leader pin						182 172	183 173		192	193		Gewicht / Weight [kg]
		C1	C2	C3	d1/d2	L1	L2	L3	a X B	b X A	c X A	a X B	b X A	c X A	a X B	b X A	c X A	
361	400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

Säulengest. a. Stahl, 3 Platten, 4 Säulen, Typ Q, M-Line

Steel die sets, 3 plates, 4 posts, type Q, M-Line

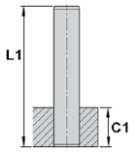
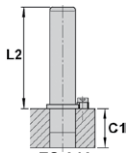
Buchsentyp / Type of bushing



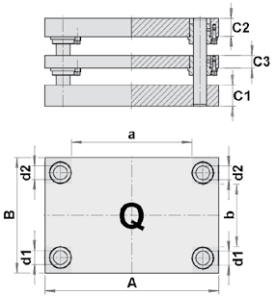


Stahlbuchse, RM-beschichtet Leader pin bushing, RM plated	
C2: FS 340 RM C3: FS 330 RM	C2: FS 350 RM C3: FS 330 RM
182	183
Stahlbuchse mit Bronzeplattierung Leader pin bushing, bronze plated	
C2: FS 351 C3: FS 331	C2: FS 355 C3: FS 331
172	173
Stahlbuchse mit Ms-Käfig Leader pin bushing with ball cage	
C2: FS 358 + FS 325 C3: FS 357 + FS 325	C2: FS 353 + FS 325 C3: FS 357 + FS 325
192	193

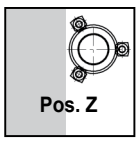
Säulentyp / Type of leader pin

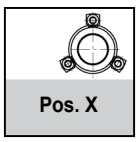
eingepresst press-fitted	Schnellwechsel-säule mit Bund Leader pin, with collar
	
FS 320	FS 319
P	R

Gestelltyp / Type of die set



Position der Haltestücke / Position of holding clamps





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

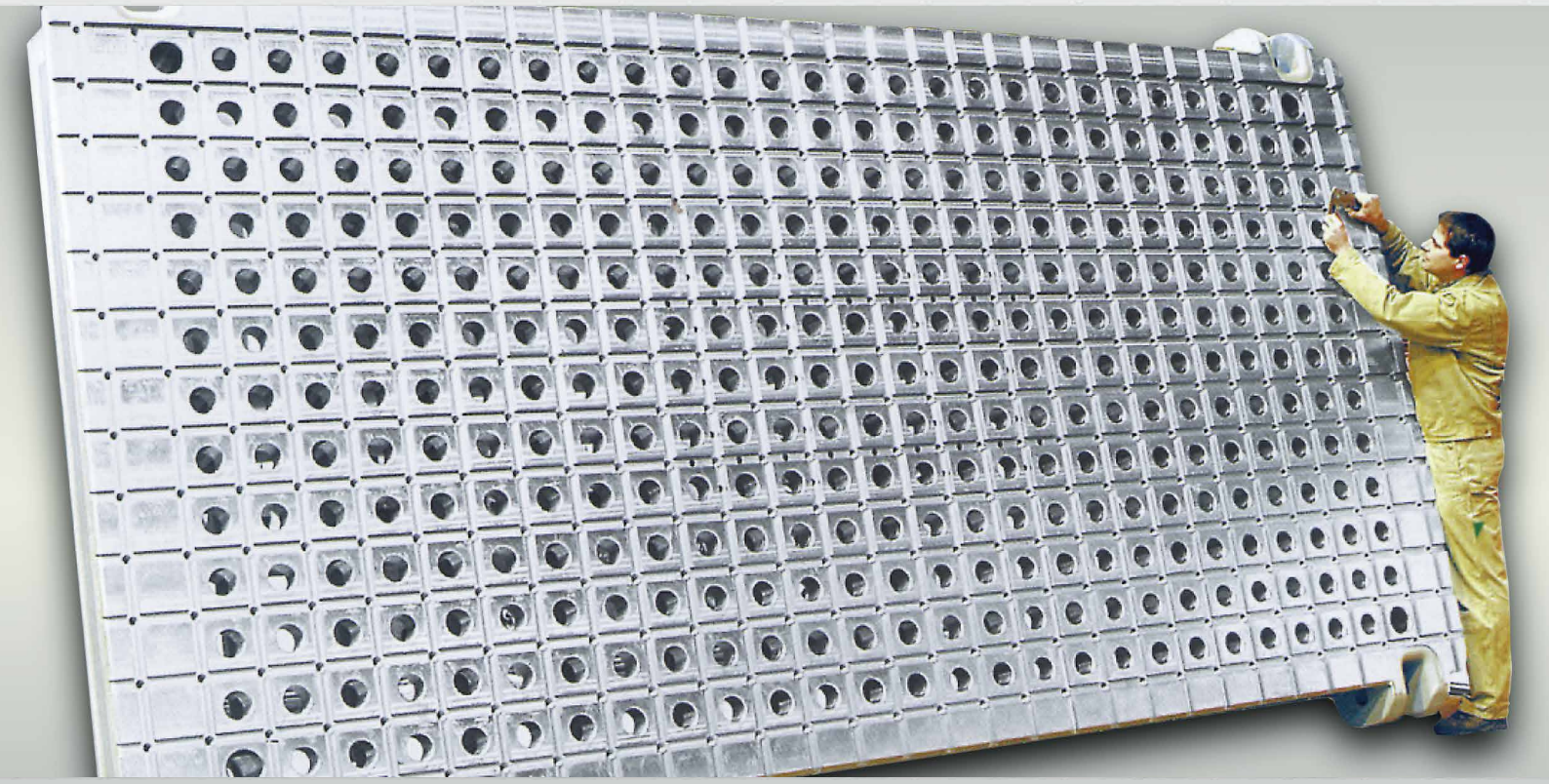
Notizen

Notes

zertifiziert ISO 9001 for you Cert

MSPN GMBH

Märkische Stanz-Partner



[stanznormalien]

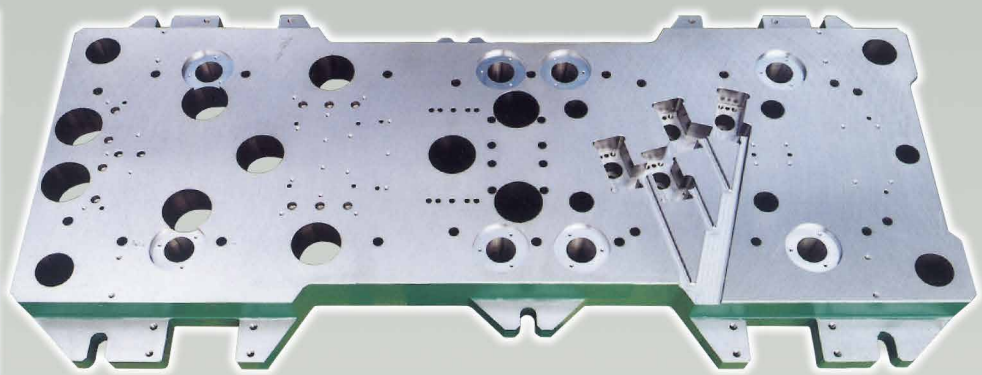
Großstahlplatten und Stahl-Schweiß-
Konstruktionen mit Sonderbearbeitungen

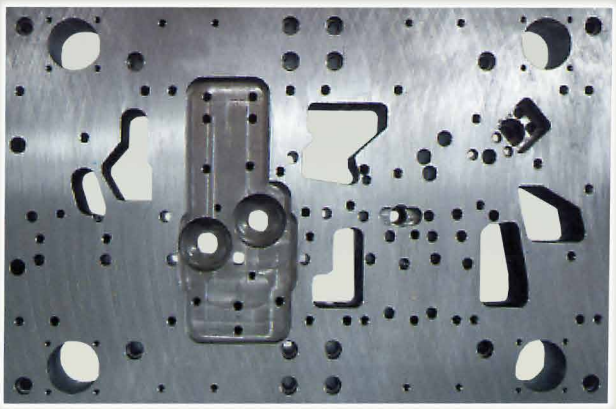
[standarddiecomponents]

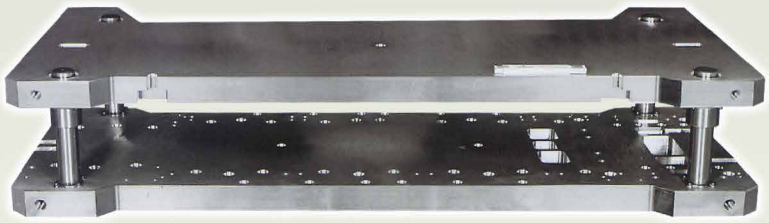
XXL - Steel plates and welded units
with additional work / secondary operation

Großstahlplatten und Stahl-Schweiß-Konstruktionen

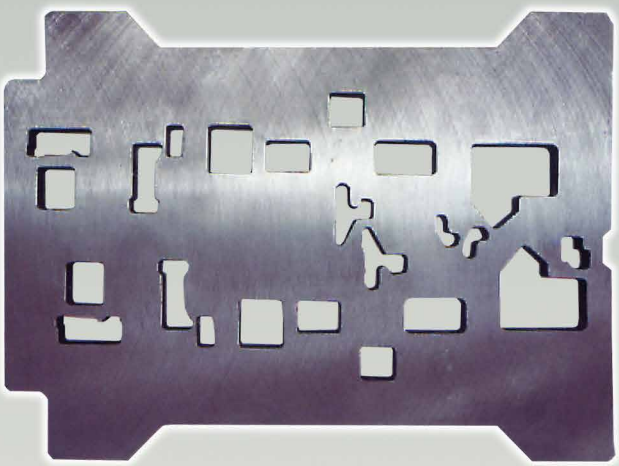
XXL - Steel plates and welded units

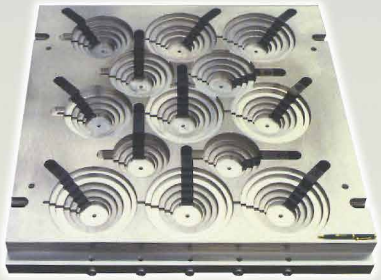






CNC - Brennschneiden CNC - flame cutting	Materiallager ST 52-3, Blechdicken 10 – 600 mm Stock ST 52-3, sheet thickness 10 – 600 mm
Glühen Annealing	Abmessungen 6.000 x 3.000 x 2.000 mm, bis 25 t Stückgewicht Dimensions 6.000 x 3.000 x 2.000 mm, up to 25 t unit weight
Stahlkies strahlen Steel shot blasting	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
Richten Flattening	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
Farbgebung - Grundierung Coloring - priming	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
CNC - Diskusschleifen CNC - rotary grinding	Verfahrweg Travelling distance 4.000 x 1.250 x 300 mm
CNC - Feinschleifen CNC - finish grinding	Verfahrweg Travelling distance 3.000 x 1.600 x 600 mm





CNC - Lehrenbohren CNC - jig boring	Verfahrweg Travelling distance	3.000 x 1.600 x 600 mm
CNC - Portalfräsen CNC - portal milling	Verfahrweg Travelling distance	7.000 x 3.000 x 1.400 mm
CNC - Fräsen und Bohren CNC - milling and -drilling	Verfahrweg Travelling distance	4.900 x 2.400 x 800 mm
CNC - Portalmessen CNC - portal measuring	Verfahrweg Travelling distance	3.000 x 1.600 x 800 mm
CNC - Tieflochbohren CNC - gun drilling	Durchmesser 30 – 120 mm / Diameter 30 – 120 mm bis 1.500 mm als Sacklochbohrung / Blind holes up to 1.500 mm deep 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 manufacuring process are drawings supplied by the customer, printed or as DXF-, DWG-, IGES-, VDA- or Catia - CAD - data files.

zertifiziert ISO 9001 for you Cert

MSPN GMBH

Märkische Stanz-Partner

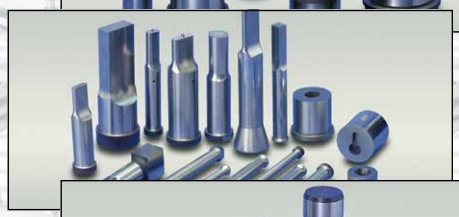
[lieferprogramm] [productrange]

[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

[nitrocylGasdruckfedern]
umfangreiches Programm für unterschiedliche Anwendungen

[nitrocylGasSprings]
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

[misatiGreifersysteme]
Umfangreiches Programm an Misati Spann- und Transferelementen, u.a. für Transferpressen

[misatiFasteningClamps]
Extenisve line of Misati holding / clamping components for transfer-press - automation

Märkische Stanz-Partner Normalien GmbH
Jüngerstrasse 17 • D-58515 Lüdenscheid
Tel.: +49 (0) 23 51 / 6 61 07-0 • Fax: +49 (0) 23 51 / 6 61 07-77
e-mail: mail@maerkische-stanz-partner.de • www.maerkische-stanz-partner.de

Es gelten unsere allgemeinen Verkaufs- und Lieferbedingungen, die wir Ihnen auf Nachfrage gerne zusenden.
Our general terms and conditions, which we gladly provide / send on your request, apply at all times.

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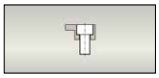
MSPN GMBH

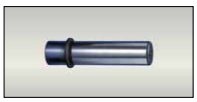
Märkische Stanz-Partner

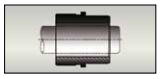
[führungssysteme]

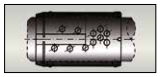
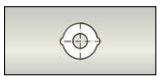
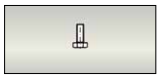
[guidingsystems]

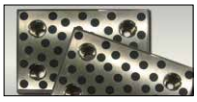
[FS]

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

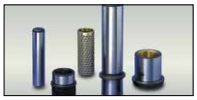
	**Führungssäulen**	**Leader pins**	**Best.-Nr. Order no.**	**Seite Page**
	Führungssäulen für Großwerkzeuge nach DIN 9833	Leader pins for large dies, DIN 9833	FS 410 FS 412	FS.10
	Führungssäulen, zylindrisch, zum Einpressen, nach DIN 9825	Leader pins, cylindrical, for press fitting, DIN 9825	FS 420	FS.8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

	Führungsbuchsen	Leader pin bushings	Best.-Nr. Order no.	Seite Page
	Führungsbuchsen mit Bund, Bronze beschichtet, kurzer Bund	Leader pin bushings, with collar, bronze plated, short headed	FS 631 FS 632	FS.14 FS.15
	Führungsbuchsen mit Bund, Bronze beschichtet, langer Bund	Leader pin bushings, with collar, bronze plated, long headed	FS 641, FS 651 FS 655	FS.14 FS.15
	Führungsbuchsen mit Bund, Gleitschicht Sintermetall, kurzer Bund	Leader pin bushings, with collar, sinter-metal plated, short headed	FS 731 FS 732	FS.12 FS.13
	Führungsbuchsen mit Bund, Gleitschicht Sintermetall, langer Bund	Leader pin bushings, with collar, sinter-metal plated, long headed	FS 741, FS 751 FS 755	FS.12 FS.13
	Führungsbuchsen mit Bund, Kugelführung	Leader pin bushings, with collar, for ball bearing application	FS 457, FS 458 FS 453	FS.16
	Führungsbuchsen mit Bund, Stahlführung, kurzer Bund RM-beschichtet	Leader pin bushings, with collar, steel, short headed RM-coated	FS 430 RM FS 439 RM	FS.11
	Führungsbuchsen mit Bund, Stahlführung, langer Bund RM-beschichtet	Leader pin bushings, with collar, steel, long headed RM-coated	FS 440 RM FS 450 RM	FS.11
	Führungsbuchsen mit Festschmierstoff nach DIN 9834 / ISO 9448	Leader pin bushings with self lubricating graphite plugs, DIN 9834 / ISO 9448	FS 460	FS.22

	Kugelkäfige und Befestigungselemente	Ball cages and mounting elements	Best.-Nr. Order no.	Seite Page
	Abgehängte Kugelkäfige	Ball cages with circlip	FS 424	FS.18 FS.19
	Befestigungselemente RA	Mounting elements RA	FS 424 / RA	FS.21
	Befestigungselemente SI	Mounting elements SI	FS 424 / SI	FS.20
	Befestigungselemente TR	Mounting elements TR	FS 424 / TR	FS.20
	Befestigungselemente VI	Mounting elements VI	FS 424 / VI	FS.21
	Kugelkäfige aus Messing	Ball cages, brass	FS 425	FS.17



	Gleitplatten	Wear plates	Best.-Nr. Order no.	Seite Page
	Gleitplatten VDI 3357 Bronze mit Festschmierstoff, 12 mm dick	Wear plates VDI 3357 with self lubricating graphite plugs, 12 mm thick	FS 502	FS.27
	Gleitplatten VDI 3357 Bronze mit Festschmierstoff, 20 mm dick	Wear plates VDI 3357 with self lubricating graphite plugs, 20 mm thick	FS 500	FS.26



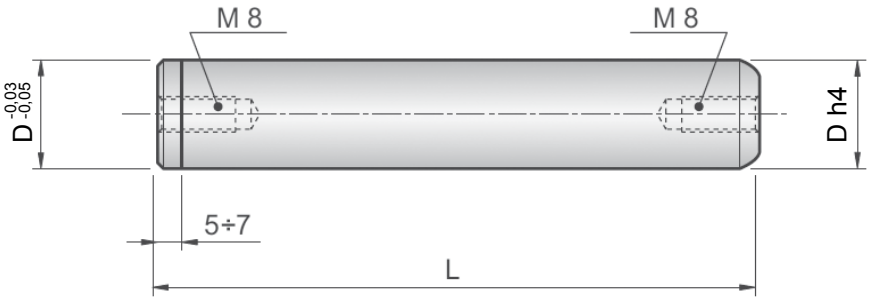
	Zubehör Bereich Führungssysteme	Elements product line „guiding systems“	Best.-Nr. Order no.	Seite Page
	Haltescheiben für Bundsäulen-befestigung	Holding disks	FS 958	FS.25
	Haltestücke für Führungsbuchsen mit Festschmierstoff n.DIN 9834 / ISO 9448	Holding clamps for bronze leader pin bushings with selflubricating graphite plugs, DIN 9834 / ISO 9448	FS 460 HS	FS.23
	Haltestücke für Säulen- und Buchsenbefestigung	Holding clamps for holding leader pins and -bushings	FS 955	FS.24

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

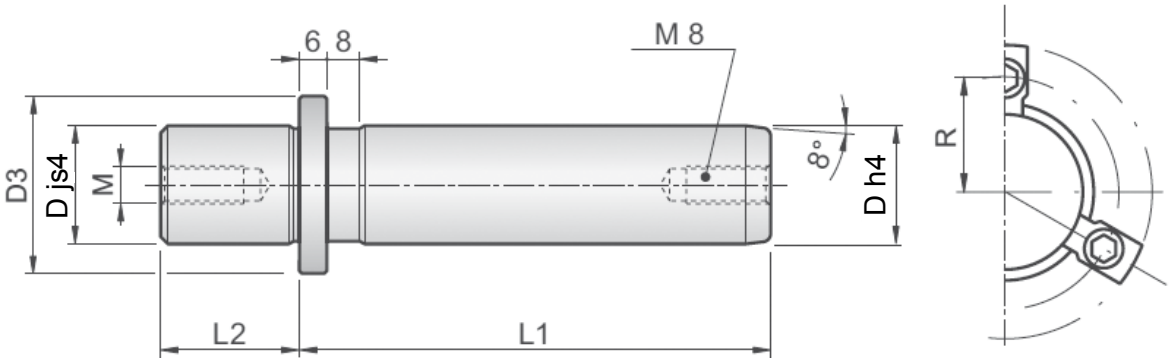
Mat.: 1.7131 / 61 - 63 HRC

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

Mat.: 1.7131 / 61 - 63 HRC

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

FS 319 / 25 x 160



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							●	●	●	●	●	●	●

mit langem Bund/long-headed style

FS 340 … RM
FS 350 … RM

INFO FS.29

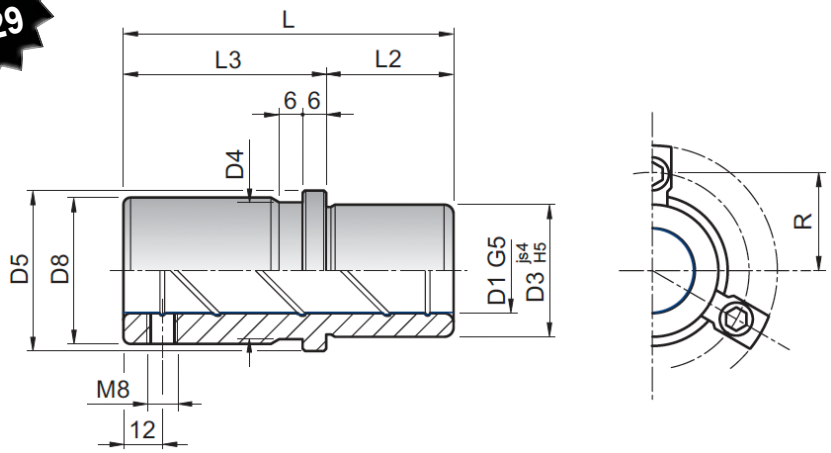
Mat.: 1.7131 / 61 - 63 HRC
RM-beschichtet (selbstschmierend)

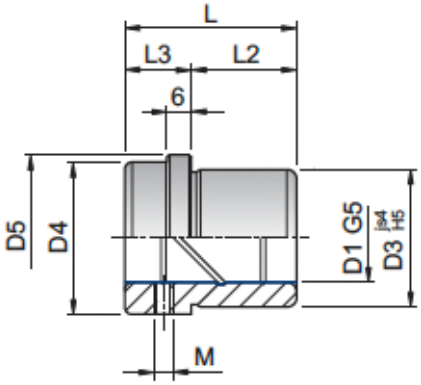
Lieferumfang:
- 3 Halteklammern mit Schrauben

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 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

Führungsbuchsen mit Bund, Stahl/Bronze, M-Line

Leader pin bushings with collar, steel/bronze, M-Line

mit langem Bund/long-headed style

FS 351
FS 355

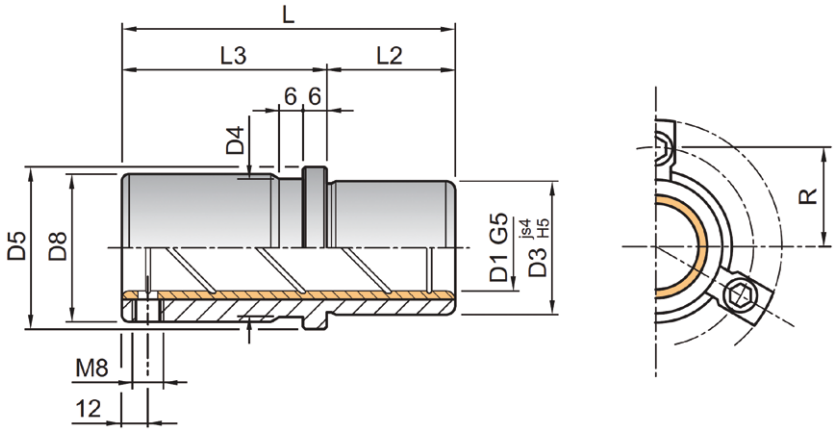
Mat.: 1.7131 + Bronze
Härte: 61 - 63 HRC

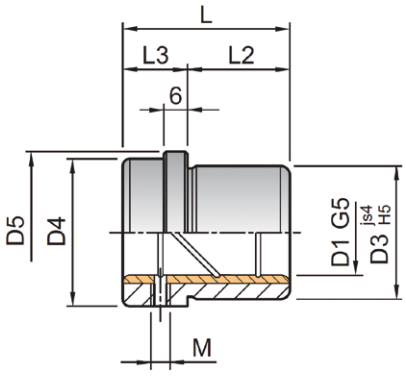
Lieferumfang:
- 3 Halteklammern mit Schrauben

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 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

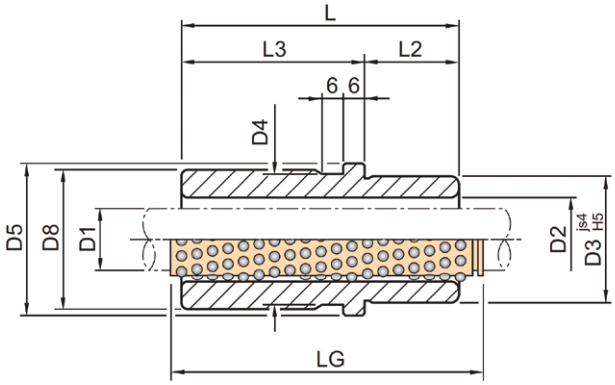
Mat.: 1.7131 / 61 - 63 HRC

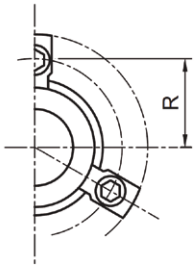
Lieferumfang:
- 3 Halteklammern mit Schrauben

Mat.: 1.7131 / 61 - 63 HRC

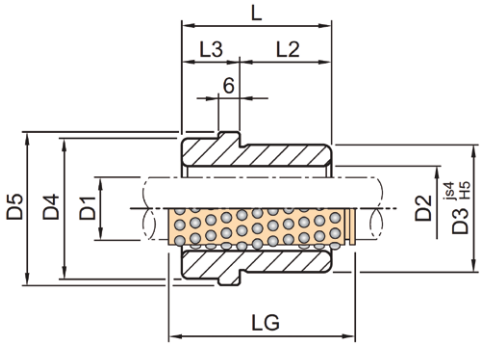
Included:
- 3 holding clamps with screws

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

[FS]

FS 325

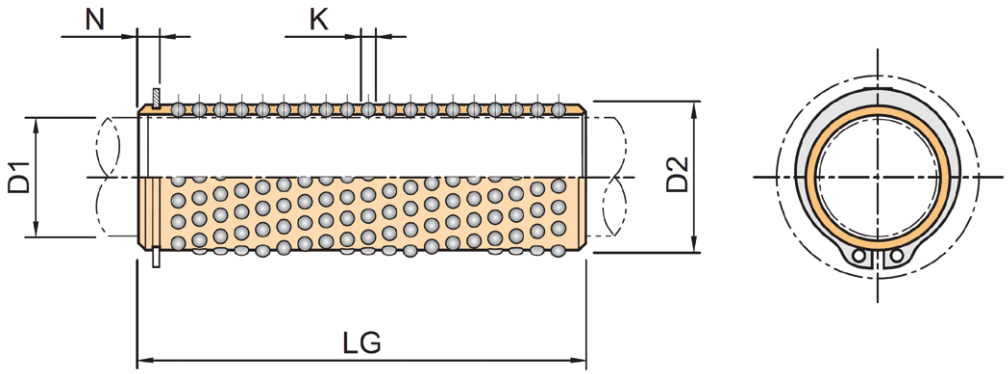
Mat.: Messing
Stahlkugeln: Güteklasse AAA

Sicherungsring im Lieferumfang enthalten.

Mat.: Brass
Steel balls, grade AAA

Safety ring included

FS 325 / 25 x 71



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 395 / A - C

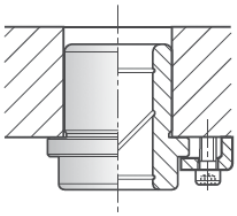
FS 395 / A für Ø 19-20, 24-25
FS 395 / B für Ø 19-20, 24-25
FS 395 / C für Ø 30-32, 38-40, 48-50, 60-63, 80

Haltestücke werden mit Schrauben geliefert.

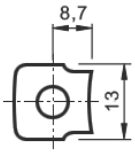
FS 395 / A for Ø 19-20, 24-25
FS 395 / B for Ø 19-20, 24-25
FS 395 / C for Ø 30-32, 38-40, 48-50, 60-63, 80

Holding clamps include screws

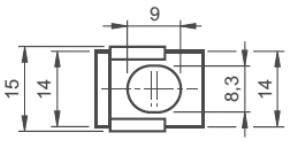
FS 395 / A



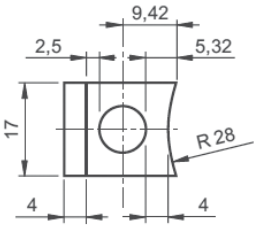
FS 395 / A

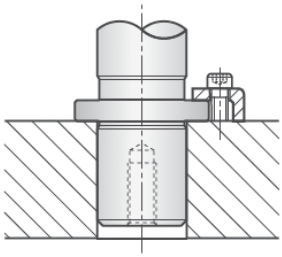


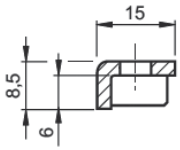
FS 395 / B

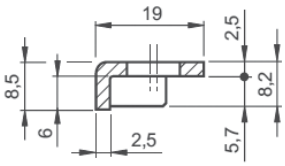


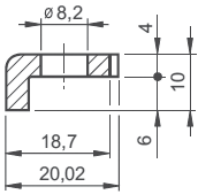
FS 395 / C









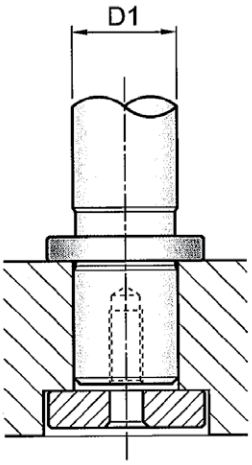


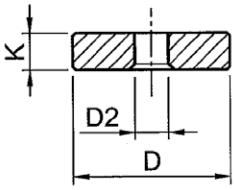
FS 398

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

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

FS 398 / 1





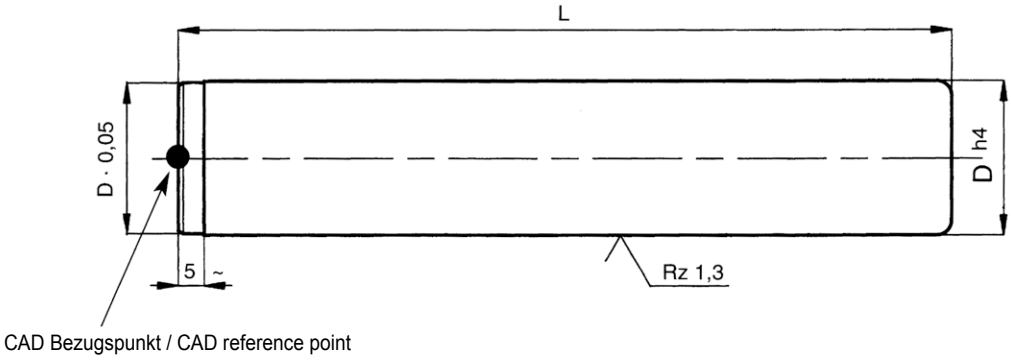
Ausführung Style	D1	D	K	D2
1	19-20	25	6	8,5
2	24-25	32	6	8,5
3	30-32	40	6	8,5
4	38-40	50	6	8,5
5	48-50	60	6	8,5
6	60-63	70	6	8,5
7	80	93	12	12,5

FS 420

Mat.: 1.5732 / 61 - 63 HRC

Mat.: 1.5732 / 61 - 63 HRC

FS 420 / 24 x 200



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

FS 419

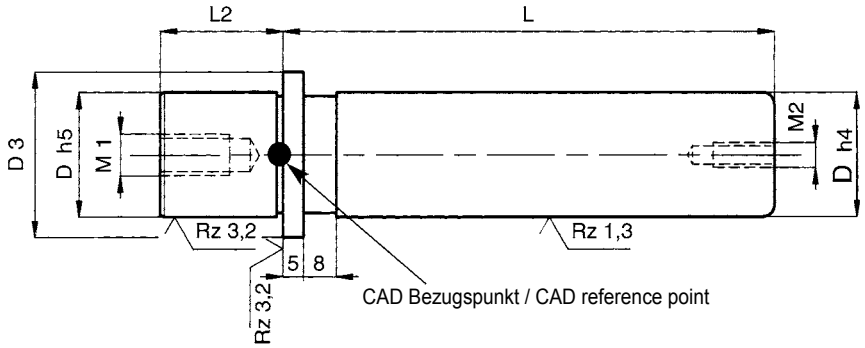
Mat.: 1.5732 / 61 - 63 HRC

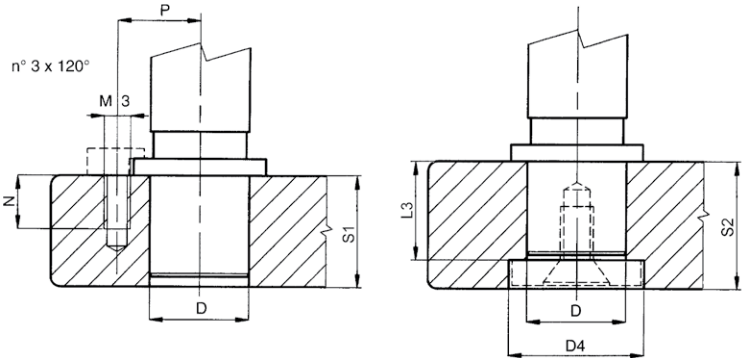
Lieferumfang:
- bei Haltestückverschraubung mit 3 Halteklammern
- bei Scheibenbefestigung mit Haltescheibe

Mat.: 1.5732 / 61 - 63 HRC

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

FS 419 / 25 x 160





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 Mounting hole
	100	110	120	130	140	150	160	170	180	200	220	240	260	280	300	320	360	400	R7
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]

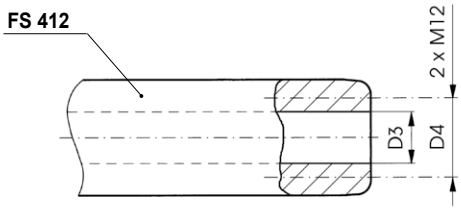
FS 410
FS 412

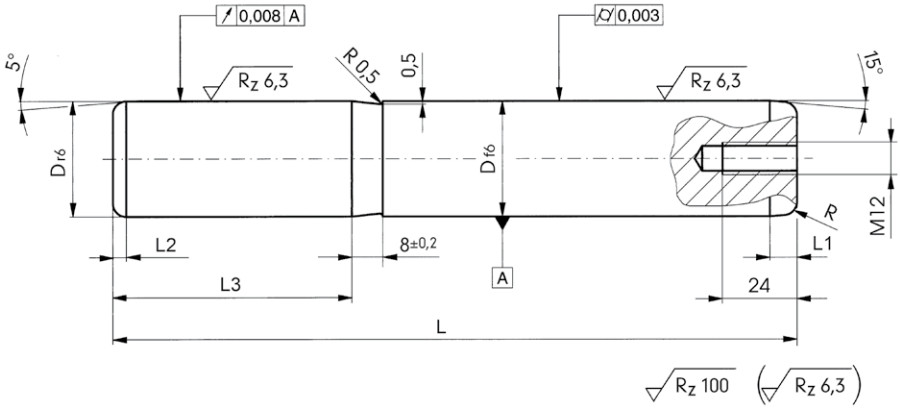
Mat.: Stahl
Oberflächenhärte: 62 - 64 HRC
Einhärtungstiefe: 1,5 + 1 mm

Mat.: steel
Surface hardness: 62 - 64 HRC
Hardening depth: 1,5 + 1 mm

FS 410 / 50 x 200

INFO FS.28





D	L														L1	L2	L3	D3	D4	R
	125	140	160	180	200	224	250	280	315	355	400	450	500	560						
25	●	●	●	●											8	4	40	–	–	2
32		●	●	●	●										8	4	45	–	–	2
40		●	●	●	●	●	●	●							8	4	56	–	–	2
50			●	●	●	●	●	●	●	●					10	4	70	–	–	2,5
63				●	●	●	●	●	●	●	●				10	4	80	–	–	2,5
80						●	●	●	●	●	●				10	4	100	40	57	3
100								●	●	●	●	●	●		10	4	125	50	72	3
125									●	●	●	●	●		12	5	140	65	90	4
160											●	●	●	●	12	5	180	95	132	4

mit langem Bund/long-headed style

FS 440 … RM
FS 450 … RM

INFO FS.29

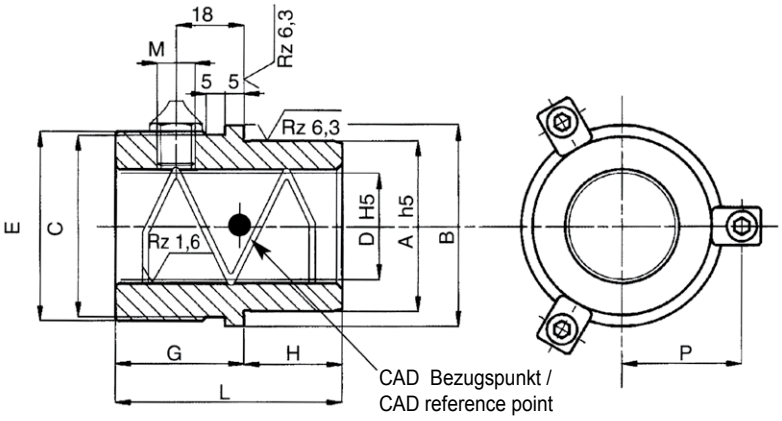
Mat.: 1.6757 / 61 - 63 HRC
RM-beschichtet (selbstschmierend)

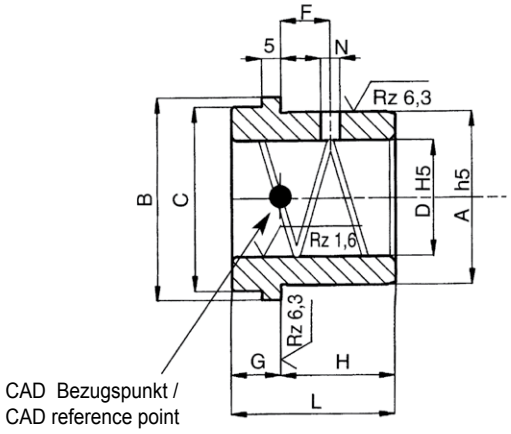
Lieferumfang:
- 3 Halteklammern mit Schrauben

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

Included:
- 3 holding clamps with screws

FS 450 / 40 x 90 / RM





mit kurzem Bund/short-headed style

FS 430 … RM
FS 439 … RM

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

[FS]

mit langem Bund/long-headed style

FS 741
FS 751
FS 755

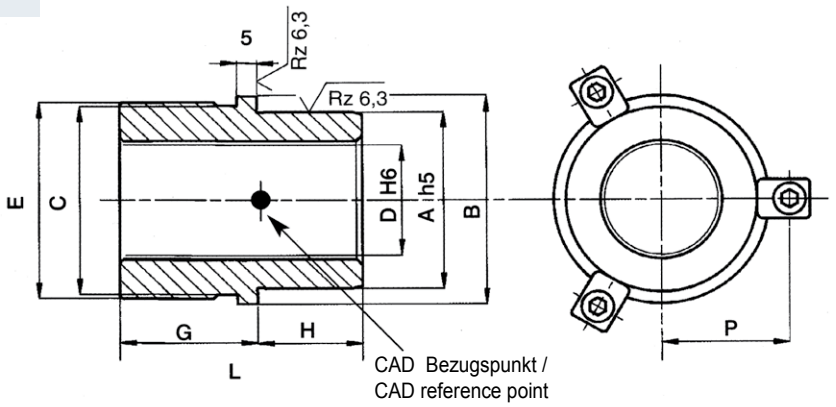
Mat.: Stahl 61 - 63 HRC
Sinter: 40 - 50 HRC

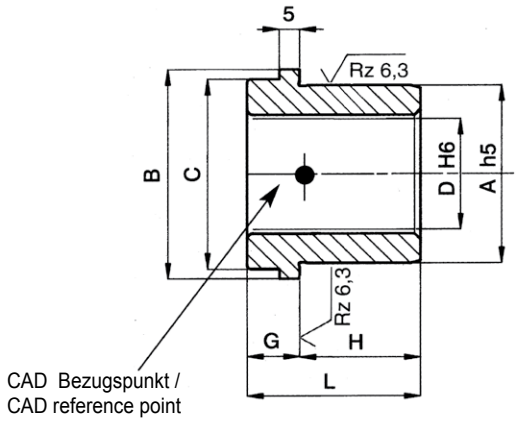
Lieferumfang:
- 3 Halteklammern mit Schrauben

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

Included:
- 3 holding clamps with screws

FS 751 / 30 x 90





mit kurzem Bund/short-headed style

FS 731
FS 732

D	A	B	C	Artikelnummer Article number	E	G	H	L	P	Aufnahmebohrung Mounting hole 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

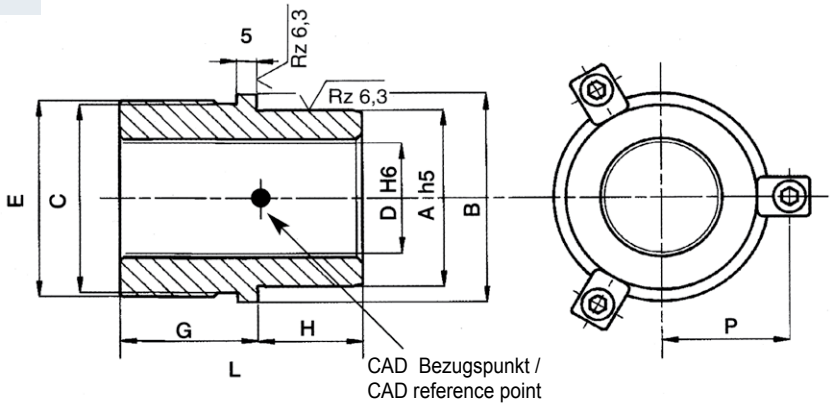
Mat.: Stahl 61 - 63 HRC
Sinter: 40 - 50 HRC

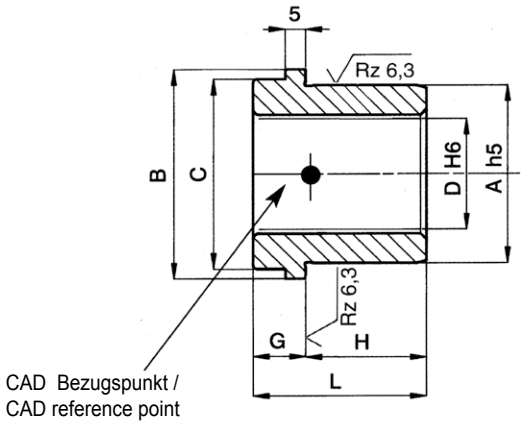
Lieferumfang:
- 3 Halteklammern mit Schrauben

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 Article number	E	G	H	L	P	Aufnahmebohrung Mounting hole H6
63	81	92	87	**FS 731**	–	13	61	**74**	51	$81^{+0,022}$
63	81	92	87	**FS 732**	–	13	77	**90**	51	$81^{+0,022}$
63	81	92	87	**FS 741**	89	42	48	**90**	51	$81^{+0,022}$
63	81	92	87	**FS 751**	89	63	67	**130**	51	$81^{+0,022}$
63	81	92	87	**FS 755**	89	82	48	**130**	51	$81^{+0,022}$
80	100	111	106	**FS 731**	–	13	78	**91**	60,5	$100^{+0,022}$
80	100	111	106	**FS 741**	108	52	48	**100**	60,5	$100^{+0,022}$
80	100	111	106	**FS 751**	108	73	77	**150**	60,5	$100^{+0,022}$
80	100	111	106	**FS 755**	108	102	48	**150**	60,5	$100^{+0,022}$

[FS]

mit langem Bund/long-headed style

FS 641
FS 651
FS 655

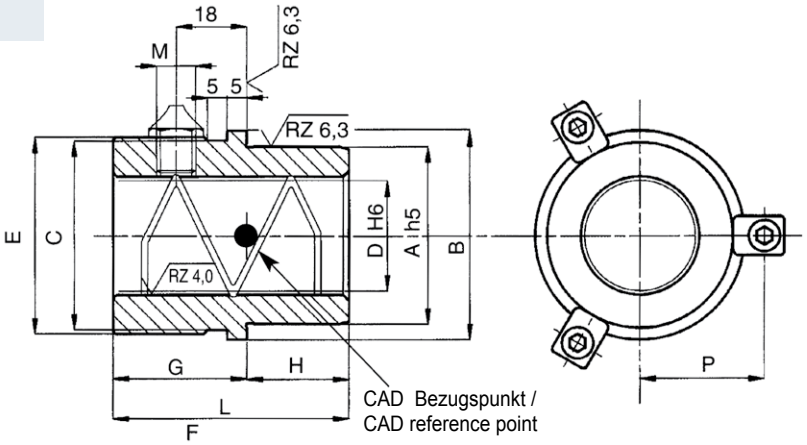
Mat.: 1.6757 / 61 - 63 HRC
Bronze: 40 - 45 HRC

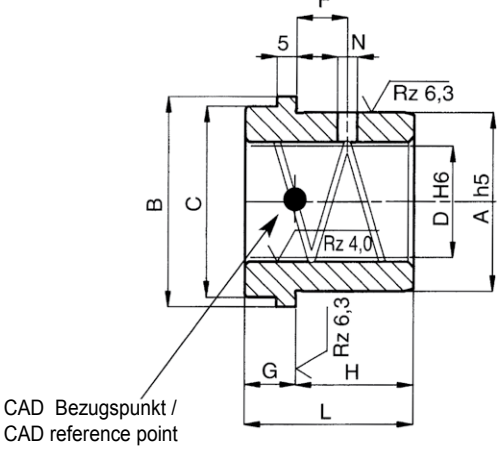
Lieferumfang:
- 3 Halteklammern mit Schrauben

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

Included:
- 3 holding clamps with screws

FS 651 / 30 x 90





mit kurzem Bund/short-headed style

FS 631
FS 632

D	A	B	C	Artikelnummer Article number	E	F	G	H	L	M	N	P	Aufnahmebohrung Mounting hole 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	$65^{+0,019}$

mit langem Bund/long-headed style

FS 641
FS 651
FS 655

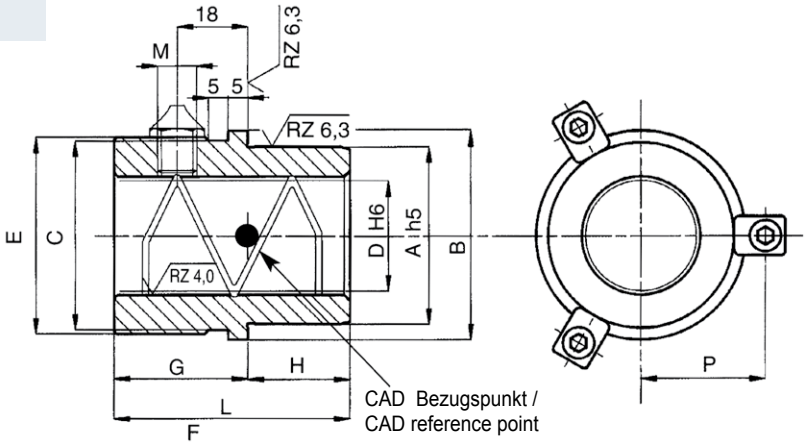
Mat.: 1.6757 / 61 - 63 HRC
Bronze: 40 - 45 HRC

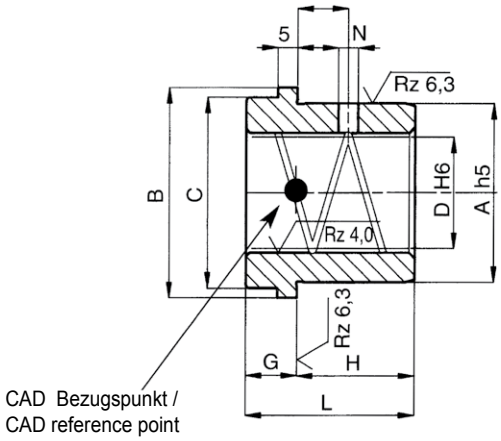
Lieferumfang:
- 3 Halteklammern mit Schrauben

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

Included:
- 3 holding clamps with screws

FS 651 / 63 x 130





mit kurzem Bund/short-headed style

FS 631
FS 632

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

[FS]

FS 457
FS 458
FS 453

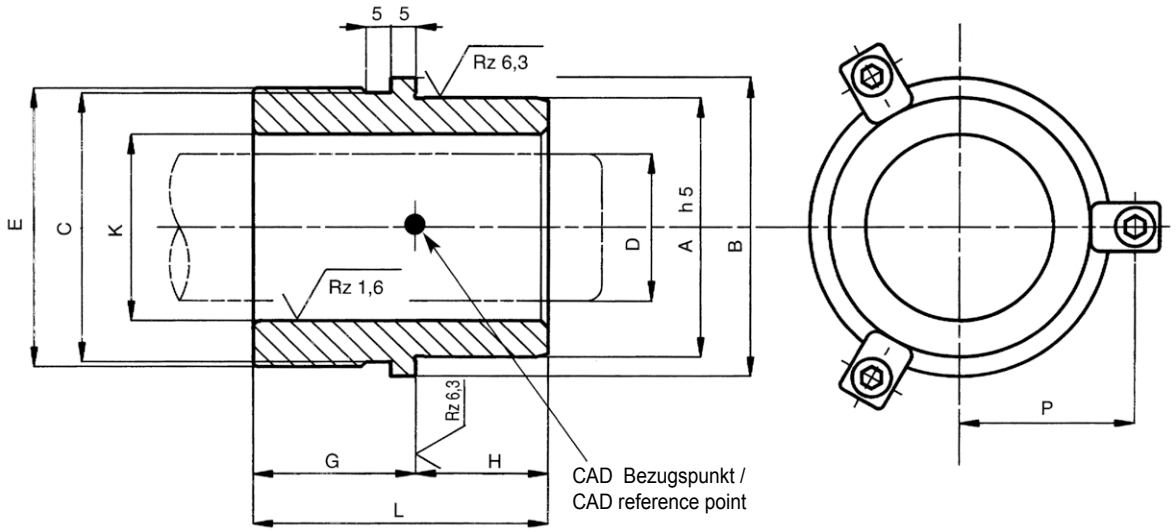
Mat.: 1.6757 / 61 - 63 HRC

Lieferumfang:
- 3 Halteklammern mit Schrauben

Mat.: 1.6757 / 61 - 63 HRC

Included:
- 3 holding clamps with screws

FS 453 / 30 x 90



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

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

FS 425

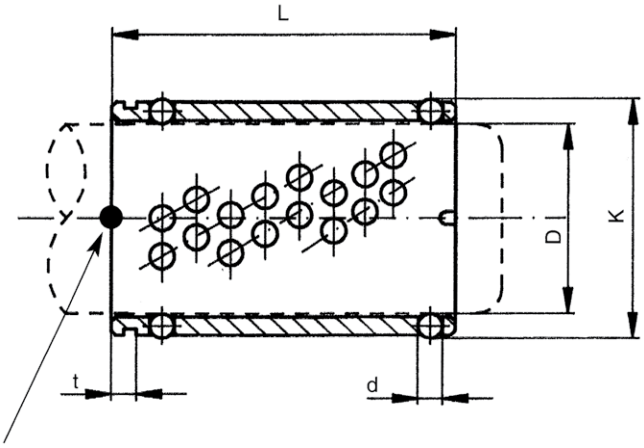
Mat.: Messing
Stahlkugeln: Güteklasse AAA

Sicherungsring im Lieferumfang enthalten.

Mat.: Brass
Steel balls, grade AAA

Safety ring included

FS 425 / 25 x 90



CAD Bezugspunkt /
CAD reference point

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

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

[FS]

FS 424

Mat.: Aluminium
Stahlkugeln: Güteklasse AAA

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

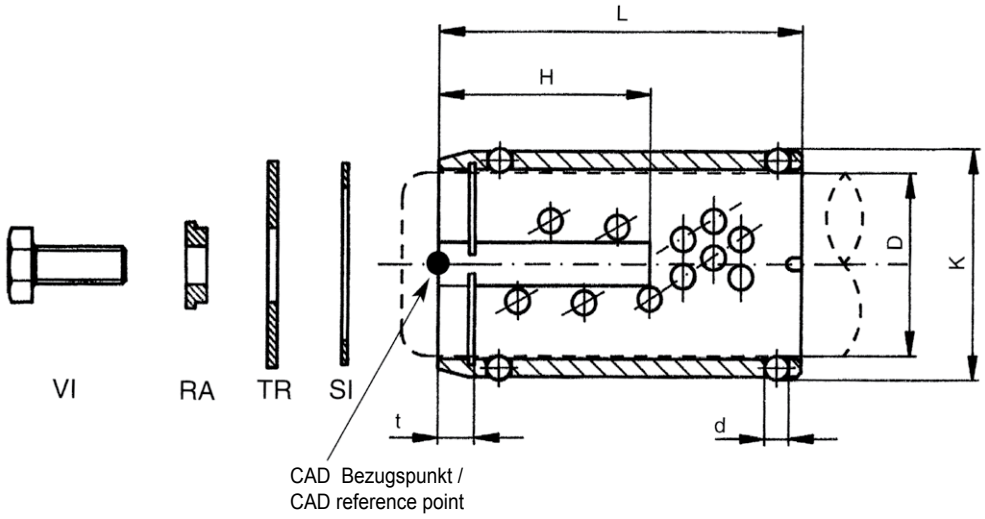
Kugelkäfige vorzugsweise für den Einbau im Unterteil.

Mat.: Aluminium
Steel balls, grade AAA

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

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

FS 424 / 32 x 105



D	K	d	t	H	L	Anzahl Kugeln 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 424

Mat.: Aluminium
Stahlkugeln: Güteklasse AAA

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

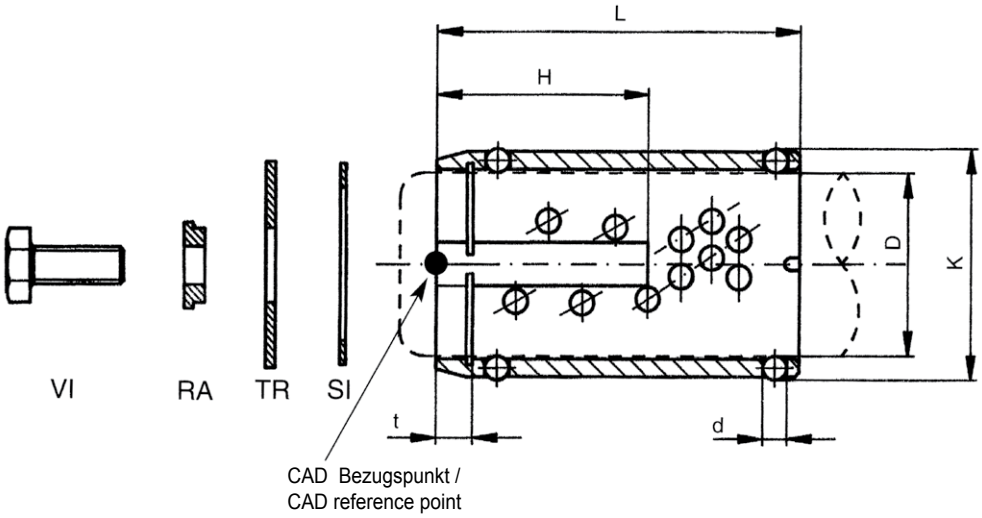
Kugelkäfige vorzugsweise für den Einbau im Unterteil.

Mat.: Aluminium
Steel balls, grade AAA

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

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

FS 424 / 52 x 105

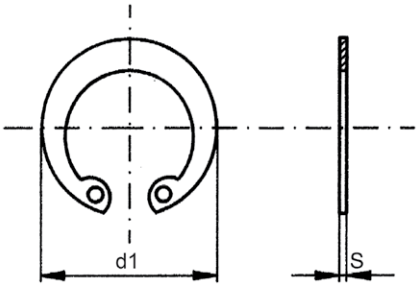


D	K	d	t	H	L	Anzahl Kugeln Number of balls
40	48	4	5	40	**70**	159
40	48	4	5	50	**85**	198
40	48	4	5	75	**120**	288
42	50	4	5	40	**70**	159
42	50	4	5	50	**85**	198
42	50	4	5	75	**120**	288
50	58	4	5	45	**90**	245
50	58	4	5	55	**105**	293
50	58	4	5	80	**130**	363
52	60	4	5	45	**90**	245
52	60	4	5	55	**105**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

[FS]

FS 424 / SI

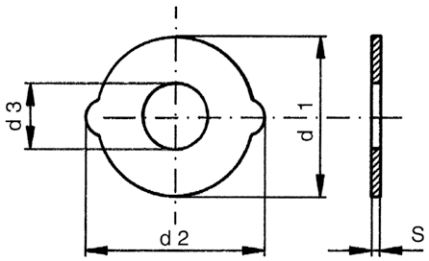
FS 424 / SI 1



Größe Size	D 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

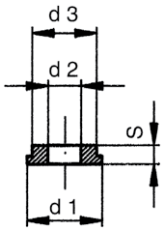
FS 424 / TR 1



Größe Size	D 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 424 / RA

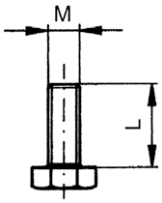
FS 424 / RA 1



Größe Size	D 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 Size	D 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]

FS 460

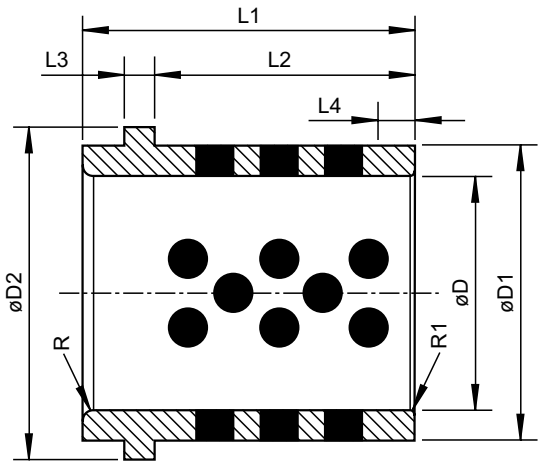
Mat.: Bronze-Graphit

Haltestücke bitte gesondert bestellen!

Mat.: Bronze-graphite

Holding clamps need to be ordered separately!

FS 460 / 40



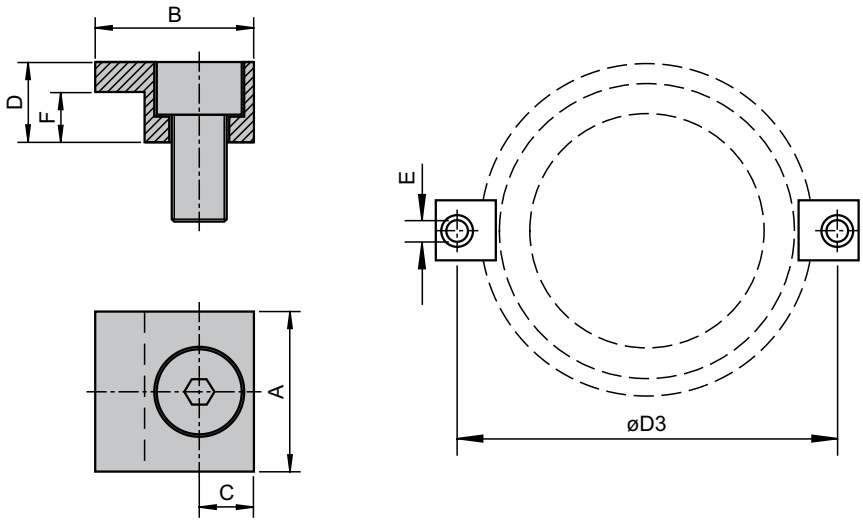
D H7	D1 h6	D2	D3	L1	L2	L3	L4	Haltestück Typ Holding clamps type
24	32	40	58	40	32	6,3	4,0 x 3°	FS 460 HS 1
25	32	40	58	40	32	6,3	4,0 x 3°	FS 460 HS 1
30	40	50	66	50	40	6,3	4,0 x 3°	FS 460 HS 1
32	40	50	66	50	40	6,3	4,0 x 3°	FS 460 HS 1
40	50	63	79	63	50	6,3	5,0 x 3°	FS 460 HS 1
42	50	63	79	63	50	6,3	5,0 x 3°	FS 460 HS 1
50	63	71	89	71	56	6,3	6,3 x 3°	FS 460 HS 1
52	63	71	89	71	56	6,3	6,3 x 3°	FS 460 HS 1
63	80	90	123	80	63	10	8,0 x 3°	FS 460 HS 2
80	100	112	143	100	80	10	10,0 x 3°	FS 460 HS 2
100	125	140	168	125	106	10	12,5 x 3°	FS 460 HS 2
125	160	180	203	160	132	10	16,0 x 3°	FS 460 HS 2
160	200	220	243	200	170	10	16,0 x 3°	FS 460 HS 2

FS 460 HS

nach DIN 9832

DIN 9832

FS 460 HS 1



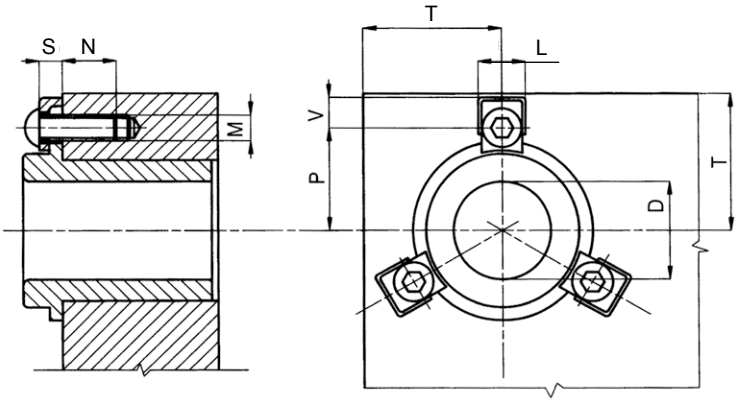
Typ Type	A	B	C	D	E	F	Schraube Screw
HS 1	20	20	7,5	10	7,0	6,3	M6x16
HS 2	32	32	11,0	16	11,5	10,0	M10x20

FS 955

Haltestücke werden mit Schrauben geliefert

Holding clamps come with corresponding screws

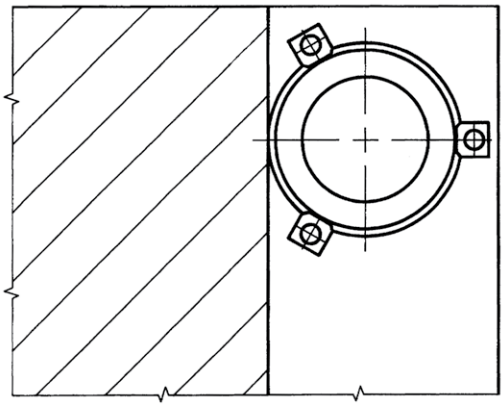
FS 955 / A



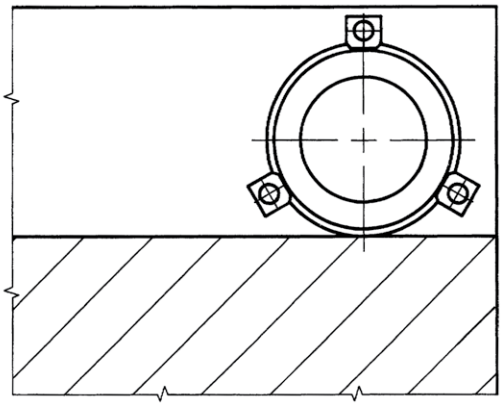
Ausführung Style	D	L	M	N	S	V
A	18-19	12	M6	12	6,7	6,0
A	24-25	12	M6	12	6,7	6,0
B	30-32	14,5	M8	16	7	7,2
B	40-42	14,5	M8	16	7	7,2
B	50-52	14,5	M8	16	7	7,2
C	63-80	16	M8	16	7	10,5

für Bundbuchsen mit Stahl- oder Bronzebeschichtung for leader pin bushings with collar steel or bronze-plated			für Bundbuchsen mit Kugelführung 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



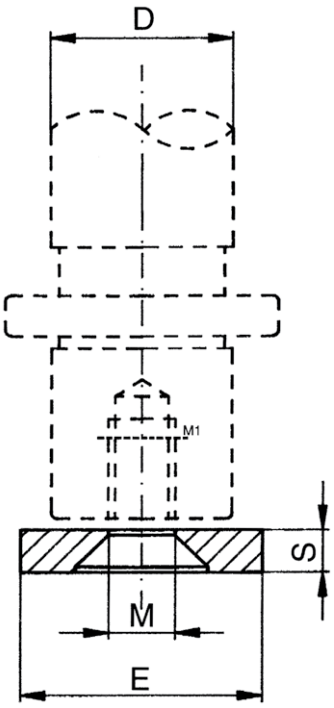
Position X

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	7	M12
E	50-52	62	9	M12
F	63	73	9	M12
G	80	93	12	M12

[FS]

FS 500

Mat.: Bronze

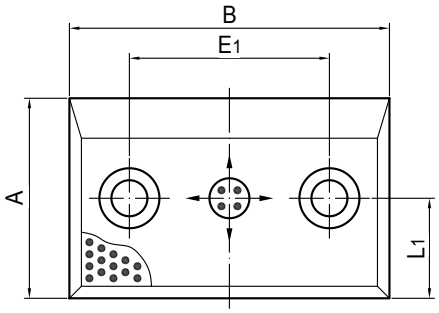
Gleitplatten aus Bronze mit Festschmierstoff-Einsätzen gewährleisten auch im Dauerbetrieb einen wartungsarmen Einsatz.

Mat.: Bronze

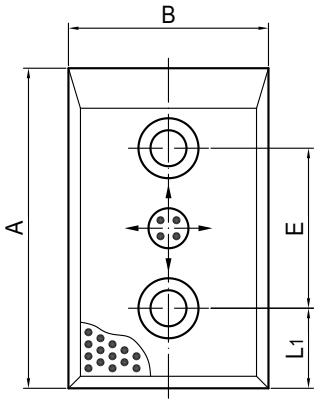
Bronze wear plates with self lubricating graphite plugs ensure even during long-term production cycles a low maintenance operation.

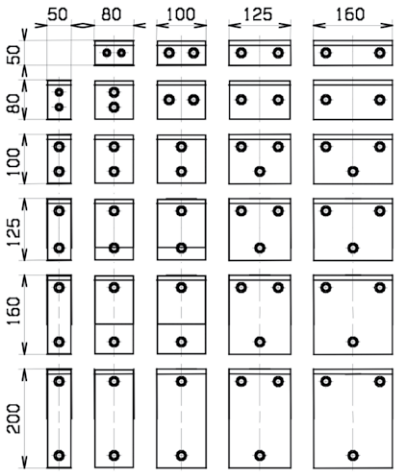
FS 500 / 50 x 100

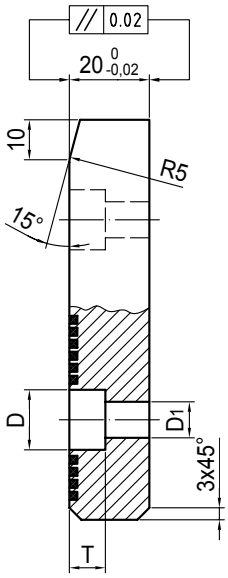
Type D



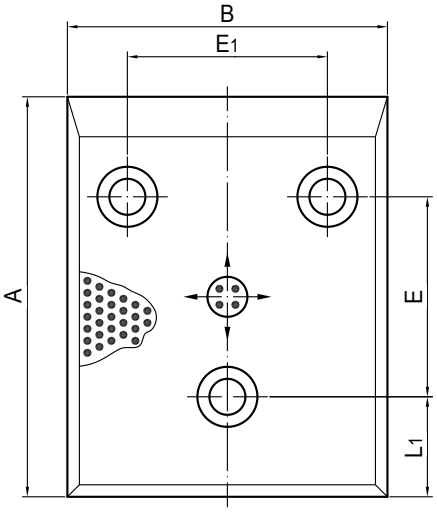
Tyep B







Type G



B	A	Type	E	E1	L1	D	D1	T	n
50	**80**	B	30	–	25	15	9	9	2
50	**100**	B	50	–	25	20	13,5	13	2
50	**125**	B	75	–	25	20	13,5	13	2
50	**160**	B	110	–	25	20	13,5	13	2
50	**200**	B	150	–	25	20	13,5	13	2
80	**50**	D	–	30	25	15	9	9	2
80	**80**	B	30	–	25	20	13,5	13	2
80	**100**	B	50	–	25	20	13,5	13	2
80	**125**	B	75	–	25	20	13,5	13	2
80	**160**	B	110	–	25	20	13,5	13	2
80	**200**	B	150	–	25	20	13,5	13	2
100	**50**	D	–	50	25	20	13,5	13	2
100	**80**	D	–		40	20	13,5	13	2
100	**100**	B	50	–	25	20	13,5	13	2
100	**125**	B	75	–	25	20	13,5	13	2
100	**160**	B	110	–	25	20	13,5	13	2

B	A	Type	E	E1	L1	D	D1	T	n
100	**200**	B	150	–	25	20	13,5	13	2
125	**50**	D	–	75	25	20	13,5	13	2
125	**80**	D	–	75	40	20	13,5	13	2
125	**100**	G	50	75	25	20	13,5	13	3
125	**125**	G	75	75	25	20	13,5	13	3
125	**160**	G	110	75	25	20	13,5	13	3
125	**200**	G	150	75	25	20	13,5	13	3
160	**50**	D	–	110	25	20	13,5	13	2
160	**80**	D	–	110	40	20	13,5	13	2
160	**100**	G	50	110	25	20	13,5	13	3
160	**125**	G	75	110	25	20	13,5	13	3
160	**160**	G	110	110	25	20	13,5	13	3
160	**200**	G	150	110	25	20	13,5	13	3

FS 502

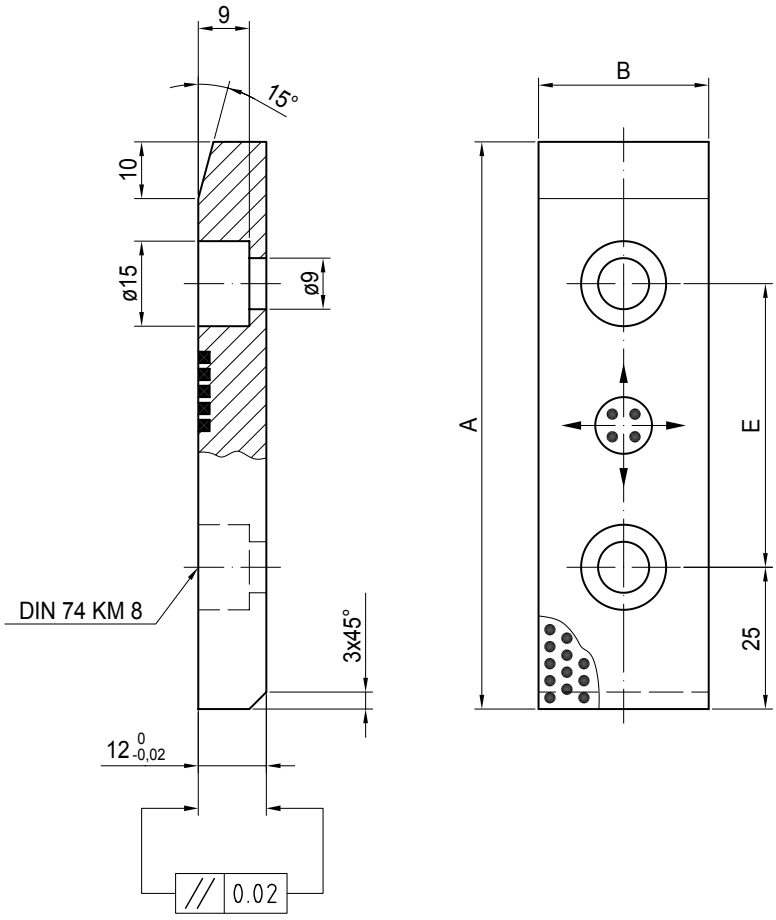
Mat.: Bronze

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



B	A	E
30	**80**	30
30	**100**	50
30	**125**	75
30	**160**	110
30	**200**	150
40	**80**	30
40	**100**	50
40	**125**	75
40	**160**	110
40	**200**	150
50	**80**	30
50	**100**	50
50	**125**	75
50	**160**	110

B	A	E
50	**200**	150
60	**80**	30
60	**100**	50
60	**125**	75
60	**160**	110
60	**200**	150
80	**80**	30
80	**100**	50
80	**125**	75
80	**160**	110
80	**200**	150

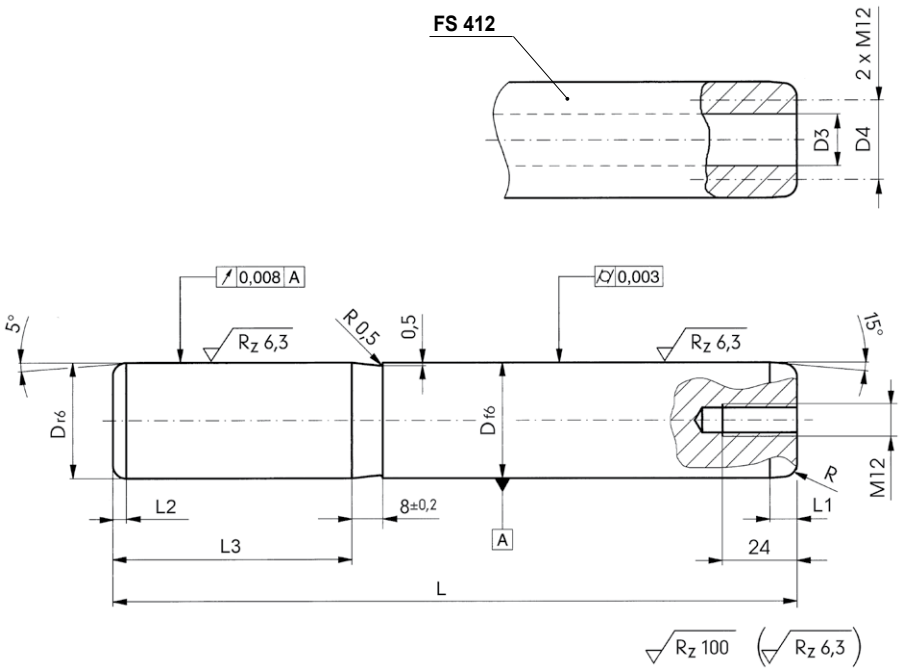
[FS]

INFO

FS 410
FS 412

Technischer Hinweis:
Säulen-Aufnahmebohrungen: H7
Säulentyp **FS 410** kann ab ø80 mm mit 2 Transportgewinden M12 geliefert werden (bitte angeben).
Säulentyp **FS 412** bis ø63 mm ohne Hohlbohrung, ab ø80 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).



INFO

FS 330 … RM
FS 340 … RM
FS 350 … 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 Verbesserungen 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 NAMSA - 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 NAMSA-Class 6 tested and certified as bio-compatible. The whole coating process is carried out in compliance with DOD-L-85645 A Type 1.

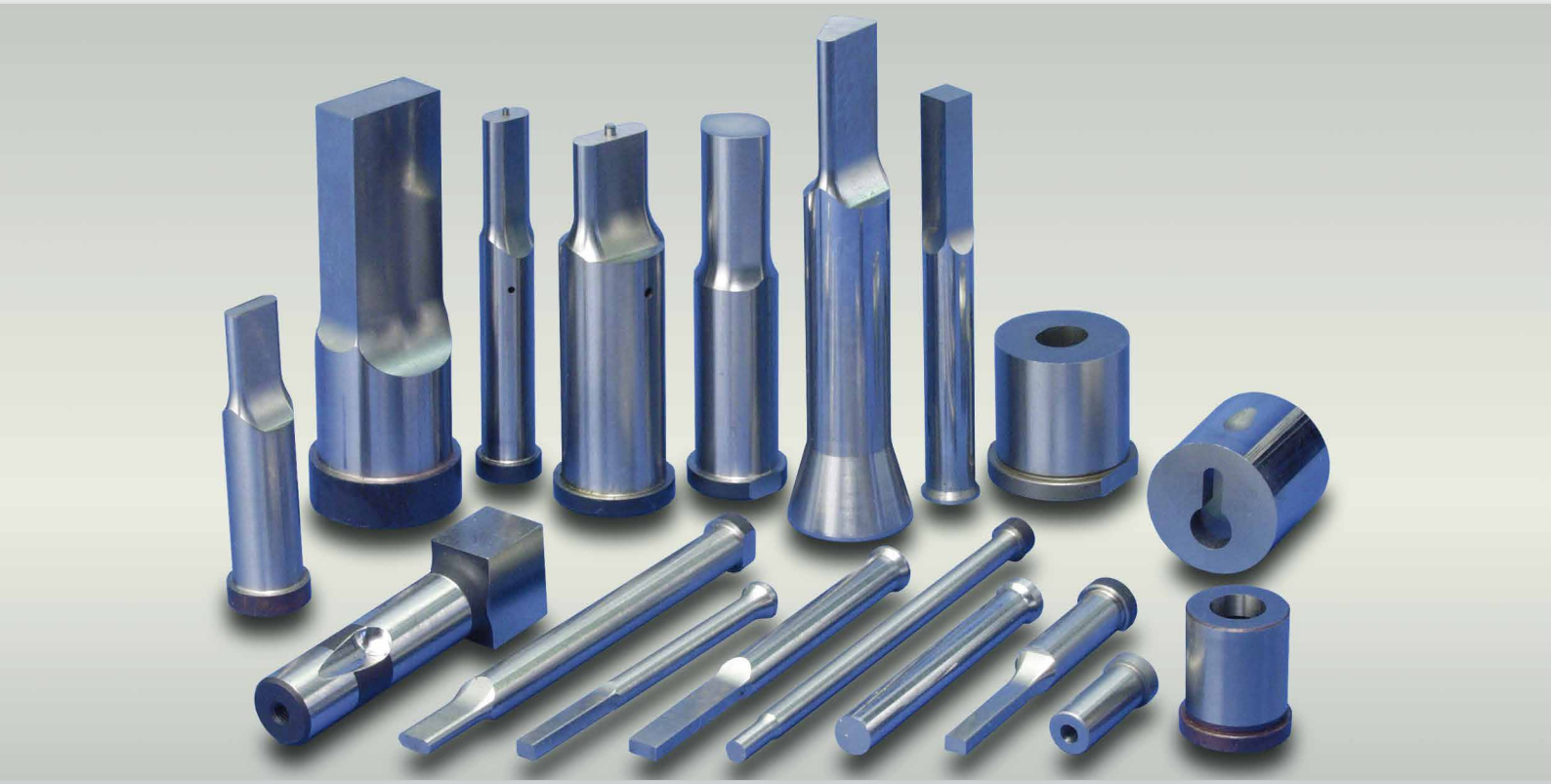
In our program the products from **FS 330 / ...** to **FS 350 / ...** and **FS 430 / …** to **FS 450 / …** are RM-coated as standards, all other (guiding- and other) products can be treated upon request.

Please contact us with your specific application.

zertifiziert ISO 9001 for you Cert

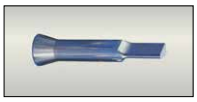
MSPN GMBH

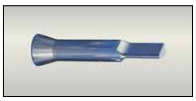
Märkische Stanz-Partner

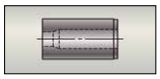
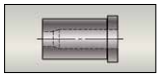
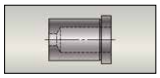
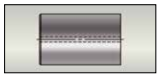
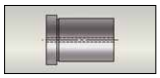
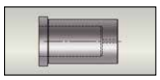
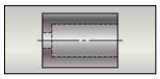


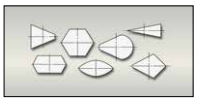
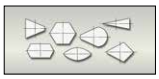
[schneidelemente]

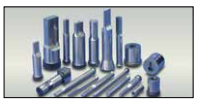
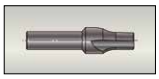
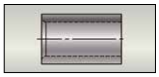
[cuttingelements]

	Schneidstempel	Punches	Best.-Nr. Order no.	Seite Page
	Schneidstempel 30° Kopf	Punches 30° head	SE 730	SE.23
	Schneidstempel 30° Kopf, abgesetzter Schaft	Punches 30° head, shouldered shank	SE 732	SE.24
	Schneidstempel 30° Kopf, abgesetzter Schaft, Typen 30F, 30O, 30R, 30S	Punches 30° head, shouldered shank Types 30F, 30O, 30R, 30S	SE 733 . . .	SE.25
	Schneidstempel DIN 9861, Form D, HSS	Punches DIN 9861, Form D, HSS	SE 775	SE.2
	Schneidstempel DIN 9861, Form D, HWS auslaufend	Punches DIN 9861, Form D, HWS phasing out	SE 765	SE.1
	Schneidstempel DIN 9861, Form C, abgesetzter Schaft, HSS	Punches DIN 9861, Form C, shouldered shank, HSS	SE 785	SE.4
	Schneidstempel DIN 9861, Form C, abgesetzter Schaft, HWS auslaufend	Punches DIN 9861, Form C, shouldered shank, HWS phasing out	SE 784	SE.3
	Schneidstempel DIN 9861, Form C, abgesetzter Schaft, Typen F, O, R, S	Punches DIN 9861, Form C, shouldered shank, Types F, O, R, S	SE 786 .	SE.5
	Schneidstempel ISO 8020 mit federndem Auswerferstift	Punches ISO 8020 with spring ejector	SE 737	SE.12
	Schneidstempel ISO 8020 mit federndem Auswerferstift, Type EKP	Punches ISO 8020 with spring ejector Type EKP	SE 737 EKP	SE.13
	Schneidstempel ISO 8020 mit federndem Auswerferstift Typen EKF, EKO, EKR, EKS	Punches ISO 8020 with spring ejector Types EKF, EKO, EKR, EKS	SE 737 . . .	SE.14
	Schneidstempel ISO 8020, Type KF, KO, KR, KS, abgesetzter Schaft	Punches ISO 8020, type KF, KO, KR, KS, shouldered shank	SE 731 . . ISO	SE.11
	Schneidstempel ISO 8020, Type KP, abgesetzter Schaft	Punches ISO 8020, type KP, shouldered shank	SE 716 KP ISO	SE.9
	Schneidstempel mit Langlochprofil über die Gesamtlänge	Punches with oblong shape over the total length	SE 740 SE 741	SE.29
	Schneidstempel mit Langlochprofil über die Gesamtlänge, mit Senkkopf	Punches with oblong shape over the total length with countersunk head	SE 744 SE 745	SE.26
	Schneidstempel mit Rechteckprofil über die Gesamtlänge	Punches with rectangular shape over the total length	SE 738 SE 739	SE.28
	Schneidstempel mit Rechteckprofil über die Gesamtlänge, mit Senkkopf	Punches with rectangular shape over the total length with countersunk head	SE 748 SE 749	SE.27
	Schneidstempel Posaunenhals	Punches trumpet head	SE 750	SE.16
	Schneidstempel Posaunenhals, abgesetzter Schaft	Punches trumpet head, shouldered shank	SE 751	SE.17
	Schneidstempel Posaunenhals, abgesetzter Schaft, Typen PF, PO, PR, PS	Punches trumpet head, shouldered shank Types PF, PO, PR, PS	SE 752 . .	SE.18

	Schneidstempel	Punches	Best.-Nr. Order no.	Seite Page
	Schneidstempel Posaunenhals mit federndem Auswerferstift	Punches trumpet head with spring ejector	SE 753	SE.19
	Schneidstempel Posaunenhals, abgesetzter Schaft, mit federndem Auswerferstift	Punches trumpet head, shouldered shank with spring ejector	SE 754	SE.20
	Schneidstempel Posaunenhals abgesetzter Schaft, mit federndem Auswerferstift, Typen EPF, EPO, EPR, EPS	Punches trumpet head, shouldered shank with spring ejector, Types EPF, EPO, EPR, EPS	SE 755 . . .	SE.21
	Schneidstempel, zylindrischer Kopf Type K ISO 8020	Punches, cylindrical head Type K ISO 8020	SE 712 ISO	SE.7
	Schneidstempel, zylindrischer Kopf Type K	Punches, cylindrical head Type K	SE 712	SE.6
	Schneidstempel, abgesetzter Schaft Type KP	Punches, shouldered shank Type KP	SE 716 KP	SE.8
	Schneidstempel, abgesetzter Schaft Typen KF, KO, KR, KS	Punches, shouldered shank Types KF, KO, KR, KS	SE 731 . .	SE.10

	Schneidbuchsen	Die buttons	Best.-Nr. Order no.	Seite Page
	Schneidbuchsen DIN 9845, Form A ohne Bund	Die buttons DIN 9845 A without collar	SE 791	SE.30
	Schneidbuchsen DIN 9845, Form B mit Bund	Die buttons DIN 9845 B with collar	SE 792	SE.31
	Schneidbuchsen mit Bund Type EKD, ISO 8977B	Die buttons with collar Type EKD, ISO 8977B	SE 713 EKD	SE.34
	Schneidbuchsen mit Bund Typen EKDF, EKDO, EKDR, EKDS, ISO 8977B	Die buttons with collar Types EKDF, EKDO, EKDR, EKDS, ISO 8977B	SE 717	SE.36
	Schneidbuchsen mit Startlochbohrung durchgehend, Type EDL, ohne Bund ISO 8977A	Die buttons with start hole, Type EDL, without collar, ISO 8977A	SE 711 EDL	SE.37
	Schneidbuchsen mit Startlochbohrung durchgehend, Type EKDL, mit Bund ISO 8977B	Die buttons with start hole, Type EKDL, with collar, ISO 8977B	SE 713 EKDL	SE.38
	Schneidbuchsen mit Startlochbohrung und Ausfallloch, Type EDM, ohne Bund, ISO 8977A	Die buttons with start hole and counterbore relief, Type EDM, without collar, ISO 8977A	SE 711 EDM	SE.39
	Schneidbuchsen mit Startlochbohrung und Ausfallloch, Type EKDM, mit Bund, ISO 8977B	Die buttons with start hole and counterbore relief, Type EKDM, with collar, ISO 8977B	SE 713 EKDM	SE.40
	Schneidbuchsen ohne Bund Type ED, ISO 8977A	Die buttons without collar Type ED, ISO 8977A	SE 711 ED	SE.33
	Schneidbuchsen ohne Bund, Typen EDF, EDO, EDR, EDS, ISO 8977A	Die buttons without collar Types EDF, EDO, EDR, EDS, ISO 8977A	SE 715 . . .	SE.35

	**Sonderschneid-elemente**	**Special punches**	**Best.-Nr. Order no.**	**Seite Page**
	Formbeispiele	Shape examples		**SE.41**

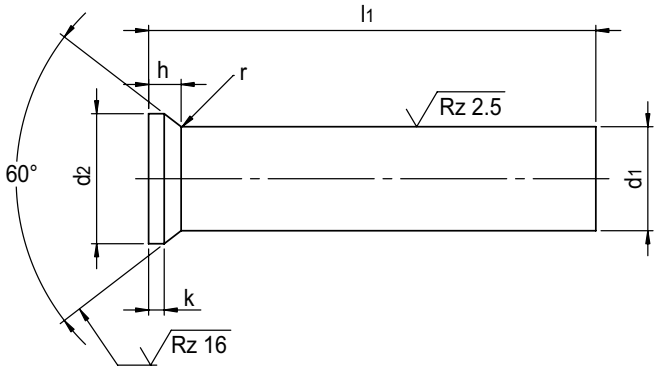
	**Zubehör Bereich Schneidelemente**	**Accessories**	**Best.-Nr. Order no.**	**Seite Page**
	Fangstifte	Pilot punches	**SE 709**	**SE.15**
	Kopfsenker für Posaunenhals-Stempel	Counterbore-tools for trumpet-heads	**SE 020**	**SE.22**
	Stempelführungsbuchsen DIN 9845, Form C	Punch - guide bushings, DIN 9845 C	**SE 793**	**SE.32**

SE 765

Mat.: HWS
Härte Schaft: 62 ±2 HRC
Kopf: 50 ±5 HRC

Mat.: A2
Hardness shank: 62 ±2 HRC
Head: 50 ±5 HRC

SE 765 / 2,50 x 71



d1 h6	d2 ±0,05	h +0,2	k +0,2	r	l1 +0,5 71	80	100
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	$0,6^{+0,4}$	●	●	●

d1 h6	d2 ±0,05	h +0,2	k +0,2	r	l1 +0,5 71	80	100
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	$1,5^{+0,5}$	●	●	●

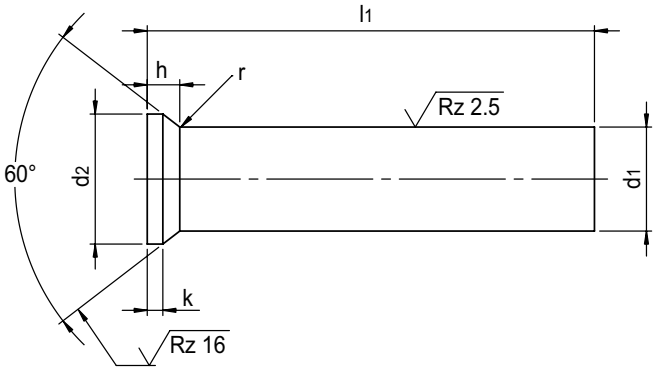
auslaufend
phasing out

SE 775

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

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

SE 775 / 2,50 x 100



d1 h6	d2 ±0,05	h +0,2	k +0,2	r	l1 +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	$0{,}6^{+0{,}4}$	●	●	●	●

d1 h6	d2 ±0,05	h +0,2	k +0,2	r	l1 +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	$1{,}5^{+0{,}5}$	●	●	●	●

SE 784

Mat.: HWS
Härte Schaft: 62 ±2 HRC
Kopf: 50 ±5 HRC

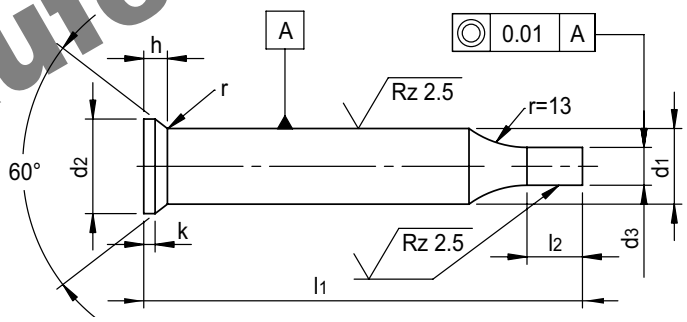
Länge l_2 frei wählbar!

Mat.: A2
Hardness shank: 62 ±2 HRC
Head: 50 ±5 HRC

Length l_2 freely selectable!

SE 784 / 5,0 x 71 / 2,5

auslaufend
phasing out



d1 h6	d3 h6	Stufung Step	l2 +0,5	l1 +0,5		
				71	80	100
1,5	**0,5 - 1,4**	0,1	7	●	●	●
2,0	**0,5 - 1,9**	0,1	7	●	●	●
3,0	**1,6 - 2,9**	0,1	7	●	●	●
4,0	**1,6 - 3,9**	0,1	10	●	●	●
5,0	**2,5 - 4,9**	0,1	10	●	●	●
6,0	**3,0 - 5,9**	0,1	10	●	●	●
8,0	**4,0 - 7,9**	0,1	13	●	●	●
10,0	**5,0 - 9,9**	0,1	17	●	●	●
13,0	**9,0 - 12,9**	0,1	17	●	●	●
16,0	**12,0 - 15,9**	0,5	17	●	●	●
20,0	**16,0 - 19,9**	0,5	17	●	●	●

SE 785

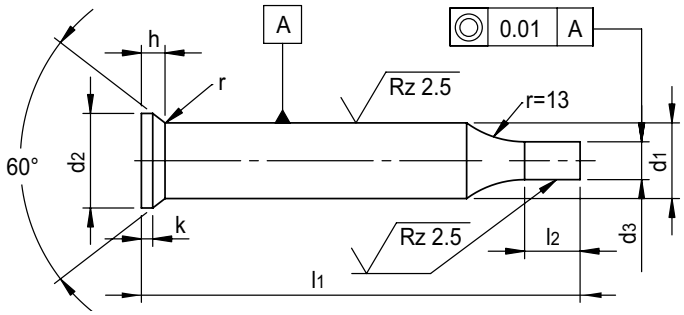
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

Länge l_2 frei wählbar!
Fehlende Maße siehe SE 775 (Seite SE.2)

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l_2 freely selectable!
for missing dimensions please see **SE 775** (page SE2)

SE 785 / 5,0 x 71 / 2,5



d1 h6	d3 h6 Stufung/step 0,01	l2 +0,5	l1 +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 786 .

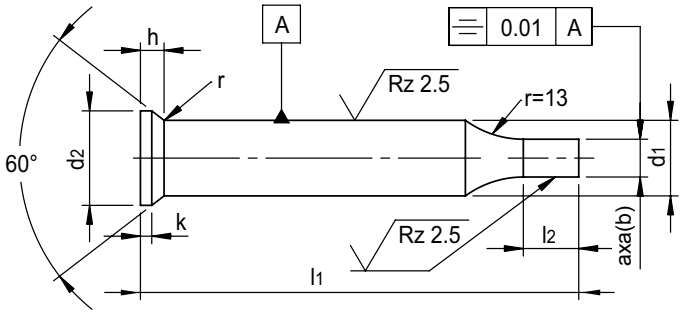
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

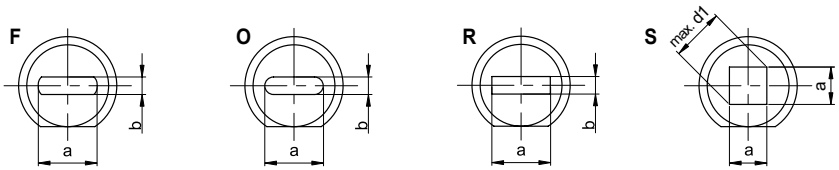
Länge l2 frei wählbar!
Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).
Fehlende Maße siehe SE 775 (Seite SE.2)

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!
Punches without key flat available upon request.
For missing dimensions please see **SE 775** (page SE.2)

SE 786 F / 8 x 80 / a x b





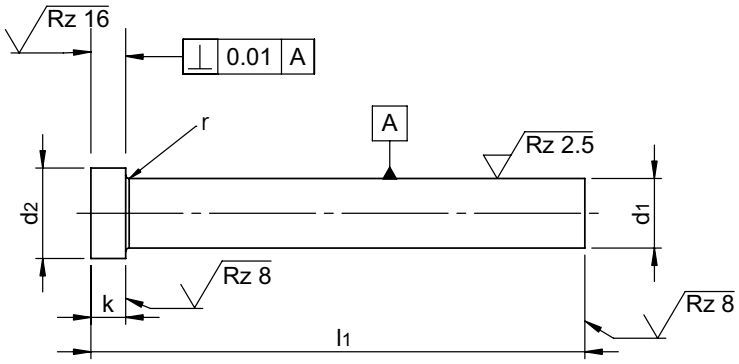
d1 h6	a x b ±0,01 Stufung/step 0,01 ≥ ≤	l2 +0,5	l1 +0,5 71	80	100	130
5	2,5 - 4,9	10	●	●	●	●
6	3,0 - 5,9	10	●	●	●	●
8	4,0 - 7,9	13	●	●	●	●
10	5,0 - 9,9	17	●	●	●	●
13	9,0 - 12,9	17	●	●	●	●
16	12,0 - 15,9	17	●	●	●	●
20	16,0 - 19,9	17	●	●	●	●
25	20,0 - 24,9	17	●	●	●	●
32	27,0 - 31,9	17	●	●	●	●
38	33,0 -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

SE 712

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

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

SE 712 / 8 x 80



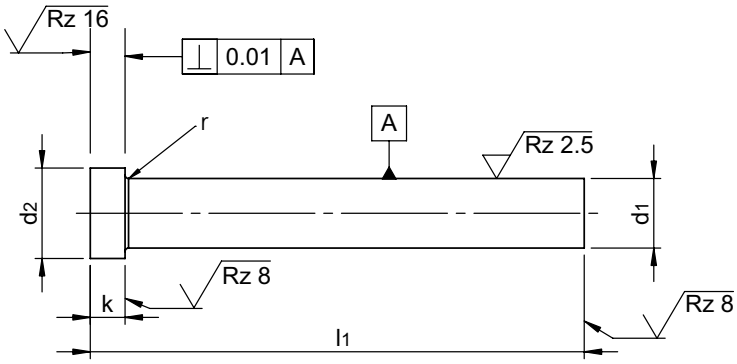
d1 m5	d2 -0,15	k +0,2 +0,1	r +0,1	l1 +0,5 +0,2					
				63	71	80	90	100	120
3	5	3	0,2	●	●	●	●		
4	6	3	0,2	●	●	●	●	●	
5	8	5	0,3	●	●	●	●	●	●
6	9	5	0,3	●	●	●	●	●	●
8	11	5	0,3	●	●	●	●	●	●
10	13	5	0,3	●	●	●	●	●	●
13	16	5	0,5	●	●	●	●	●	●
16	19	6	0,5	●	●	●	●	●	●
20	24	6	0,5	●	●	●	●	●	●
25	29	10	0,5	●	●	●	●	●	●
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.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

SE 712 ISO / 8 x 80



d1 m5	d2 -0,15	k +0,2 +0,1	r +0,1	l1 +0,5 +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 716 KP

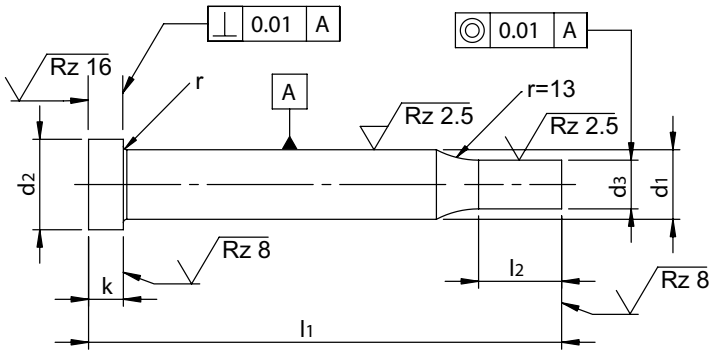
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

Länge l2 frei wählbar!

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!

SE 716 KP / 10 x 100 / 8,5



d1 m5	d2 -0,15	d3 +0,01 Stufung/step 0,01	k +0,2 +0,1	r +0,1	l2 ±0,5	l1 +0,5 +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**	6	0,5	17	●	●	●	●	●	●
20	24	**16,0 - 19,9**	6	0,5	17	●	●	●	●	●	●
25	29	**20,0 - 24,9**	10	0,5	17	●	●	●	●	●	●
32	36	**27,0 - 31,9**	12	0,5	17	●	●	●	●	●	●
38	45	**33,0 - 37,9**	15	0,5	17	●	●	●	●	●	●

SE 716 KP ISO

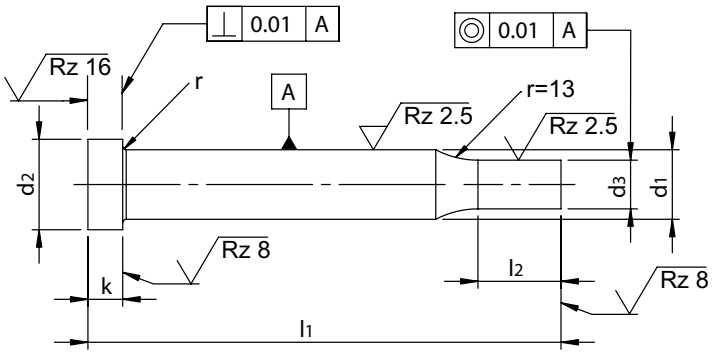
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

Länge l2 frei wählbar!

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!

SE 716 KP / ISO / 10 x 100 / 8,5



d1 m5	d2 -0,15	d3 +0,01 Stufung/step 0,01	k +0,2 +0,1	r +0,1	l2 ±0,5	l1 +0,5 +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 731 . .

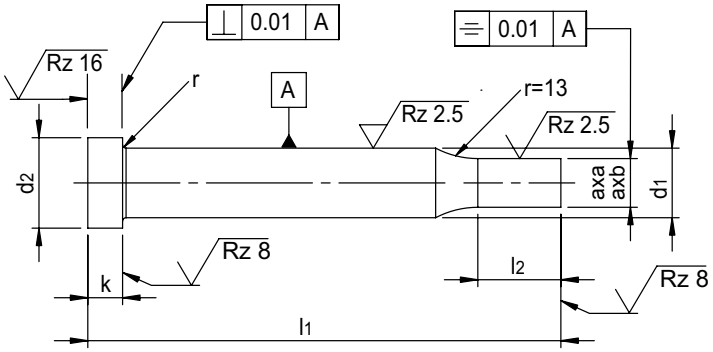
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

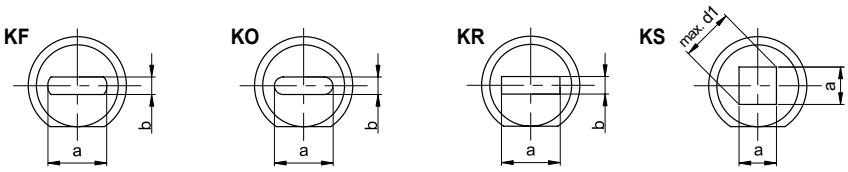
Länge l2 frei wählbar! Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable! Punches without key flat available upon request.

SE 731 KO / 10 x 100 / a x b





d1 m5	a x b ±0,01 Stufung/step 0,01 ≥ ≤	d2 -0,15	k +0,2 +0,1	r +0,1	l2 ±0,5	l1 +0,5 +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	6	0,5	17	●	●	●	●	●	●
20	**16,0 - 19,9**	24	6	0,5	17	●	●	●	●	●	●
25	**20,0 - 24,9**	29	10	0,5	17	●	●	●	●	●	●
32	**27,0 - 31,9**	36	12	0,5	17	●	●	●	●	●	●
38	**33,0 - 37,9**	45	15	0,5	17	●	●	●	●	●	●

SE 731 . . ISO

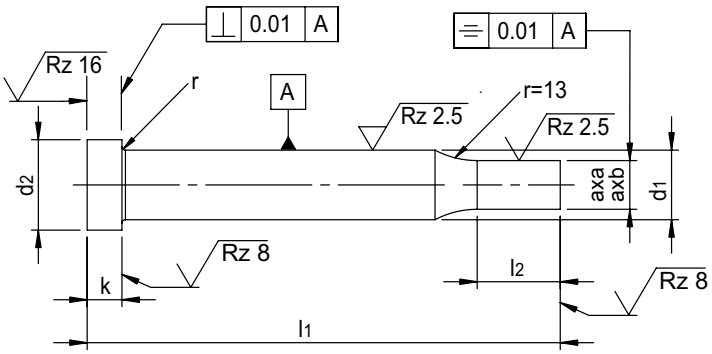
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

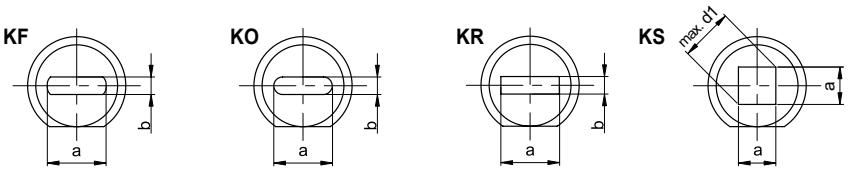
Länge l2 frei wählbar!
Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!
Punches without key flat available upon request.

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





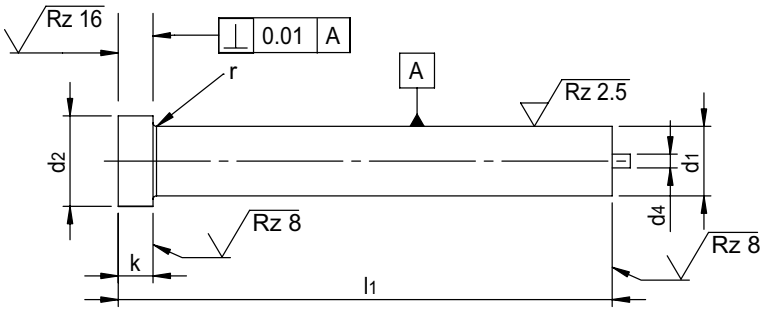
d1 m5	a x b ±0,01 Stufung/step 0,01 ≥ ≤	d2 -0,15	k +0,2 +0,1	r +0,1	l2 ±0,5	l1 +0,5 +0,2 63	71	80	90	100	120
3	1,6 - 2,9	5	3	0,2	7	●	●	●	●		
4	1,6 - 3,9	6	3	0,2	10	●	●	●	●	●	
5	2,5 - 4,9	8	5	0,3	10	●	●	●	●	●	●
6	3,0 - 5,9	9	5	0,3	10	●	●	●	●	●	●
8	4,0 - 7,9	11	5	0,3	13	●	●	●	●	●	●
10	5,0 - 9,9	13	5	0,3	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

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

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

SE 737 / 10 x 100



d1 m5	d2 -0,05	d4	k +0,2 +0,1	r +0,1	l1 +0,5 +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 737 EKP

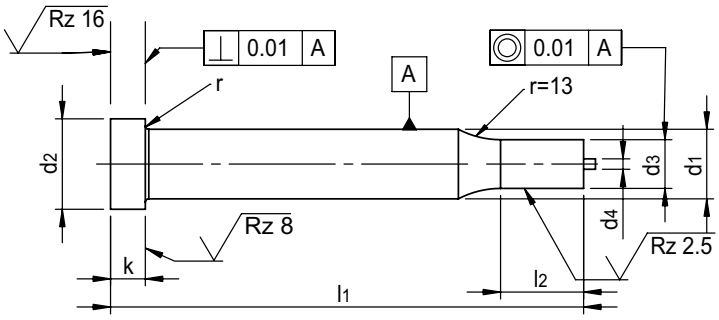
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

Länge l2 frei wählbar!

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!

SE 737 EKP / 10 x 100 / 8,5



d1 m5	d2 -0,15	d3 +0,01 Stufung/step 0,01	d4	k +0,2 +0,1	r +0,1	l2 ±0,5	l1 +0,5 +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 737 . . .

mit federndem Auswerferstift

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

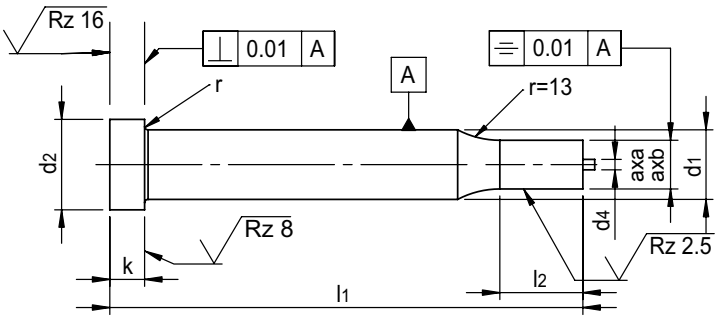
Länge l2 frei wählbar!
Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

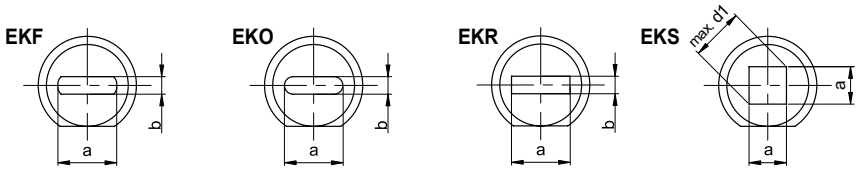
with spring ejector

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!
Punches without key flat available upon request.

SE 737 EKF / 10 x 100 / a x b





d1 m5	d2 -0,15	a x b ±0,01 Stufung/step 0,01 ≥ ≤	d4	k +0,2 +0,1	r +0,1	l2 ±0,5	l1 +0,5 +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 709

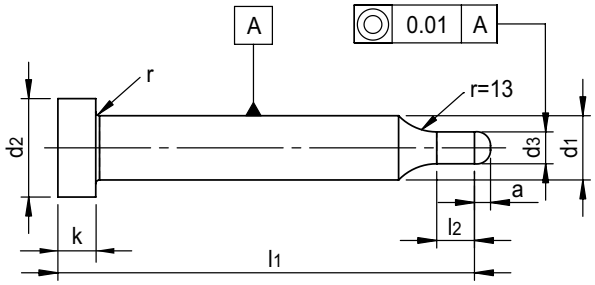
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

Gesamtlänge = l1 + a
Länge l2 frei wählbar!
Fehlende Maße siehe **SE 712** (Seite SE.6)

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Total length = l1 + a
Length l2 freely selectable!
for missing dimensions please see **SE 712** (Page SE.6)

SE 709 / 6 x 100 / 2,5



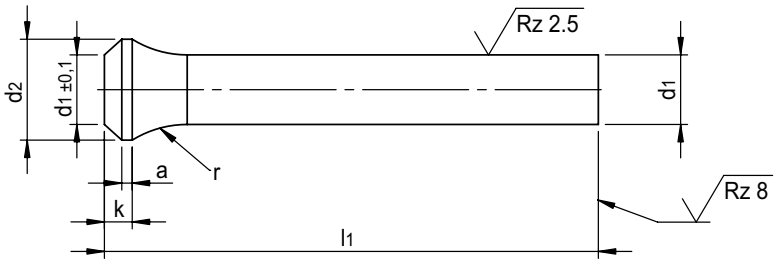
d1 m5	d3 +0,01 Stufung/step 0,01	l2	a	l1 +0,5 +0,2 63	71	80	90	100
5	**0,8 - 2,0**	10	3,0	●	●	●	●	●
6	**2,1 - 4,5**	10	4,5	●	●	●	●	●
8	**4,6 - 7,5**	13	6,5	●	●	●	●	●
10	**7,6 - 10,0**	17	8,0	●	●	●	●	●
13	**10,1 - 13,0**	17	9,5	●	●	●	●	●
16	**13,1 - 16,0**	17	11,5	●	●	●	●	●
20	**16,1 - 20,0**	17	13,5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

SE 750

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

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

SE 750 / 13,0 x 100



d1 h6	d2 -0,2	k +0,2	a	r -0,2	l1 +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	4	1,5	6,5	●	●	●		
3,5	5,0	4	1,5	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 751

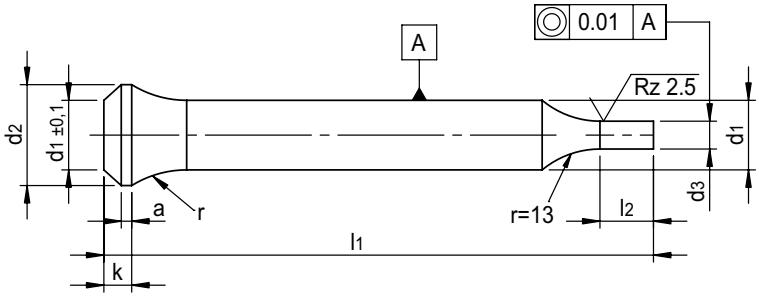
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

Länge l2 frei wählbar!

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!

SE 751 / 10,0 x 100 / 7,0



d1 h6	d3 h6 Stufung/step 0,01	d2 -0,2	k +0,2	a	r -0,2	l2 +0,5	l1 +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	4	1,5	6,5	7	●	●	●		
3,5	**1,6 - 3,4**	5,0	4	1,5	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 . .

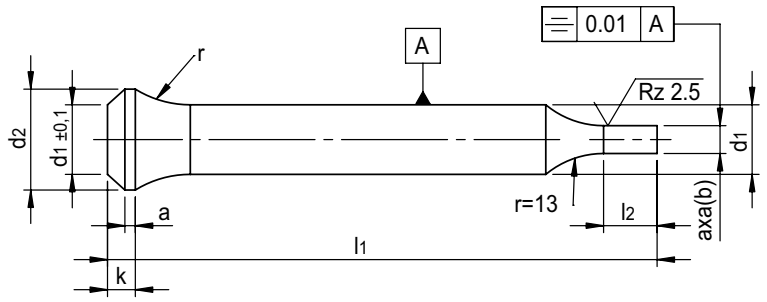
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

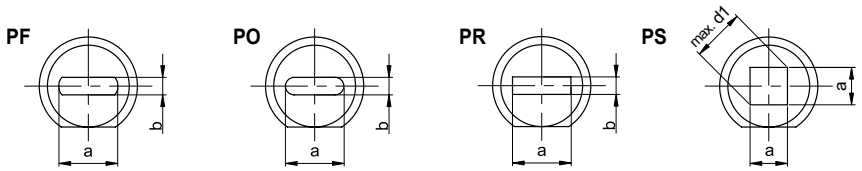
Länge l2 frei wählbar!
Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!
Punches without key flat available upon request.

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





d1 h6	a x b ±0,01 Stufung/step 0,01 ≥ ≤	d2 -0,2	k +0,2	a	r -0,2	l2 +0,5	l1 +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	4	1,5	6,5	7	●	●	●		
3,5	**1,6 - 3,4**	5,0	4	1,5	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 h6	a x b ±0,01 Stufung/step 0,01 ≥ ≤	d2 -0,2	k +0,2	a	r -0,2	l2 +0,5	l1 +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	●	●	●	●	●

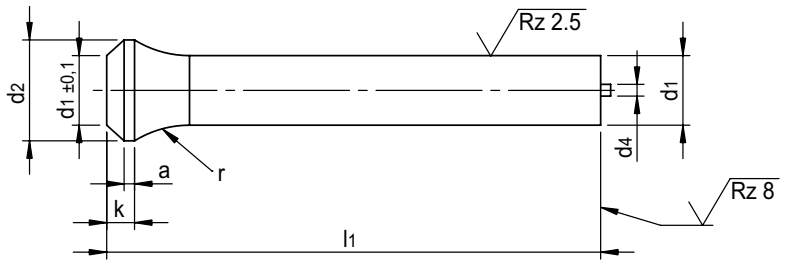
= bevorzugte Abmessungen / preferred dimensions

SE 753

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

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

SE 753 / 13,0 x 100



d1 h6	d2 -0,2	k +0,2	a	r -0,2	d4	l1 +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 754

mit federndem Auswerferstift

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

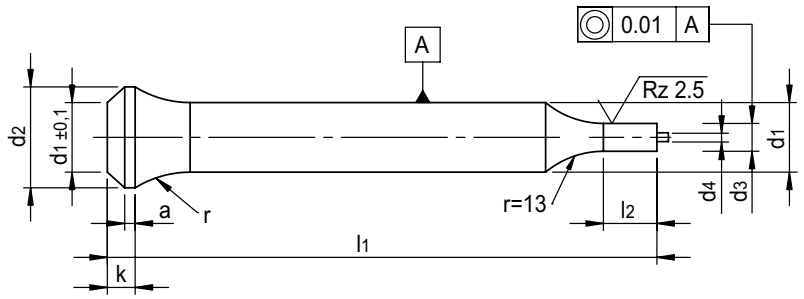
Länge l2 frei wählbar!

with spring ejector

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!

SE 754 / 10,0 x 100 / 7,0



d1 h6	d3 h6 Stufung/step 0,01 ≥ ≤	d2	k -0,2	a +0,2	r	l2 -0,2	d4 +0,5	l1 +0,5 71	80	90	100	120
5,0	**2,5 - 4,9**	7	4,0	1,5	10,0	10	1,0	●	●	●	●	
6,0	**3,0 - 5,9**	9	4,0	1,5	10,0	10	1,0	●	●	●	●	
8,0	**4,0 - 7,9**	11	4,0	1,5	12,0	13	1,5	●	●	●	●	●
10,0	**5,0 - 9,9**	14	4,0	1,5	15,0	17	1,5	●	●	●	●	●
13,0	**9,0 - 12,9**	17	4,0	1,5	15,0	17	1,5	●	●	●	●	●
16,0	**12,0 - 15,9**	20	4,0	1,5	15,0	17	2,3	●	●	●	●	●
20,0	**16,0 - 19,9**	25	4,0	1,5	15,0	17	2,3	●	●	●	●	●
25,0	**18,0 - 24,9**	30	4,0	1,5	15,0	17	2,3	●	●	●	●	●

Zwischenabmessungen auf Anfrage! / Intermediate dimensions on request!

SE 755 . . .

mit federndem Auswerferstift

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

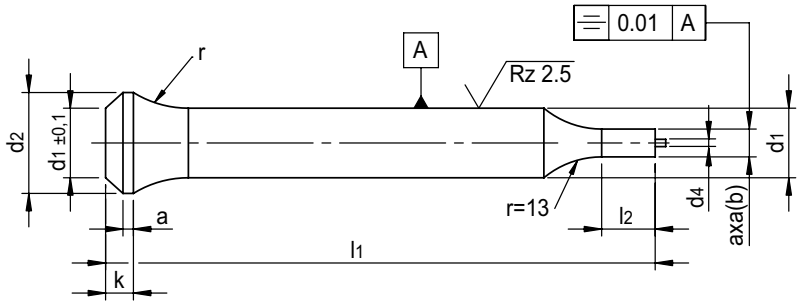
Länge l2 frei wählbar!
Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).

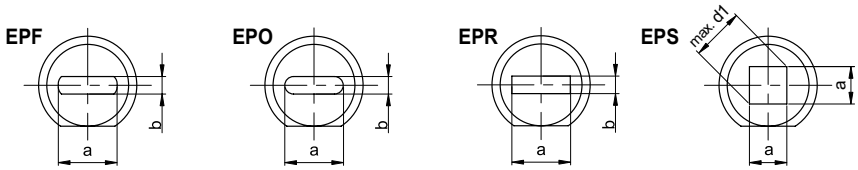
with spring ejector

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!
Punches without key flat available upon request.

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





d1 h6	a x b ±0,01 Stufung/step 0,01 ≥ ≤	d2	k -0,2	a +0,2	r	l2 -0,2	d4 +0,5	l1 +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	●	●	●	●	●

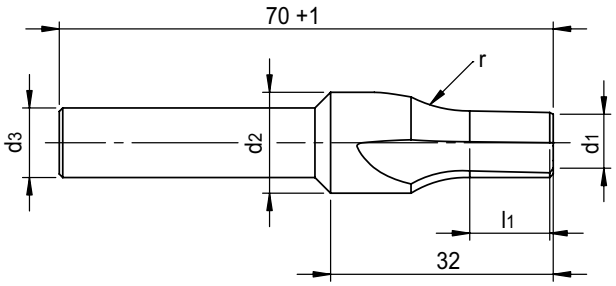
Zwischenabmessungen auf Anfrage! / Intermediate dimensions on request!

SE 020

Mat.: HSS
Härte Schaft: 64 ±2 HRC

Mat.: M2
Hardness shank: 64 ±2 HRC

SE 020 / 6,0



d1 f7	d2 h8	d3 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	26,5	16	15	15

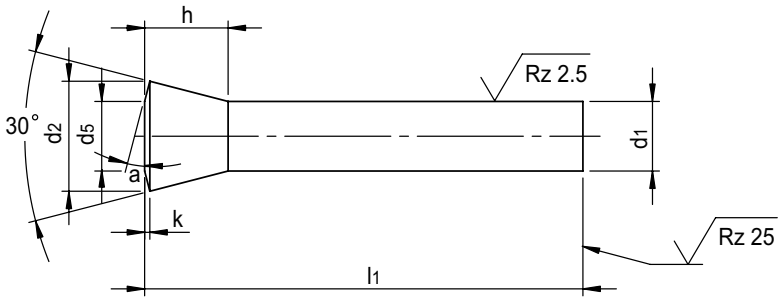
Zwischenabmessungen auf Anfrage! / Intermediate dimensions on request!

SE 730

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

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

SE 730 / 8 x 100



d1 h6	d2 -0,3	d5	h	k	a	l1 +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 732

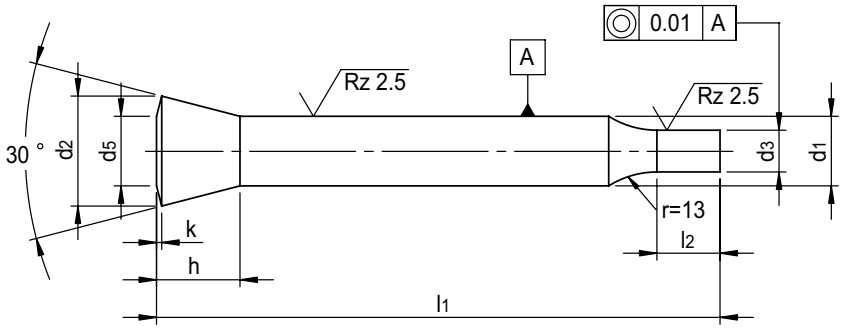
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

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

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

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

SE 732 / 6 x 100 / 5,5



d1 h6	d3 h6 Stufung/step 0,01	l2	d5	h	k	l1 +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	●	●	●	●	●

SE 733 . . .

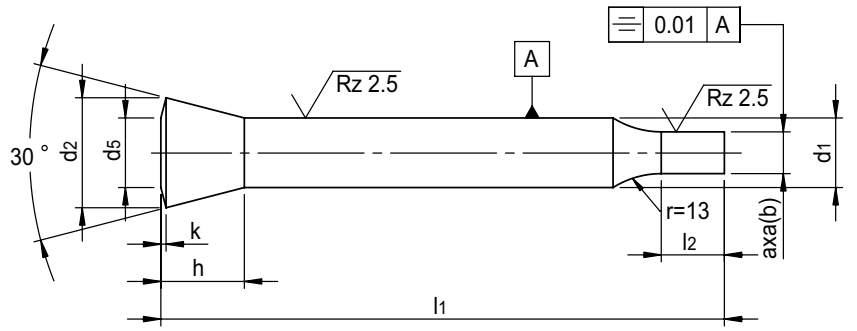
Mat.: HSS
Härte Schaft: 64 ±2 HRC
Kopf: 50 ±5 HRC

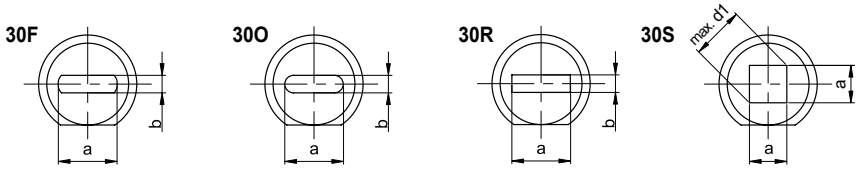
Länge l2 frei wählbar!
Stempel ohne Verdrehsicherung auf Wunsch lieferbar (bei Bestellung angeben).
Fehlende Maße siehe **SE 730** (Seite SE.23)

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 50 ±5 HRC

Length l2 freely selectable!
Punches without key flat available (upon request).
for missing dimensions please see **SE 730** (page SE.23)

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

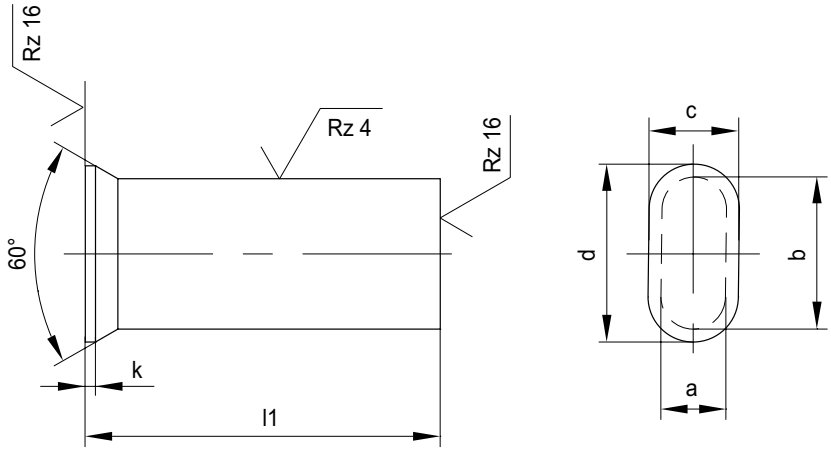




d1 h6	a x b ±0,01 Stufung/step 0,01 ≥ ≤	l2 +0,5	d5	h	k	l1 +1				
						71	80	90	100	120
4	**1,6 - 3,9**	10	3,8	6	1,0	●	●	●	●	
5	**2,5 - 4,9**	10	5,0	7	1,0	●	●	●	●	●
6	**3,0 - 5,9**	10	6,0	8	1,0	●	●	●	●	●
7	**3,0 - 6,9**	10	7,0	10	1,0	●	●	●	●	●
8	**4,0 - 7,9**	13	8,0	10	1,0	●	●	●	●	●
9	**4,5 - 8,9**	13	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	●	●	●	●	●

mit Senkkopf

with countersunk head



SE 744

Qualitätsausführung
Kopf und Schaft feinstgeschliffen
Kopf gestaucht

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

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

Kopfmaße können nach Ihren Angaben gefertigt werden!

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

Mat.: A2
Hardness shank: 62 ±2 HRC
Head: 45 ±5 HRC

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

Head-dimensions can be produced as per customers request!

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

SE 745

Qualitätsausführung
Kopf und Schaft feinstgeschliffen
Kopf gestaucht

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

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

Kopfmaße können nach Ihren Angaben gefertigt werden!

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

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 45 ±5 HRC

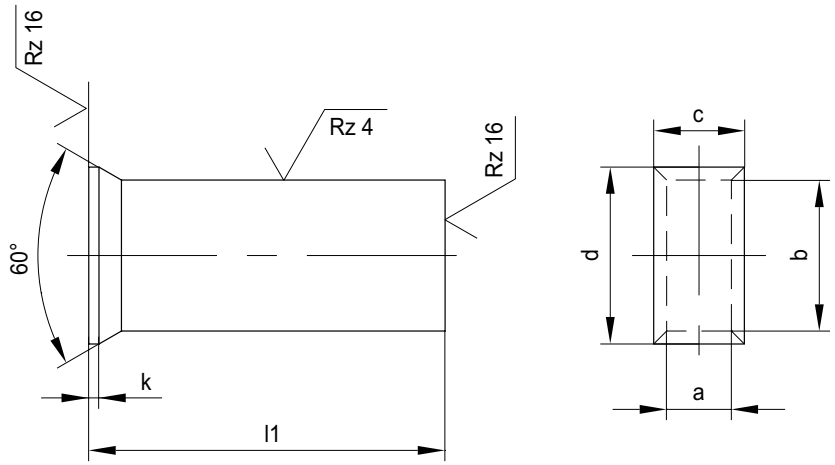
untoleranced
a/b: ±0,02
l: +0,5 / +1,0

Head-dimensions can be produced as per customers request!

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

mit Senkkopf

with countersunk head



SE 748

Qualitätsausführung
Kopf und Schaft feinstgeschliffen
Kopf gestaucht

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

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

Kopfmaße können nach Ihren Angaben gefertigt werden!

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

Mat.: A2
Hardness shank: 62 ±2 HRC
Head: 45 ±5 HRC

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

Head-dimensions can be produced as per customers request!

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

SE 749

Qualitätsausführung
Kopf und Schaft feinstgeschliffen
Kopf gestaucht

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

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

Kopfmaße können nach Ihren Angaben gefertigt werden!

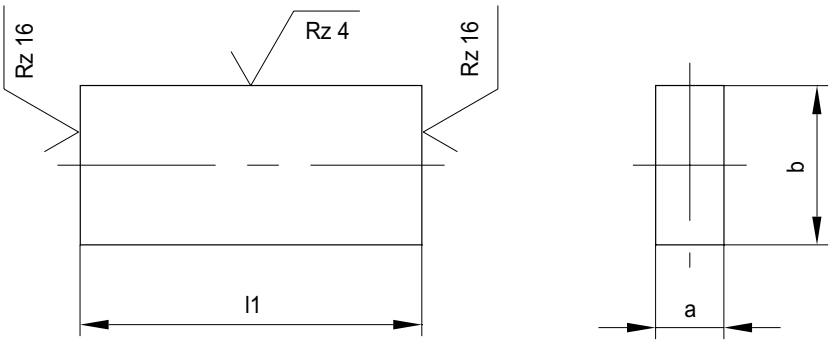
Grade A - finish
Head and shank finish-ground
Jolted head

Mat.: M2
Hardness shank: 64 ±2 HRC
Head: 45 ±5 HRC

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

Head-dimensions can be produced as per customers request!

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



SE 738

Mat.: HWS
Härte Schaft: 62 ±2 HRC

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

Mat.: A2
Hardness shank: 62 ±2 HRC

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

SE 738 / a x b x l1

SE 739

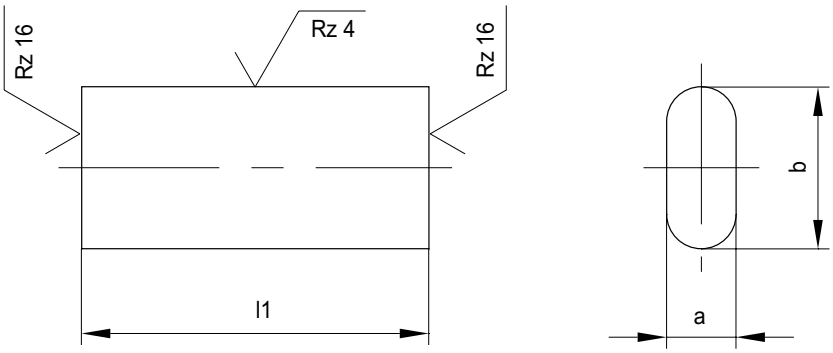
Mat.: HSS
Härte Schaft: 64 ±2 HRC

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

Mat.: M2
Hardness shank: 64 ±2 HRC

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

SE 739 / a x b x l1



SE 740

Mat.: HWS
Härte Schaft: 62 ±2 HRC

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

Mat.: A2
Hardness shank: 62 ±2 HRC

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

SE 740 / a x b x l1

SE 741

Mat.: HSS
Härte Schaft: 64 ±2 HRC

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

Mat.: M2
Hardness shank: 64 ±2 HRC

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

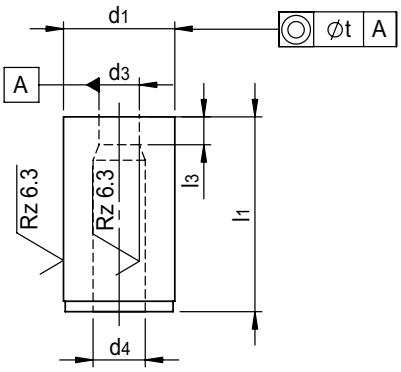
SE 741 / a x b x l1

SE 791

Mat.: HSS
Härte: 64 ±2 HRC

Mat.: M2
Hardness: 64 ±2 HRC

SE 791 / 3,0 x 28



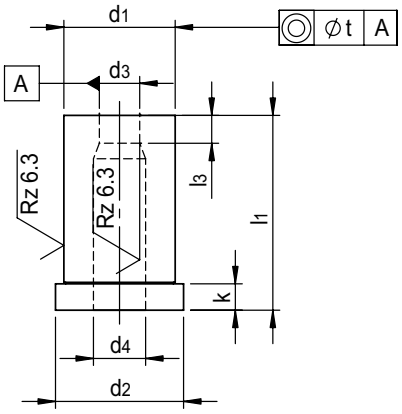
d3 H8	Stufung Graduation	d1 n6	d4	kurze Ausführung short version l1 +0,5	kurze Ausführung short version l3	lange Ausführung long version l1 +0,5	lange Ausführung long version l3	t
1,0	0,1	5	d3 + 0,3	**20**	2	**–**	–	0,01
1,1 - 2,0	0,1	6	d3 + 0,3	**20**	3	**28**	3	0,01
2,1 - 3,0	0,1	7	d3 + 0,5	**20**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

SE 792

Mat.: HSS
Härte: 64 ±2 HRC

Mat.: M2
Hardness: 64 ±2 HRC

SE 792 / 3,0 x 28



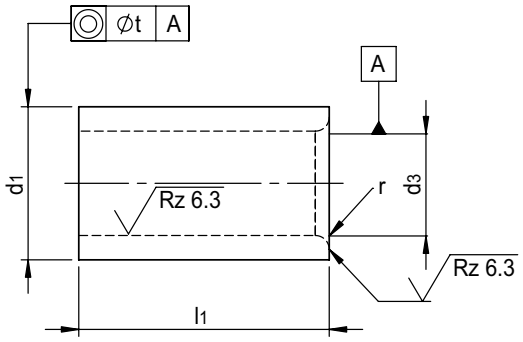
d3 H8	Stufung Graduation	d1 k6	d2	d4	kurze Ausführung short version l1 +0,5	l3	k	lange Ausführung long version l1 +0,5	l3	k	t
1,0	0,1	5	7	d3 + 0,3	**20**	2	4	**–**	–	–	0,01
1,1 - 2,0	0,1	6	8	d3 + 0,3	**20**	3	4	**28**	3	4	0,01
2,1 - 3,0	0,1	7	9	d3 + 0,5	**20**	3	4	**28**	3	4	0,01
3,1 - 4,0	0,1	8	10	d3 + 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 793

Mat.: Einsatzstahl
Härte: 62 ±2 HRC

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

SE 793 / 3,0



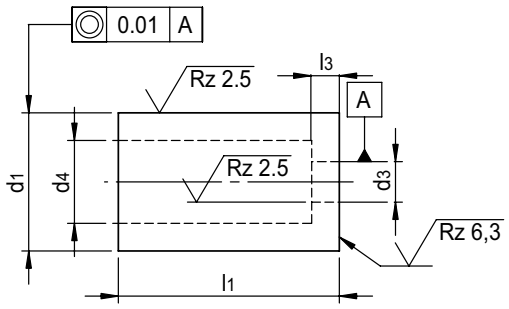
d3 H7	Stufung Graduation	d1 n6	l1	r	t
1,0	0,1	5	9	1,0	0,01
1,1-2,0	0,1	6	12	1,0	0,01
2,1-3,0	0,1	7	12	1,0	0,01
3,1-4,0	0,1	8	12	1,0	0,01
4,1-5,0	0,1	10	16	1,0	0,01
5,1-6,0	0,1	12	16	1,5	0,02
6,1-8,0	0,1	15	20	1,5	0,02
8,1-10,0	0,1	18	20	2,0	0,02
10,1-12,0	0,1	22	28	2,0	0,02
12,1-15,0	0,1	26	28	2,0	0,02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

SE 711 ED

Mat.: HSS
Härte: 64 ±2 HRC

Mat.: M2
Hardness: 64 ±2 HRC

SE 711 ED / 20 x 25 / 8,5



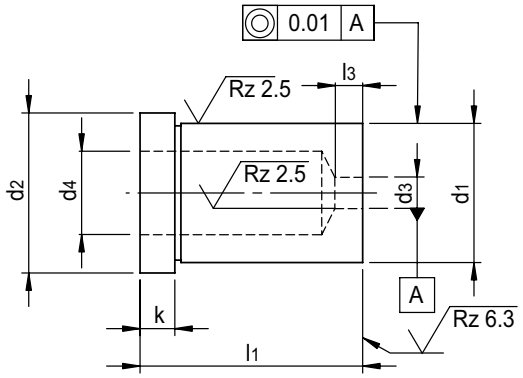
d1 m5	l3	d3 +0,02 Stufung/step 0,01	d4	l1 +0,5 16	19	20	22	25	28	30	32	35
5	2	**1,0-2,4**	2,8	●		●	●	●	●	●	●	●
6	3	**1,6-3,0**	3,5	●		●	●	●	●	●	●	●
8	4	**2,0-3,5**	4,0	●		●	●	●	●	●	●	●
10	4	**2,5-5,0**	5,8	●		●	●	●	●	●	●	●
13	5	**3,0-7,0**	8,0			●	●	●	●	●	●	●
16	5	**4,0-9,0**	9,5			●	●	●	●	●	●	●
19*	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 713 EKD

Mat.: HSS
Härte: 64 ±2 HRC

Mat.: M2
Hardness: 64 ±2 HRC

SE 713 EKD / 20 x 25 / 8,5



d1 m5	d2 +0,3	l3	k	d3 +0,02 Stufung/step 0,01	d4	l1 +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 . . .

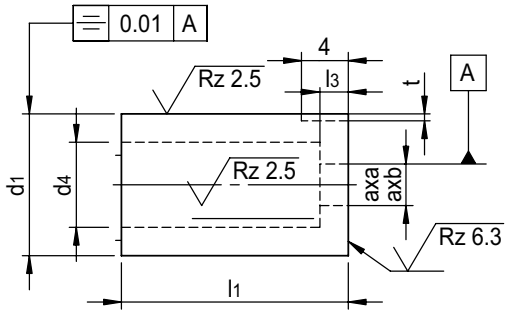
Mat.: HSS
Härte: 64 ±2 HRC

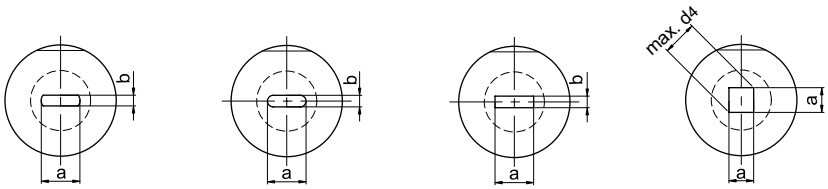
Mat.: M2
Hardness: 64 ±2 HRC

SE 715 EDF / 20 x 25 / a x b

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

Bushings without key flats available, please specify when ordering.





EDF **EDO** **EDR** **EDS**

d1 n5	a x b ±0,01 Stufung/step 0,01 ≥ ≤	l3	d4	t	l1 +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 . . . .

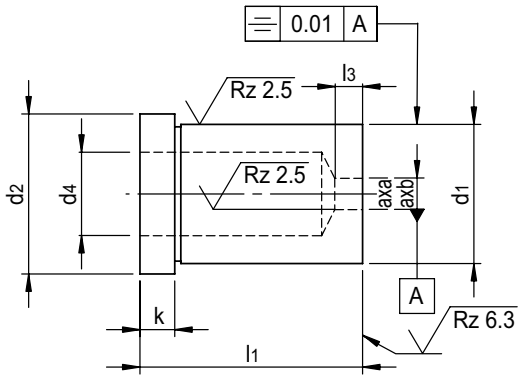
Mat.: HSS
Härte: 64 ±2 HRC

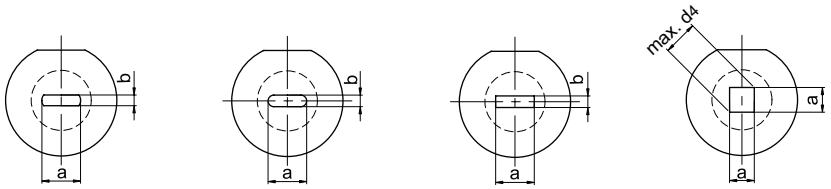
Mat.: M2
Hardness: 64 ±2 HRC

SE 717 EKDO / 20 x 25 / a x b

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

Bushings without key flats available, please specify when ordering.





EKDF **EKDO** **EKDR** **EKDS**

d1 m5	a x b ±0,01 Stufung/step 0,01 ≥ ≤	d2 +0,3	l3	k +0,25	d4	l1 +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

Mat.: HSS
Härte: 64 ±2 HRC

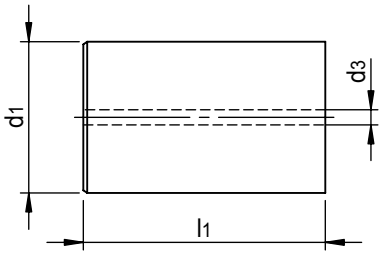
Andere Längen auf Wunsch lieferbar.

Type EDL, without collar

Mat.: M2
Hardness: 64 ±2 HRC

Other lengths available on request.

SE 711 EDL / 20 x 35



d1 n5	d3	l1 +0,5 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 713 EKDL

Type EKDL, mit Bund

Mat.: HSS
Härte: 64 ±2 HRC

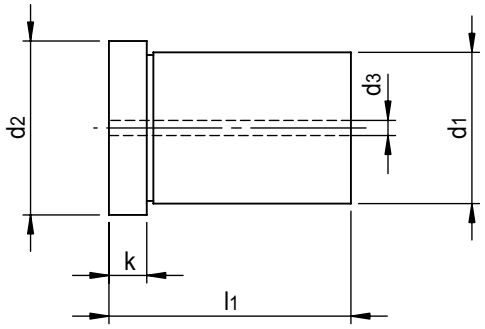
Andere Längen auf Wunsch lieferbar.

Type EKDL, with collar

Mat.: M2
Hardness: 64 ±2 HRC

Other lengths available on request.

SE 713 EKDL / 20 x 35



d1 m5	d2	d3	k +0,25	l1 +0,5 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

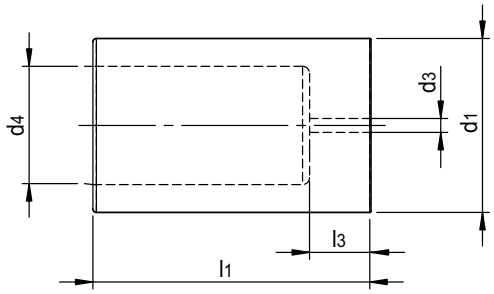
Type EDM, ohne Bund

Mat.: HSS
Härte: 64 ±2 HRC

Type EDM, without collar

Mat.: M2
Hardness: 64 ±2 HRC

SE 711 EDM / 20 x 35



d1 n5	d3	l3	d4	l1 +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 713 EKDM

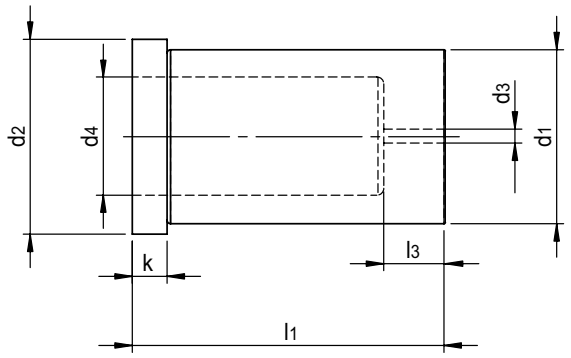
Type EKDM, mit Bund

Mat.: HSS
Härte: 64 ±2 HRC

Type EKDM, with collar

Mat.: M2
Hardness: 64 ±2 HRC

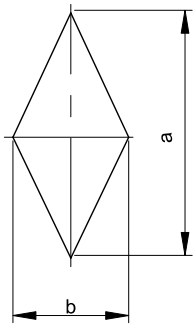
SE 713 EKDM / 20 x 35



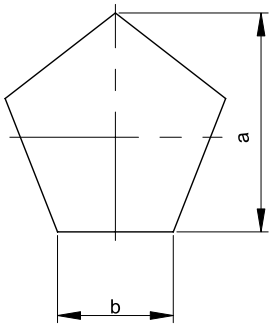
d1 m5	d3	d2 +0,3	l3	d4	k +0,25	l1 +0,5							
						16	20	22	25	28	30	32	35
5	**1,5**	8	2,0	2,8	5	●	●	●	●	●	●	●	●
6	**1,5**	9	3,0	3,5	5	●	●	●	●	●	●	●	●
8	**2,0**	11	4,0	4,0	5	●	●	●	●	●	●	●	●
10	**3,0**	13	4,0	5,8	5	●	●	●	●	●	●	●	●
13	**3,0**	16	5,0	8,0	5		●	●	●	●	●	●	●
16	**3,0**	19	5,0	9,5	5		●	●	●	●	●	●	●
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

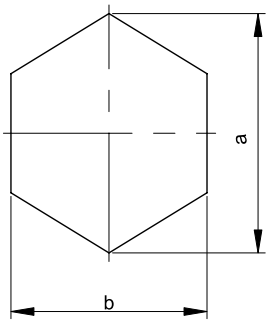
SP1



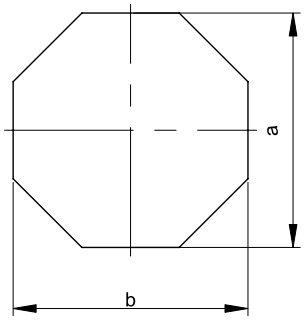
SP2



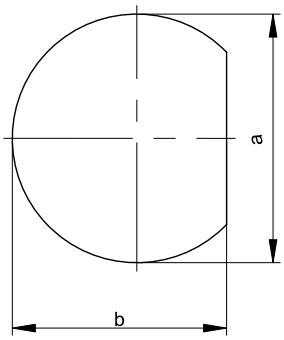
SP3



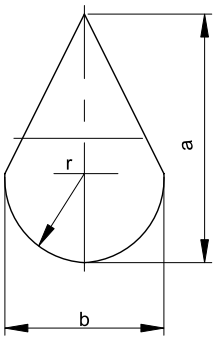
SP4



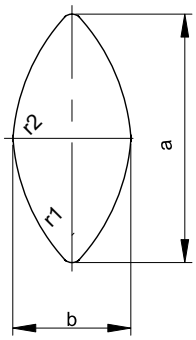
SP5



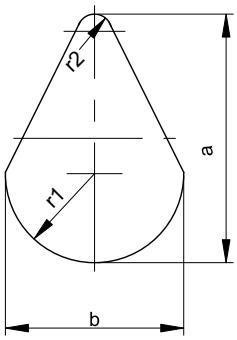
SP6



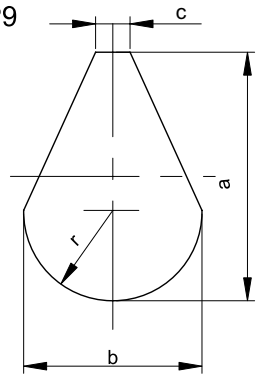
SP7



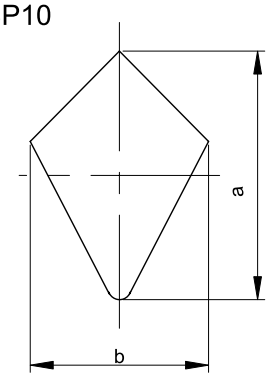
SP8



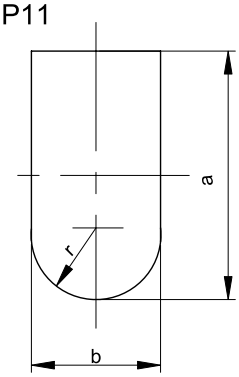
SP9



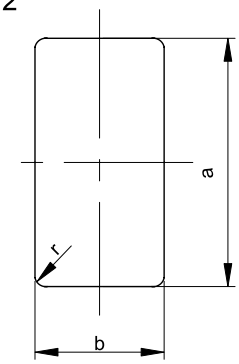
SP10



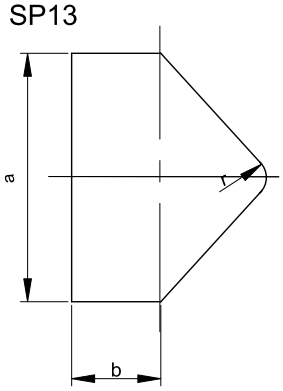
SP11



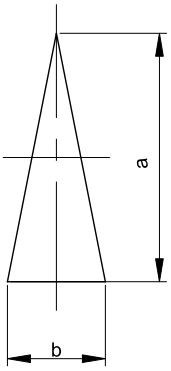
SP12



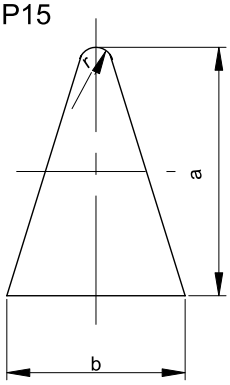
SP13



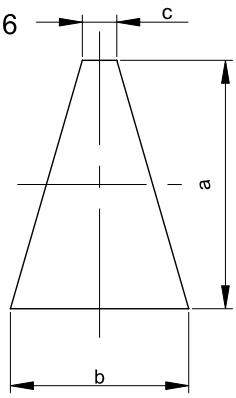
SP14



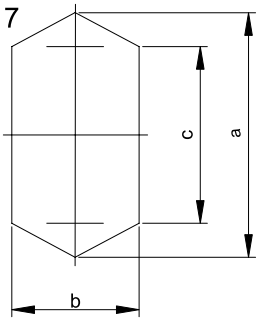
SP15



SP16



SP17



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Anfrage-Nr. Auftrags-Nr.

Material: Beschichtung:

Für Sonderausführungen erbitten wir eine Zeichnung!

Stückzahl:

Order-example Special Punches

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!

Quantity:

zertifiziert ISO 9001 for you Cert

MSPN GMBH

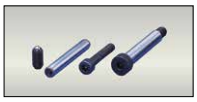
Märkische Stanz-Partner

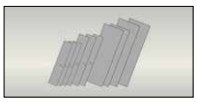
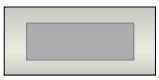
[**technische**Hilfsmittel]

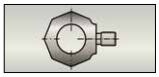
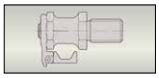
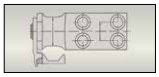
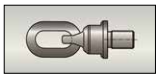
[**general**diecomponents]

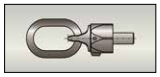
	Bohrbuchsen	Drill bushings	Best.-Nr. Order no.	Seite Page
	Bohrbuchsen mit Bund DIN 172, Form A	Drill bushings with collar DIN 172, Form A	TH 795	TH.2
	Bohrbuchsen ohne Bund DIN 179, Form A	Drill bushings without collar DIN 179, Form A	TH 794	TH.1

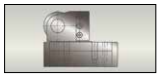
	Befestigungselemente, Zentrierhilfen, etc.	Mounting accessories, locators, ejectors, etc.	Best.-Nr. Order no.	Seite Page
	Auswerferstifte DIN 1530 Form D	Ejector pins DIN 1530 Form D	TH 751	TH.10
	Aufwerferstifte, gehärtet DIN 1530 A – ISO 6750	Ejector pins, hardened DIN 1530 A – ISO 6750	TH 750	TH.9
	Federnde Druckstücke mit Bolzen und Schlitz, Type B	Spring plungers with round ended bolt and slot, Type B	TH 330	TH.13
	Federnde Druckstücke mit Innensechskant und Bolzen, Type A	Spring plungers with round ended bolt and hexagon socket, Type A	TH 340	TH.14
	Federnde Druckstücke mit Kugel und Schlitz, Type K	Spring plungers with ball and with slot, Type K	TH 310	TH.11
	Federnde Druckstücke mit Kugel und Schlitz, Type KN	Spring plungers with ball and with slot, Type KN	TH 320	TH.12
	Federnde Druckstücke, lange Ausführung, Type L	Spring plungers, long version, Type L	TH 350	TH.15
	Gewindestifte mit Innensechskant DIN 913 / ISO 4026	Hexagon socket set screws DIN 913 / ISO 4026	TH 113	TH.8
	Handstempelgeräte, pneumatisch	Manual stamping tool, pneumatic	TH 930 TH 931 TH 932	TH.69 TH.70
	Norm-Prägewerke	Standard numbering heads	TH 936	TH.73
	Platinen-Einweiser	Pilot gages	TH 900 TH 900 CH	TH.36 TH.37
	Prägestempel-Einheit	Date stamp units	TH 926 TH 927	TH.67 TH.68
	Prägewerke	Numbering Heads	TH 933 TH 934 TH 935	TH.71 TH.72
	Schulterpassschrauben	Hexagon socket head shoulder screws	TH 413	TH.3
	Senkschrauben mit Innensechskant DIN 7991 / ISO 10642	Countersunk head screws with hexagon socket DIN 7991 / ISO 10642	TH 111	TH.5
	Zentriereinheiten mit Distanzscheibe	Tapered interlocks with spacer disk	TH 920 TH 921	TH.38 TH.39

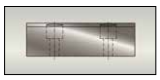
	**Befestigungselemente, Zentrierhilfen, etc.**	**Mounting accessories, locators, ejectors, etc.**	**Best.-Nr. Order no.**	**Seite Page**
	Zylinderschrauben mit Innensechskant DIN 912 / ISO 4762	Hexagon socket head cap screws DIN 912 / ISO 4762	TH 110	TH.4
	Zylinderstifte DIN EN 28734 Form A (DIN 6325)	Dowel pins DIN EN 28734 Form A (DIN 6325)	TH 700	TH.6
	Zylinderstifte mit Innengewinde ähnlich DIN EN ISO 8375	Dowel pins with internal thread similar DIN EN ISO 8375	TH 705	TH.7

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

	Tragelemente	**Lifting elements**	**Best.-Nr. Order no.**	**Seite Page**
	Einspannzapfen mit Gewindeschaft ähnlich DIN 9859, Form CE	Shanks with screwed shaft, similar DIN 9859, Form CE	TH 380	TH.22
	Lastböcke - drehbar, Standard/Vario	Hoist rings - rotatable; Standard / Vario	TH 56 R	TH.30
	Ringmuttern, hochfest	Lifting eye nuts, high-strength	TH 58 R	TH.28
	Ringschrauben - drehbar, STAR POINT	Eyebolts - rotatable, STAR POINT	TH 55 R	TH.29
	Ringschrauben, hochfest	Eyebolts, high-strength	TH 57 R	TH.27
	Tragschrauben	Lifting pins	TH 230	TH.25
	Tragschrauben mit Seilsicherung	Lifting pins with cable stop safety device	TH 230 TRY	TH.26
	Tragzapfen	Lifting brackets	TH 220	TH.23
	Tragzapfen mit Seilsicherung	Lifting brackets with cable stop safety device	TH 220 TRX	TH.24
	Wirbelböcke - Gewinde	Lifting points, threaded	TH 59 R	TH.32

	Tragelemente	**Lifting elements**	**Best.-Nr. Order no.**	**Seite Page**
	Wirbelböcke - Gewinde, Standard/Vario	Lifting points, threaded, Standard / Vario	TH 54 R	TH.31
	Wirbelböcke mit Ösenhaken, doppelt - kugelgelagert	Universal lifting points with eye hook, double ball bearing	TH 53 R	TH.33
	Wirbelböcke mit Ovalglied für direkten Kettenanschluss	Lifting points with oval ring for direct chain connection	TH 60 R TH 61 R	TH.34 TH.35

	Rollenschieber-Einheiten	**Cam-units**	**Best.-Nr. Order no.**	**Seite Page**
	Rollenschieber-Einheiten	Cam-units	NCC....	TH.40 - 52

	Teileförderer	**Part conveyors**	**Best.-Nr. Order no.**	**Seite Page**
	Teileförderer	Part conveyors	NCV....	TH.53 - 66
	Stützblock aus Teflon	Support blocks, teflon	NCVA.4	TH.59
	Stützelemente	Supports	NCVA....	TH.58

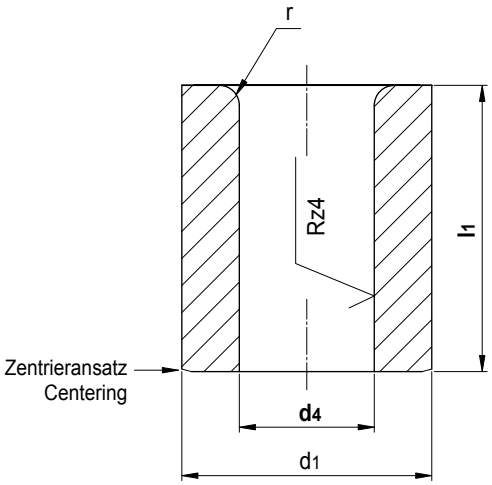
	Chemieprodukte	Chemical auxiliary products	Best.-Nr. Order no.	Seite Page
	Füge-Verbindungskleber	Adhesive	TH 017	TH.81
	Hochtemperatur Trenn- und Gleitmittel mit Cu	High-temperature release- and antiseize-agent with Cu	TH 015	TH.79
	Kaltentfetter	Cold degreaser	TH 010	TH.74
	Korrosionsschutz	Corrosion prevention	TH 012	TH.76
	Leckspray für Fluide	Leakage spray for fluids	TH 019	TH.83
	Rostlöser	Rust remover	TH 011	TH.75
	Schmierstoffpaste	Lubrication paste	TH 014	TH.78
	Schraubensicherung	Screw locking	TH 016	TH.80
	Sekundenkleber	Instant adhesive	TH 018	TH.82
	Sprühfett	Spray grease	TH 013	TH.77

TH 794

Härte: 740 +80HV10

Hardness: 740 +80HV10

TH 794 / 8,1 x 12



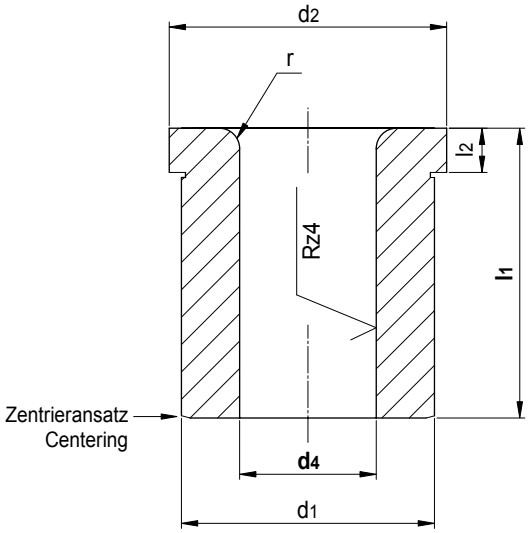
d4 F7	Stufung Graduation	l1 kurz / short	l1 mittel / medium	d1 n6	r
-1	0,1/0,25	**6**	**9**	3	1,0
1,1 - 1,8	0,1/0,25	**6**	**9**	4	1,0
1,9 - 2,6	0,1/0,25	**6**	**9**	5	1,0
2,7 - 3,3	0,1/0,25	**8**	**12**	6	1,0
3,4 - 4,0	0,1/0,25	**8**	**12**	7	1,0
4,1 - 5,0	0,1/0,25	**8**	**12**	8	1,0
5,1 - 6,0	0,1/0,25	**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 795

Härte: 740 +80HV10

Hardness: 740 +80HV10

TH 795 / 8,1 x 12



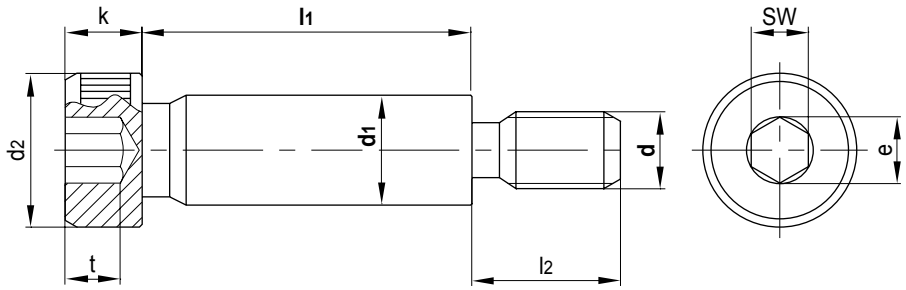
d4 F7	Stufung Graduation	l1 kurz / short	l1 mittel / medium	l2	d1 n6	d2	r
-1	0,1/0,25	**6**	**9**	2,0	3	6	1,0
1,1 - 1,8	0,1/0,25	**6**	**9**	2,0	4	7	1,0
1,9 - 2,6	0,1/0,25	**6**	**9**	2,0	5	8	1,0
2,7 - 3,3	0,1/0,25	**8**	**12**	2,5	6	9	1,0
3,4 - 4,0	0,1/0,25	**8**	**12**	2,5	7	10	1,0
4,1 - 5,0	0,1/0,25	**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 413

Mat.: Einsatzstahl
Festigkeitsklasse 12.9

Mat.: case-hardened steel
Property class 12.9

TH 413 / 10 x M8 x 40



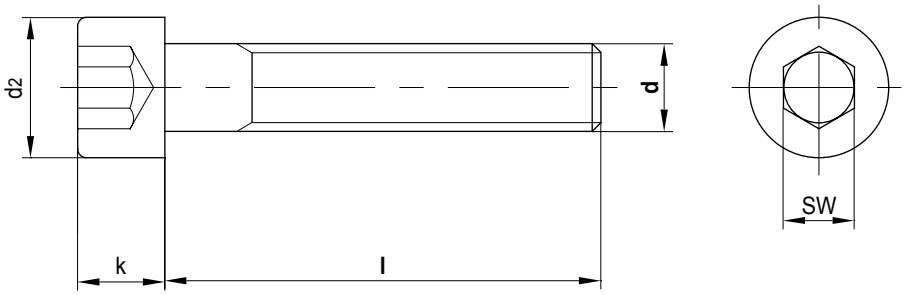
d1 h8	d	l2	d2	k	t	e	SW	l1 10	16	20	25	30	40	50	55	60	65	70	80	90	100	120
6	**M5**	9,5	10	4,5	2,4	3,6	3	●	●	●	●	●	●	●	●	●	●					
8	**M6**	11,0	13	5,5	3,3	4,7	4		●	●	●	●	●	●	●	●	●	●	●	●	●	
10	**M8**	13,0	16	7,0	4,1	5,9	5		●	●	●	●	●	●	●	●	●	●	●	●	●	
12	**M10**	16,0	18	9,0	4,9	7,0	6		●	●	●	●	●	●	●	●	●	●	●	●	●	●
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 110

Mat.: Einsatzstahl
Festigkeitsklasse 10.9

Mat.: case-hardened steel
Property class 10.9

TH 110 / M12 x 60



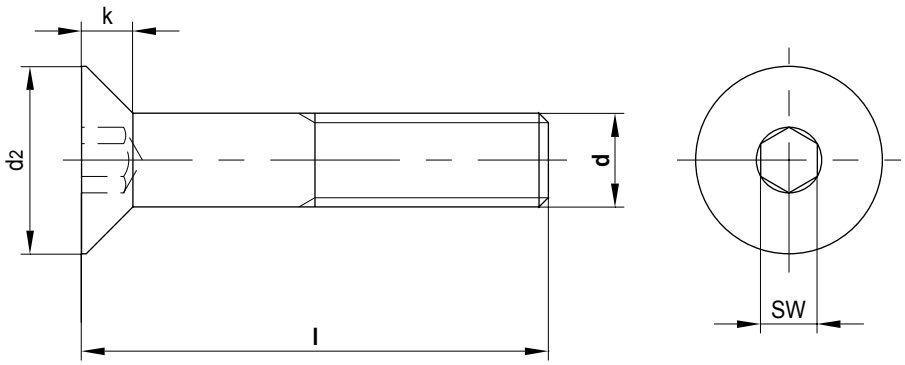
d	d2	k	SW	l																															
				10	12	16	20	25	30	35	40	45	50	55	60	65	70	75	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	240
M3	5,5	3	2,5	●	●	●	●	●																										
M4	7,0	4	3,0	●	●	●	●	●																										
M5	8,5	5	4,0	●	●	●	●	●	●	●	●	●	●	●	●																			
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



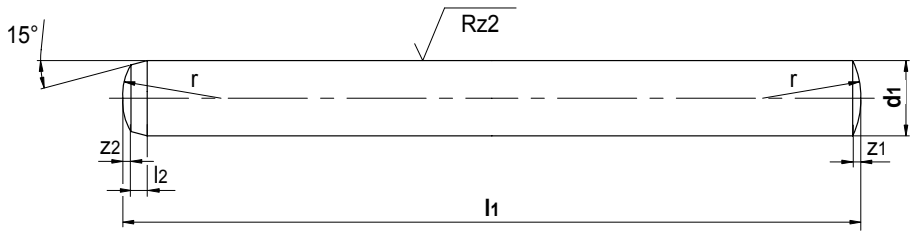
d	d2	k	SW	l							
				10	12	16	20	25	30	35	40
M3	6	1,7	2,0	●	●	●	●	●	●	●	●
M4	8	2,3	2,5	●	●	●	●	●	●	●	●
M5	10	2,8	3,0	●	●	●	●	●	●	●	●
M6	12	3,3	4,0	●	●	●	●	●	●	●	●
M8	16	4,4	5,0	●	●	●	●	●	●	●	●
M10	20	5,5	6,0	●	●	●	●	●	●	●	●

TH 700

Mat.: Einsatzstahl
Härte: 60 ±2 HRc

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

TH 700 / 5,0 x 12



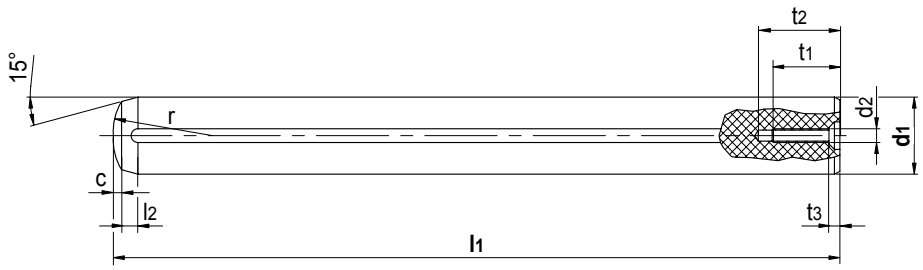
d1 m5	l2	r	z1	z2	l1 4	5	6	8	10	12	14	16	18	20	24	28	32	36	40	45	50	55	60	70	80	90	100
1,5	0,5	1,6	0,23	0,12	●	●	●	●	●	●	●	●															
2,0	0,6	2,0	0,30	0,18			●	●	●	●	●	●	●	●													
2,5	0,7	2,5	0,40	0,25			●	●	●	●	●	●	●	●	●												
3,0	0,8	3,0	0,45	0,30				●	●	●	●	●	●	●	●	●	●										
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 705

Mat.: Einsatzstahl
Härte: 60 ±2 HRc

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

TH 705 / 10 x 80



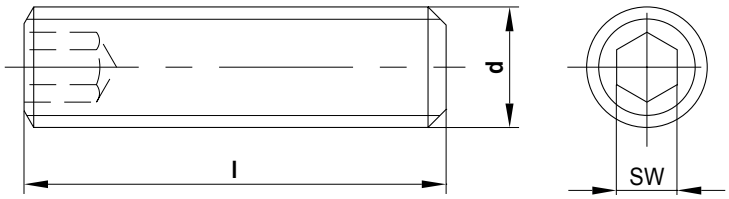
d1 m6	l2	r	c	d2	t1	t2	t3	l1 20	24	28	32	36	40	45	50	60	70	80	90	100
6	1,5	6	0,6	M4	6	10	1,0	●	●	●	●	●	●	●	●	●				
8	1,8	8	0,8	M5	8	13	1,2	●	●	●	●	●	●	●	●	●	●	●		
10	2,0	10	1,0	M6	10	16	1,2		●	●	●	●	●	●	●	●	●	●		
12	2,5	12	1,3	M6	12	18	1,2				●	●	●	●	●	●	●	●	●	●
14	2,5	14	1,3	M8	12	18	1,2				●	●	●	●	●	●		●		●
16	3,0	16	1,7	M8	16	23	1,6						●	●	●	●		●		●
20	4,0	20	2,0	M10	20	27	1,6								●	●		●		●

TH 113

Mat.: Einsatzstahl
Festigkeitsklasse 45H

Mat.: case-hardened steel
Property class 45H

TH 113 / M3 x 5



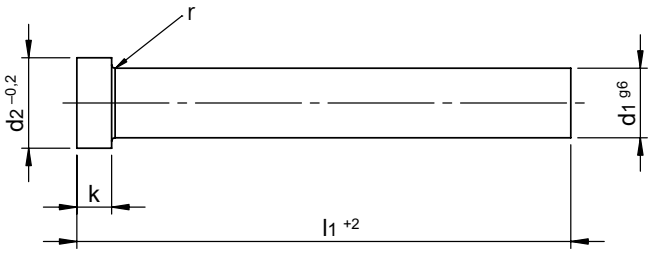
d	SW	l											
		5	6	8	10	12	16	20	25	30	35	40	50
M3	1,5	●	●	●	●		●						
M4	2,0	●	●	●	●	●	●	●					
M5	2,5	●	●	●	●	●	●	●	●				
M6	3,0		●	●	●	●	●	●	●	●		●	
M8	4,0			●	●	●	●	●	●	●			
M10	5,0				●	●	●	●	●	●	●	●	●
M12	6,0					●	●	●	●	●	●	●	●
M16	8,0						●	●	●	●	●	●	●

TH 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



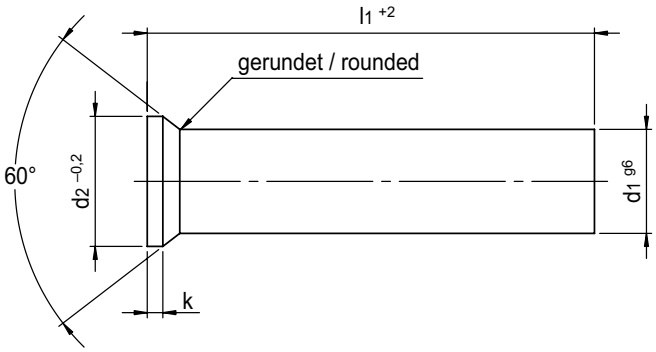
d1 g6	d2 -0,2	k	r	l1 +2 100	l1 +2 160
2	4	2	0,2	●	●
3	6	3	0,3	●	●
4	8	3	0,3	●	●
5	10	3	0,3	●	●
6	12	5	0,5	●	●
7	12	5	0,5	●	●
8	14	5	0,5	●	●
9	14	5	0,5	●	●
10	16	5	0,5	●	●
12	18	7	0,8	●	●
14	22	7	0,8	●	●
16	22	7	0,8	●	●

TH 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



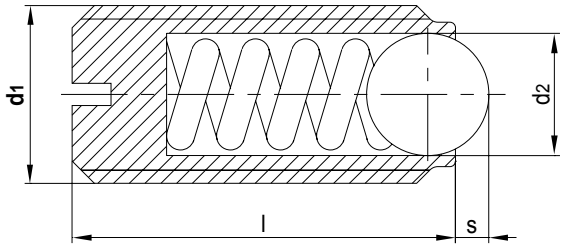
d1 g6	d2 -0,02	k	l1 +2 100	l1 +2 160
2,0	3,0	0,5	●	●
2,5	3,5	0,5	●	●
3,0	4,5	0,5	●	●
3,5	5,0	0,5	●	●
4,0	5,5	0,5	●	●
4,5	6,0	0,5	●	●
5,0	6,5	0,5	●	●
5,5	7,0	0,5	●	●
6,0	8,0	0,5	●	●
6,5	9,0	1,0	●	●
7,0	9,0	1,0	●	●
8,0	10,0	1,0	●	●
8,5	11,0	1,0	●	●
9,0	11,0	1,0	●	●
10,0	12,0	1,0	●	●
12,0	14,0	1,0	●	●
14,0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

TH 310

Mat.: Automatenstahl

Mat.: Free cutting steel

TH 310 / M4



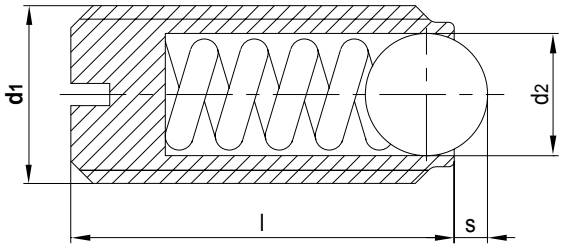
d1	l	s	d2	F1 N	Fmax. N
M4	9	0,8	2,5	8,5	14
M5	12	0,9	3,0	8,0	14
M6	14	1,0	3,5	11,0	18
M8	16	1,5	5,0	18,0	31
M10	19	2,0	6,0	24,0	45
M12	22	2,5	8,0	26,0	49
M16	24	3,5	10,0	41,0	86

TH 320

Mat.: nichtrostender Stahl
Hitzebeständigkeit bis 250 °C

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

TH 320 / M4



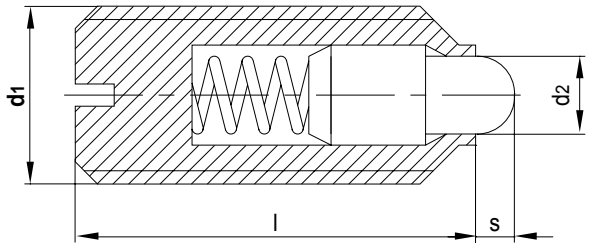
d1	l	s	d2	F1 N	Fmax. N
M4	9	0,8	2,5	8,5	14
M5	12	0,9	3,0	8,0	14
M6	14	1,0	3,5	11,0	18
M8	16	1,5	5,0	18,0	31
M10	19	2,0	6,0	24,0	45
M12	22	2,5	8,0	26,0	49
M16	24	3,5	10,0	41,0	86

TH 330

Mat.: Automatenstahl

Mat.: Free cutting steel

TH 330 / M8



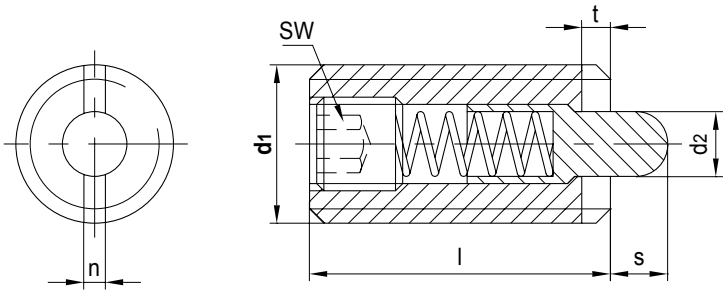
d_1	l	s	d_2	F_1 N	$F_{max.}$ N
M8	16	2,0	4,0	16	33
M10	19	2,5	4,5	19	42
M12	22	3,5	6,0	22	57
M16	24	4,5	8,5	38	78

TH 340

Mat.: Automatenstahl

Mat.: Free cutting steel

TH 340 / M4



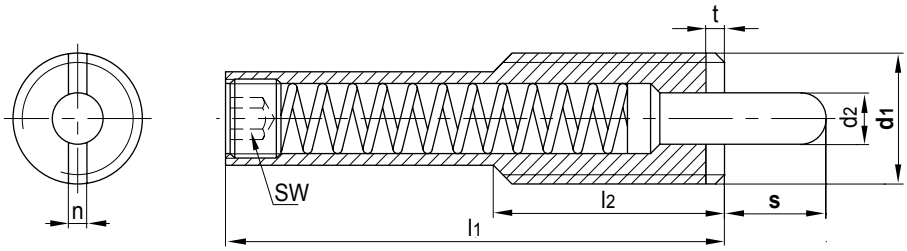
d1	l	s	d2	n	t	SW	F1 N	Fmax. N
M4	15	1,5	1,5	0,6	0,6	1,3	4,5	16
M5	18	2,3	2,4	1,2	0,8	1,5	6,0	19
M6	20	2,5	2,7	1,3	0,9	2,0	6,0	19
M8	22	3,0	3,5	1,5	1,4	2,5	10,0	39
M10	22	3,0	4,0	1,5	1,4	3,0	10,0	39
M12	28	4,0	6,0	2,7	2,0	4,0	12,0	53
M16	32	5,0	7,5	3,2	2,5	5,0	45,0	100

TH 350

Mat.: Automatenstahl

Mat.: Free cutting steel

TH 350 / M16 x 30

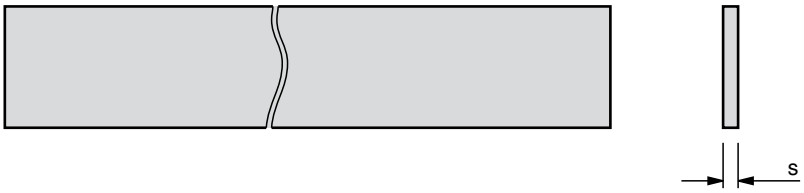


d1	d2	l1	l2	s	n	t	SW	F1 N	Fmax. N
M12	5,5	43	35	**10**	2,7	2,0	4	4	18
M16	7,5	60	35	**15**	3,2	2,5	5	7	24
M16	7,5	120	35	**30**	3,2	2,5	5	15	42

TH 422

Mat.:	1.1274	Mat.:	1.1274
Länge:	1000 mm	Length:	1000 mm
Breite:	12,7 mm	Width:	12,7 mm
Packungseinheit:	Rolle	Packaging unit:	Roll

TH 422 / 0,01



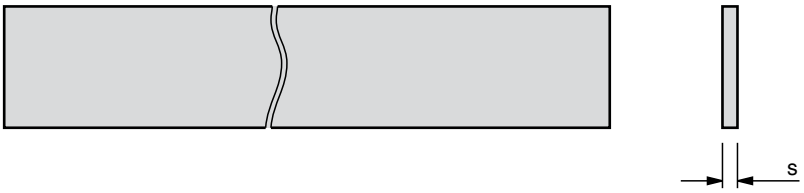
s	zulässige Zugfestigkeit allowed tensile strength [N/mm²]
0,01 ±0,002	2000-2200
0,02 ±0,002	2000-2200
0,03 ±0,002	2000-2200
0,04 ±0,003	2000-2200
0,05 ±0,003	2000-2200
0,06 ±0,003	2000-2200
0,07 ±0,004	2000-2200
0,08 ±0,004	2000-2200
0,09 ±0,004	2000-2200
0,10 ±0,004	2000-2200
0,12 ±0,004	2000-2200
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 allowed tensile strength [N/mm²]
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	Mat.:	1.1274
Länge:	5000 mm	Length:	5000 mm
Breite:	12,7 mm	Width:	12,7 mm
Packungseinheit:	Rolle	Packaging unit:	Roll

TH 423 / 0,01



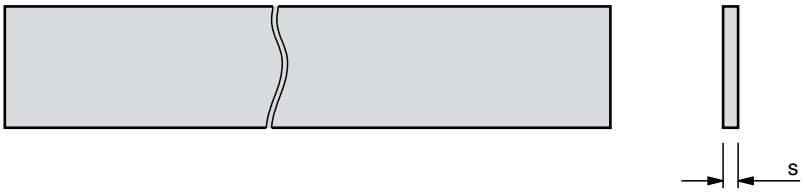
s	zulässige Zugfestigkeit allowed tensile strength [N/mm²]
0,01 ±0,002	2000-2200
0,02 ±0,002	2000-2200
0,03 ±0,002	2000-2200
0,04 ±0,003	2000-2200
0,05 ±0,003	2000-2200
0,06 ±0,003	2000-2200
0,07 ±0,004	2000-2200
0,08 ±0,004	2000-2200
0,09 ±0,004	2000-2200
0,10 ±0,004	2000-2200
0,12 ±0,004	2000-2200
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 allowed tensile strength [N/mm²]
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 424

Mat.:	1.1274	Mat.:	1.1274
Länge:	5000 mm	Length:	5000 mm
Breite:	50,0 mm	Width:	50,0 mm
Packungseinheit:	Rolle	Packaging unit:	Roll

TH 424 / 0,03



s	zulässige Zugfestigkeit allowed tensile strength [N/mm²]
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

s	zulässige Zugfestigkeit allowed tensile strength [N/mm²]
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
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 432

Mat.:	1.1274	Mat.:	1.1274
Länge:	300 mm	Length:	300 mm
Breite:	50,0 mm	Width:	50,0 mm
Packungseinheit:	10 Stück	Packaging unit:	10 pieces

TH 432 / 0,03

s	zulässige Zugfestigkeit allowed tensile strength [N/mm²]	s	zulässige Zugfestigkeit allowed tensile strength [N/mm²]
0,01 ±0,002	2000-2200	**0,25** ±0,007	1800-2000
0,02 ±0,002	2000-2200	**0,30** ±0,007	1800-2000
0,03 ±0,002	2000-2200	**0,40** ±0,009	1600-1800
0,04 ±0,003	2000-2200	**0,50** ±0,010	1600-1800
0,05 ±0,003	2000-2200	**0,60** ±0,010	1600-1800
0,06 ±0,003	2000-2200	**0,70** ±0,012	1400-1600
0,07 ±0,004	2000-2200	**0,80** ±0,013	1400-1600
0,08 ±0,004	2000-2200	**0,90** ±0,013	1400-1600
0,09 ±0,004	2000-2200	**1,00** ±0,013	1400-1600
0,10 ±0,004	2000-2200		
0,15 ±0,005	2000-2200		
0,20 ±0,006	1800-2000		

TH 433

Mat.:	1.4310	Mat.:	1.4310
Länge:	500 mm	Length:	500 mm
Breite:	100 mm	Width:	100 mm
Packungseinheit:	5 Stück	Packaging unit:	5 pieces

TH 433 / 0,02

s	zulässige Zugfestigkeit allowed tensile strength [N/mm²]
0,02 ±0,002	2000-2200
0,05 ±0,003	1850-2100
0,10 ±0,004	1600-1800
0,15 ±0,005	1600-1800
0,20 ±0,006	1600-1800
0,25 ±0,007	1600-1800
0,30 ±0,007	1600-1800
0,35 ±0,008	1600-1800
0,40 ±0,009	1600-1800
0,45 ±0,009	1600-1800
0,50 ±0,010	1600-1800
0,55 ±0,010	1600-1800

s	zulässige Zugfestigkeit allowed tensile strength [N/mm²]
0,60 ±0,010	1600-1800
0,65 ±0,010	1600-1800
0,70 ±0,012	1600-1800
0,75 ±0,012	1600-1800
0,80 ±0,013	1600-1800
0,85 ±0,013	1600-1800
0,90 ±0,013	1600-1800
0,95 ±0,013	1600-1800
1,00 ±0,013	1600-1800

TH 434

TH 434 / 1

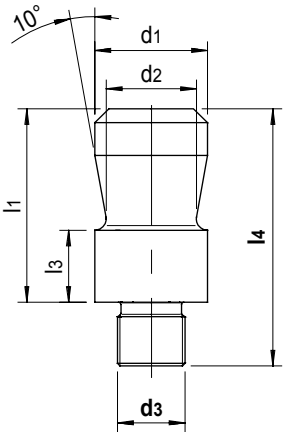
Type	Format	Anzahl Blätter Number of sheets	Inhalt: je 1 Blatt Content: 1 sheet each	Mat.
1	50 x 300	25	s = 0,01 - 1,00 mm	1.1274
2	100 x 500	9	s = 0,02 / 0,05 / 0,10 / 0,15 / 0,20 / 0,30 / 0,40 / 0,50 / 1,00 mm	1.4310

TH 380

Mat.: C45

Mat.: C45

TH 380 / M16 x 1,5 x 58



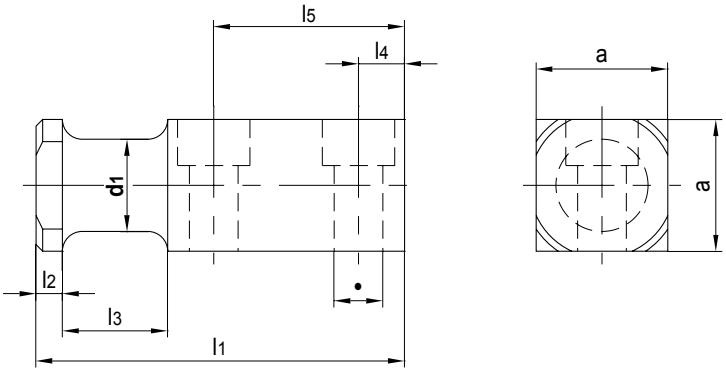
d3	d1 d9	d2	l1	l3	l4
M16 x 1,5	20	15	40	12	**58**
M16 x 1,5	25	20	45	16	**68**
M20 x 1,5	25	20	45	16	**68**
M20 x 1,5	32	25	56	16	**79**
M24 x 1,5	32	25	56	16	**79**
M24 x 1,5	40	32	70	26	**93**
M30 x 2,0	40	32	70	26	**93**
M30 x 2,0	50	42	80	26	**108**

TH 220

Mat.: C45

Mat.: C45

TH 220 / 20



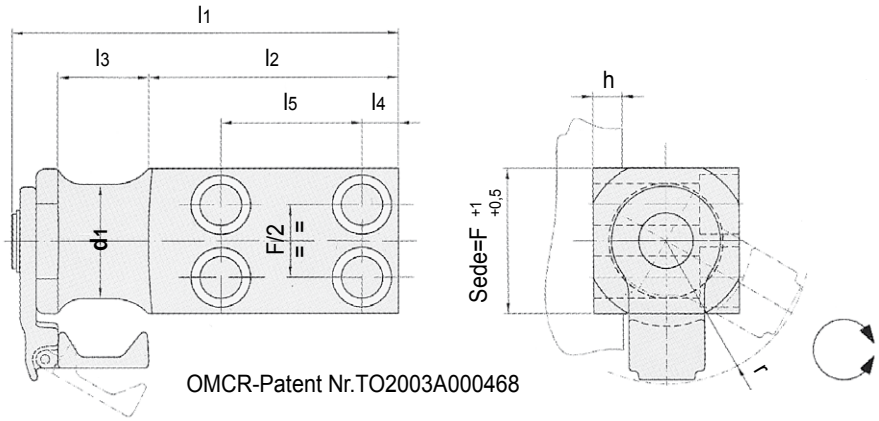
d1	Tragfähigkeit Lifting capacity [N]	• DIN 912 min. 8.8	l1	l2	l3	l4	l5	a
16	3200	M8 x 30	80	6	20	10	44	20
20	6300	M10 x 35	90	8	25	10	47	25
25	12500	M12 x 40	100	8	30	12	50	35
32	20000	M16 x 55	120	10	32	16	62	40
40	32000	M20 x 70	140	10	40	18	72	50

TH 220 TRX

Schraubenposition:
2 Stck. auf der Mittellinie
4 Stck. wie in Zeichnung dargestellt

Position of screws:
twice on center - line
4 x, as shown in drawing

TH 220 TRX / 20



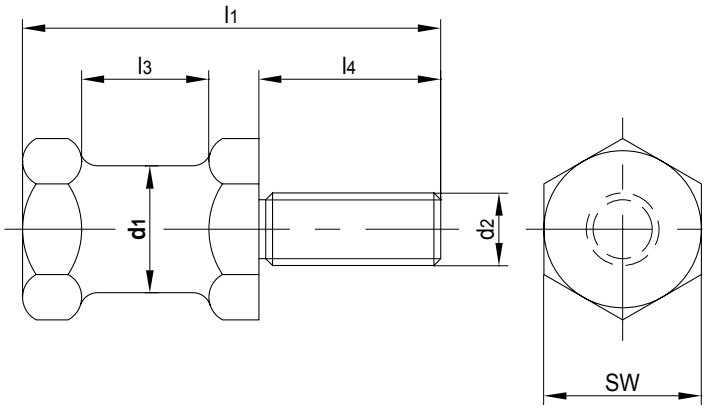
d1	Tragfähigkeit Lifting capacity [N]	l1	l2	l3	l4	l5	F	h	r	Anzahl Schrauben Number **of screws**	M
20	6300	99,0	57	25	10	37	25	8	36	2	10x30
25	12500	112,5	62	30	12	38	35	10	48	2	12x40
32	20000	132,5	78	32	16	46	40	10	52	2	16x45
40	32000	152,5	90	40	18	54	50	12	60	2	20x60
50	50000	173,0	103	45	22	59	60	14	66	2	24x70
63	80000	213,5	138	50	20	78	80	16	80	4	20x85

TH 230

Mat.: C45

Mat.: C45

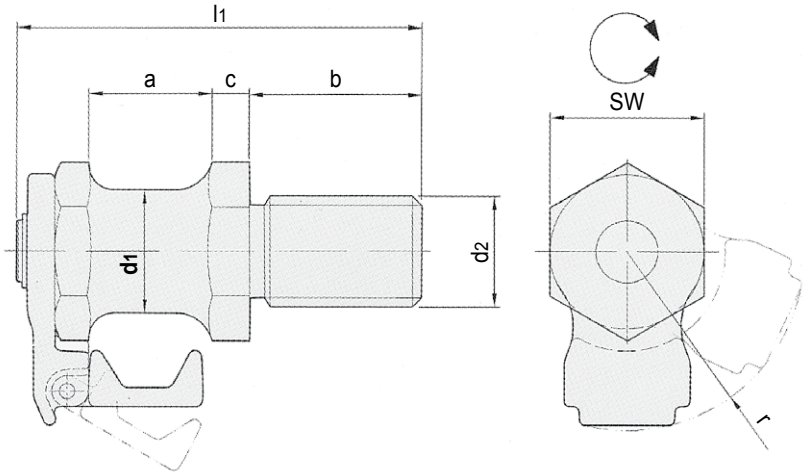
TH 230 / 20



d1	Tragfähigkeit Lifting capacity [N]	d2	l1	l3	l4	SW
16	3200	M16	55	20	20	24
20	5000	M20	68	20	32	30
25	10000	M24	78	25	38	36
32	15000	M30	95	32	45	41
40	25000	M36	118	40	56	50

TH 230 TRY

TH 230 TRY / 20



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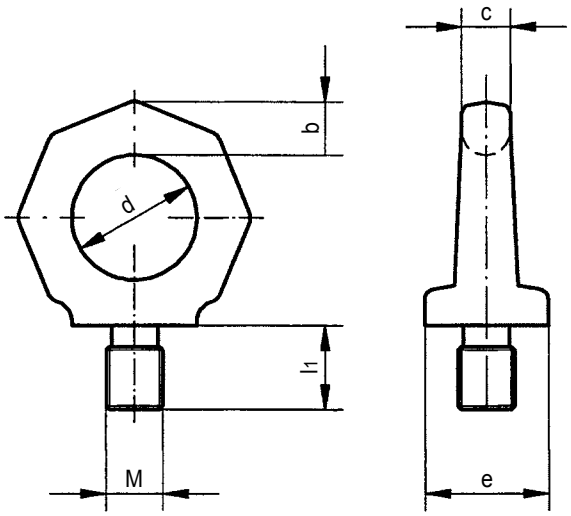
d1	Tragfähigkeit Lifting capacity [N]	d2	a	b	c	l1	r	SW
20	5000	M20	22	34	6,5	80	38	30
25	10000	M24	25	38	8,0	93	42	36
32	15000	M30	32	45	10,0	110	50	41
40	25000	M36	40	56	12,0	132	57	50

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] Lifting capacity [t]		l1	b	c	d	e
	G	G					
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

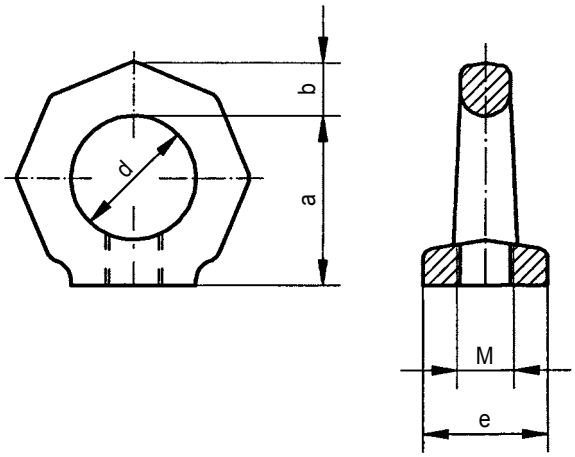
Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weigth „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

TH 58 R

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

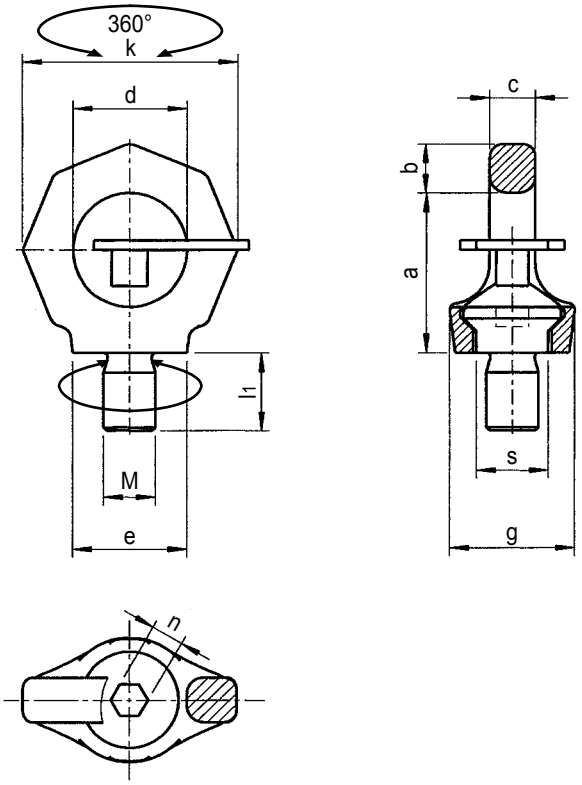
Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weigth „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

TH 55 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 58 R / M36



M	Tragfähigkeit [t] Lifting capacity [t]		a	b	c	d	e	g	k	l1	n	s
	G	G										
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 weigth „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

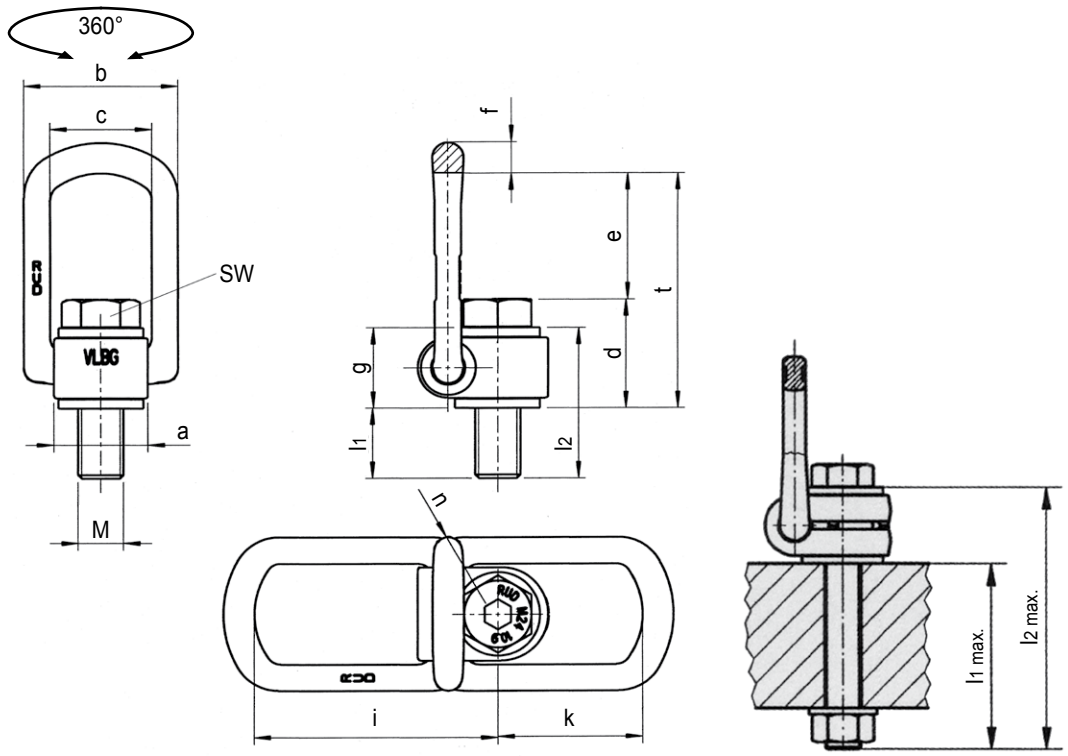
TH 56 R

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.



M	Tragfähigkeit [t] Lifting capacity [t]		a	b	c	d	e	f	g	l1 Standard	l1 Vario	i	k	l2 Standard	l2 Vario	n	SW	t	Anzugsmoment Fastening torque
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 weigth „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

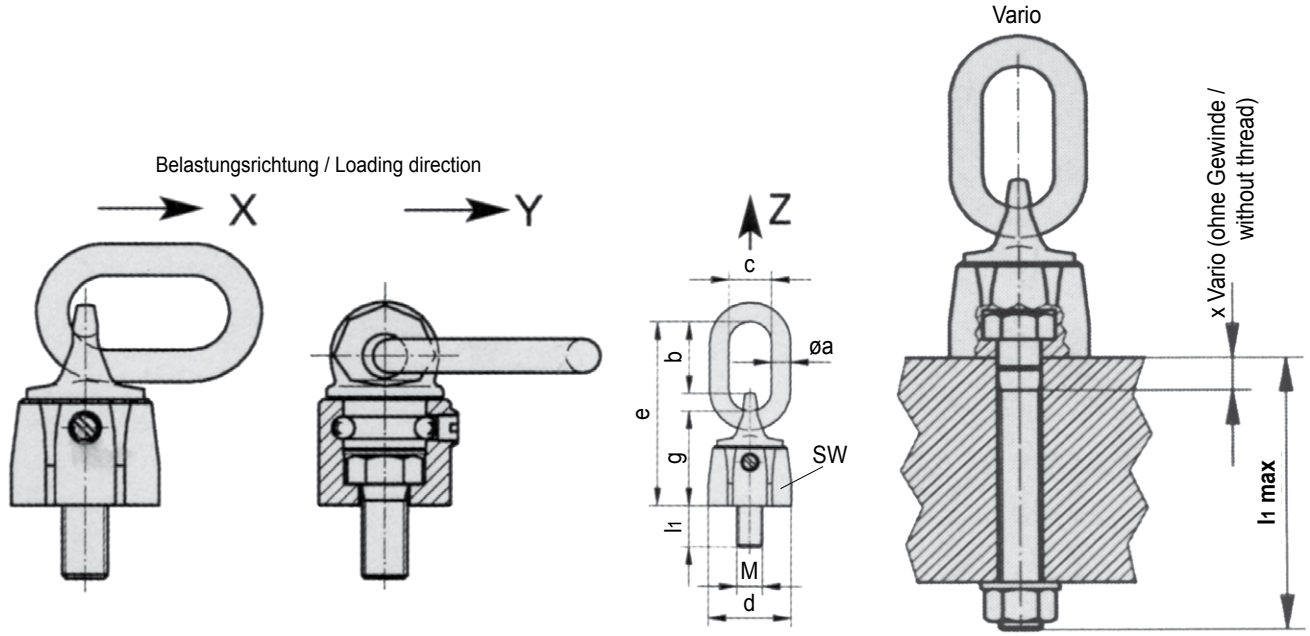
TH 54 R

Kugelgelagert unter Last 360° drehbar. Allseitig belastbar bei vierfacher Sicherheit. Nicht unter Volllast 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] Lifting capacity [t]		a	b	c	d	e	l1 Standard	l1 Vario	g	SW	x Vario
	G	G										
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 weigth „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

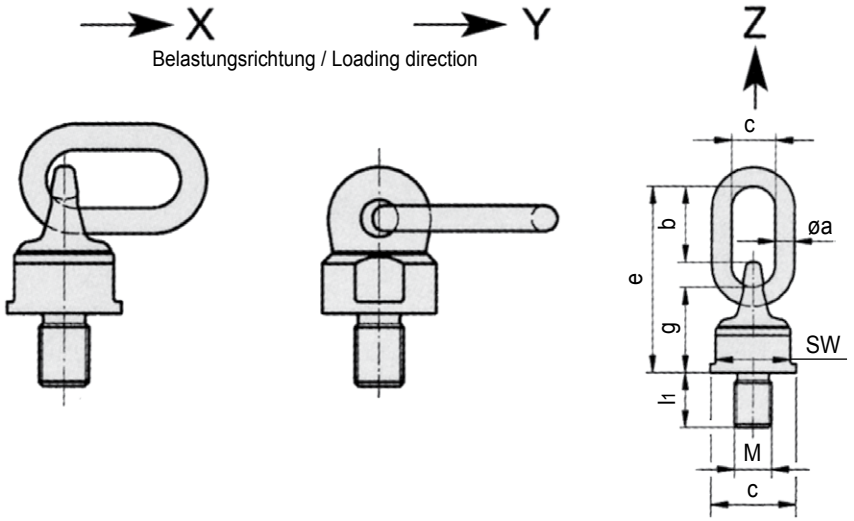
TH 59 R

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



M	Tragfähigkeit [t] Lifting capacity [t]		a	b	c	d	e	l1	g	SW
	G	G								
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

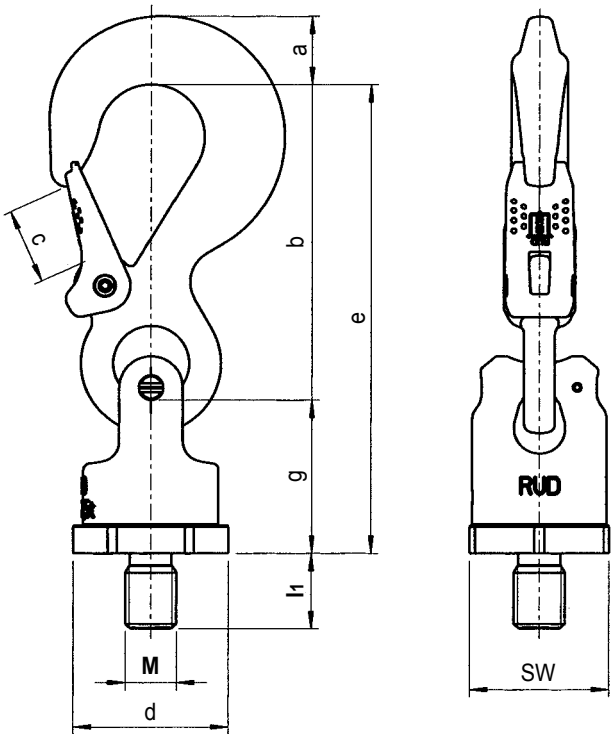
Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weigth „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

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 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.

TH 53 R / M24

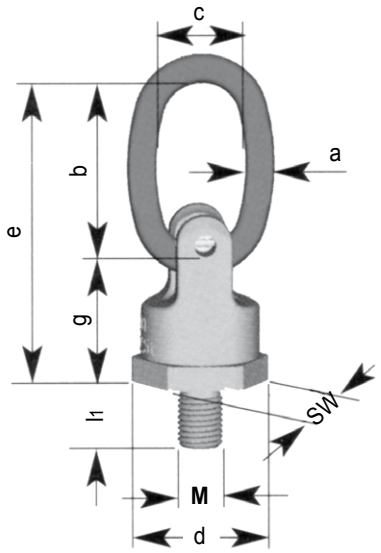


M	Tragfähigkeit [t] Lifting capacity [t]		a	b	c	d	e	l1	g	SW
	G	G								
M16	1,5	1,5	20	97	25	46	147	25	50	41
M20	2,5	2,5	28	126	30	61	187	30	61	55
M24	4,0	4,0	36	150	35	78	227	36	77	70
M30	6,5	6,5	37	174	40	95	267	45	93	85
M36	8,0	8,0	49	208	48	100	310	54	102	90

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

TH 60 R

TH 60 R / M20



M	Tragfähigkeit [t] Lifting capacity [t]		a	b	c	d	e	l1	g	SW
	G	G								
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

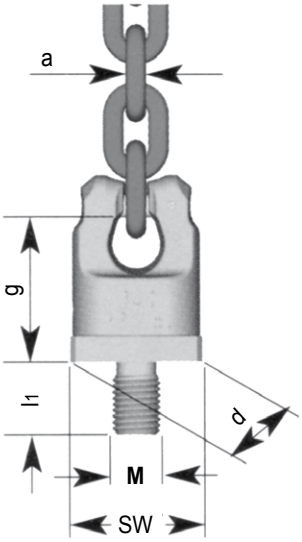
Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weigth „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

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] Lifting capacity [t]		Kettenanschluss a Chain connection a	d	l1	g	SW
	G	G					
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

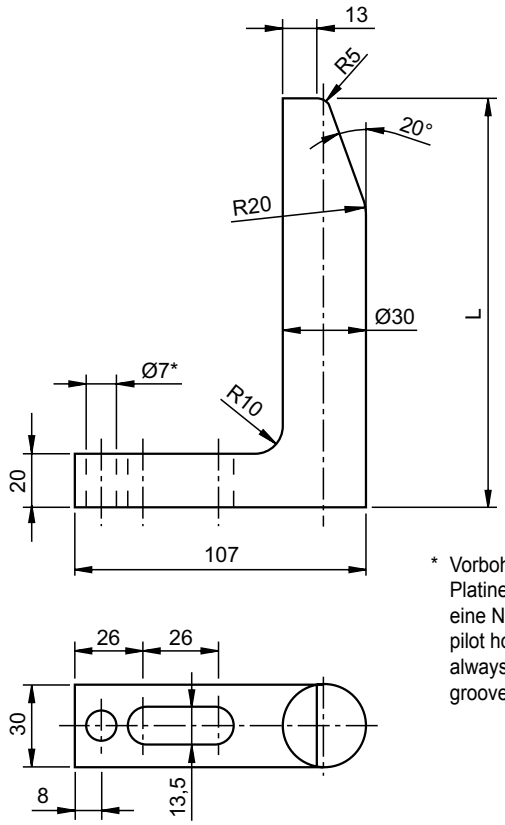
Transportgewicht „G“ in „t“ bei verschiedenen Anschlagsarten. / Transport weigth „G“ in „t“ under various lifting conditions (t = Tonnen / tons)

TH 900

Mat.: CK 15

Mat.: CK 15

TH 900 / 090



* Vorbohrung für Zylinderstift Platinen-Einweiser immer in eine Nut einsetzen. / pilot hole for dowel pin … always place pilot gage into groove

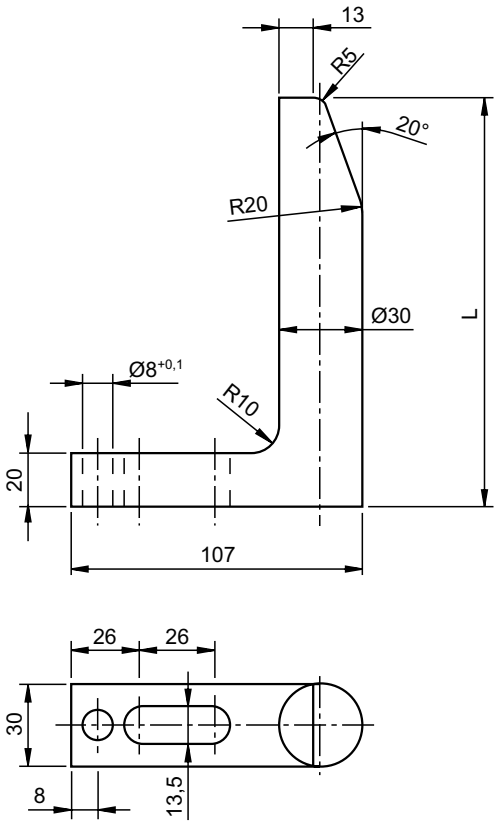
Type	L
065	65
090	90
120	120
150	150
180	180
250	250

TH 900 ... CH

Mat.: C 60, gegossen induktiv gehärtet
Härte: 56 +4 HRC

Mat.: C 60, casted inductively hardened
Hardness: 56 +4 HRC

TH 900 / 065 / CH



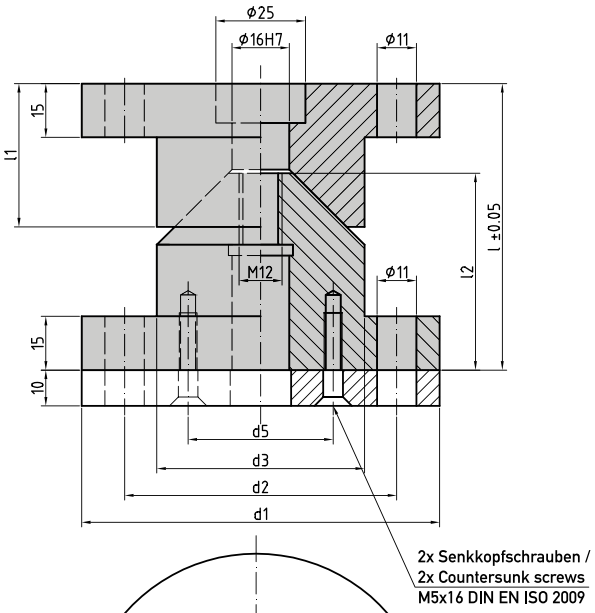
Type	L
065 / CH	65
090 / CH	90
120 / CH	120
150 / CH	150
180 / CH	180
250 / CH	250

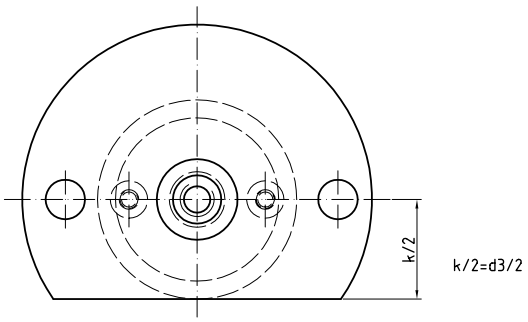
TH 920 / .

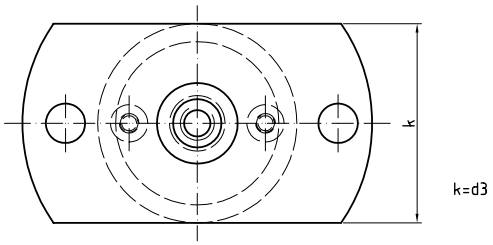
Mat.: 16 Mn Cr 5
Randschichthärte: 60 +4 HRC

Mat.: 16 Mn Cr 5
Surface hardness: 60 +4 HRC

TH 920 / 1 x 100







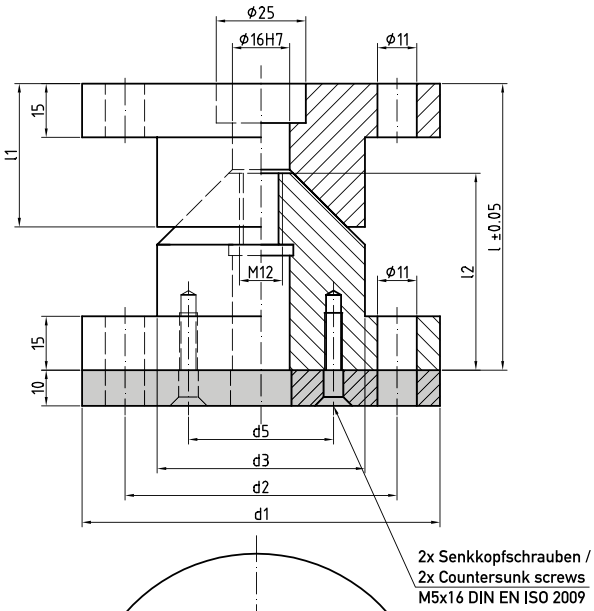
Type	Beschreibung / Description	d1	d2	d3	d5	l	l1	l2
1	mit Distanzscheibe	**100**	76	58	40,5	80	40	55
	with spacer disk	**120**	96	78	50,5	90	50	63
2	ohne Distanzscheibe	**100**	76	58	40,5	80	40	55
	without spacer disk	**120**	96	78	50,5	90	50	63
3	mit Distanzscheibe und einseitiger Fläche	**100**	76	58	40,5	80	40	55
	with spacer disk and one-sided flat	**120**	96	78	50,5	90	50	63
4	ohne Distanzscheibe und einseitiger Fläche	**100**	76	58	40,5	80	40	55
	withou spacer disk and one-sided flat	**120**	96	78	50,5	90	50	63
5	mit Distanzscheibe und beidseitiger Fläche	**100**	76	58	40,5	80	40	55
	with spacer disk and double-sided flat	**120**	96	78	50,5	90	50	63
6	ohne Distanzscheibe und beidseitiger Fläche	**100**	76	58	40,5	80	40	55
	withou spacer disk and double-sided flat	**120**	96	78	50,5	90	50	63

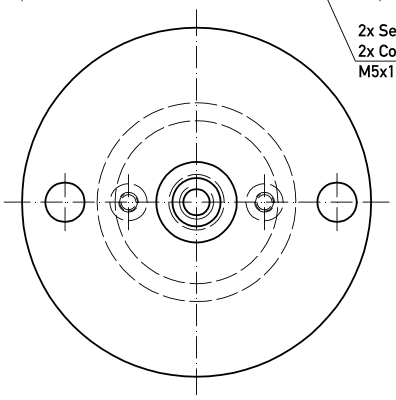
TH 921 / .

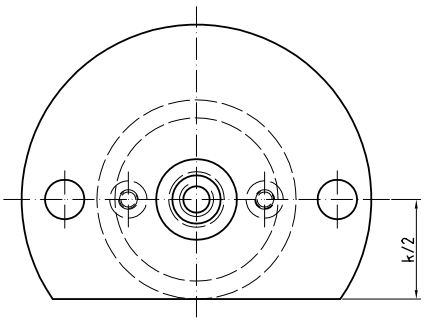
Mat.: 1.7131

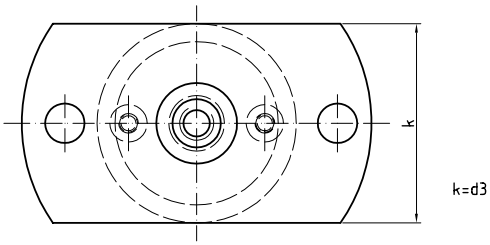
Mat.: 1.7131

TH 921 / 1 x 100









Type	Beschreibung / Description	d1	d2	d3	d5	l	l1	l2
1	rund	**100**	76	58	40,5	80	40	55
	round	**120**	96	78	50,5	90	50	63
2	mit einseitiger Fläche	**100**	76	58	40,5	80	40	55
	with one-sided flat	**120**	96	78	50,5	90	50	63
3	mit beidseitiger Fläche	**100**	76	58	40,5	80	40	55
	with double-sided flat	**120**	96	78	50,5	90	50	63

INFO

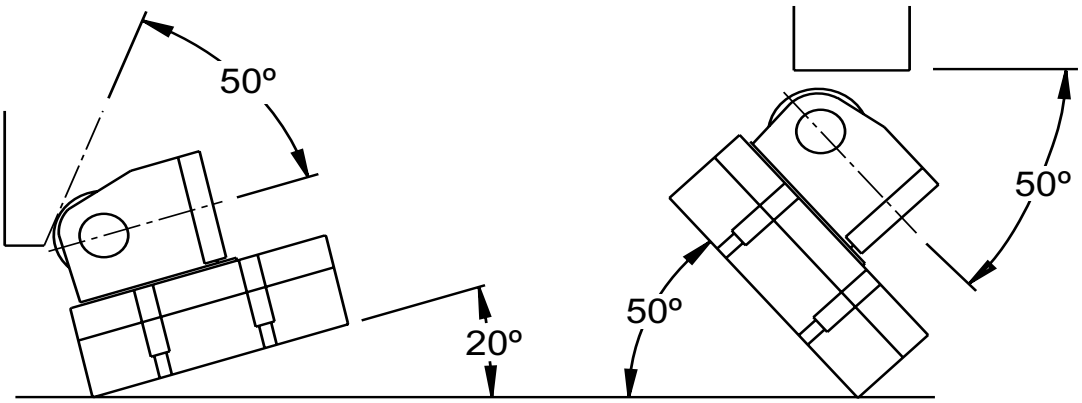
NCC. . .

Produktmerkmale/Anwendung:
- Montageplatte „seitlich“ verschraubt
- größere Befestigungsfläche
- Führungsleisten selbstschmierend
- Rückstellung durch Gasdruckfe-dern
- 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!

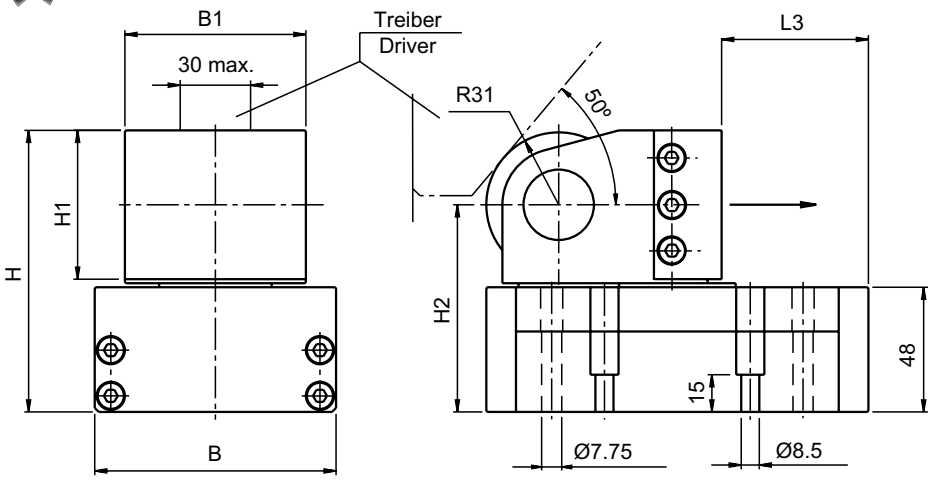
NCC.2.1

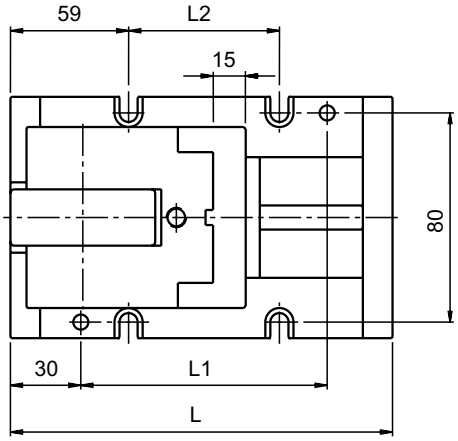
INFO TH.40

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern 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

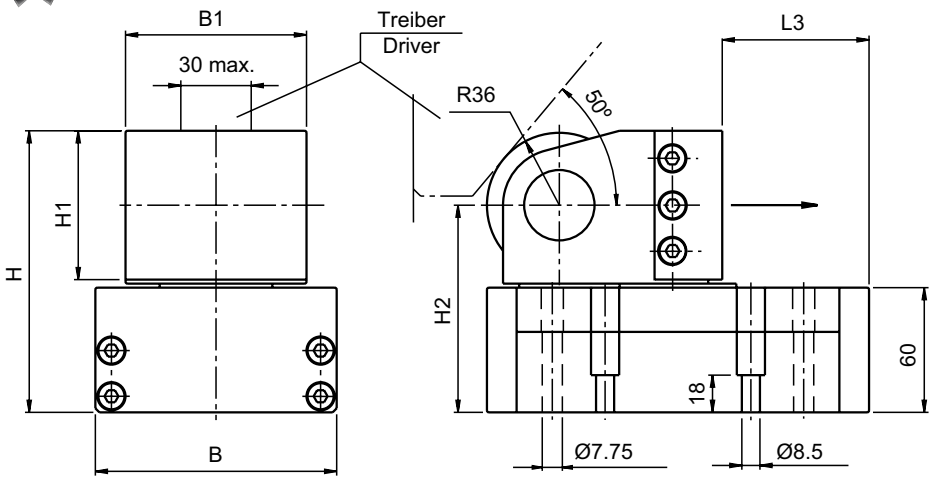
NCC.2.2

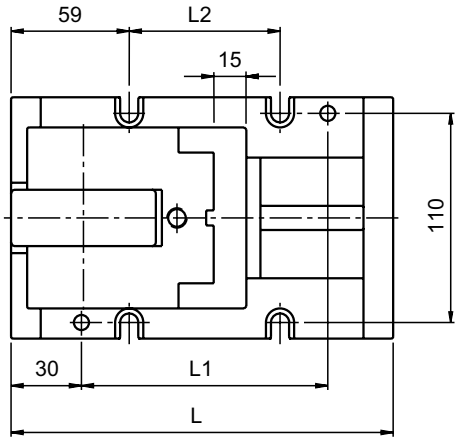
INFO TH.40

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern 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

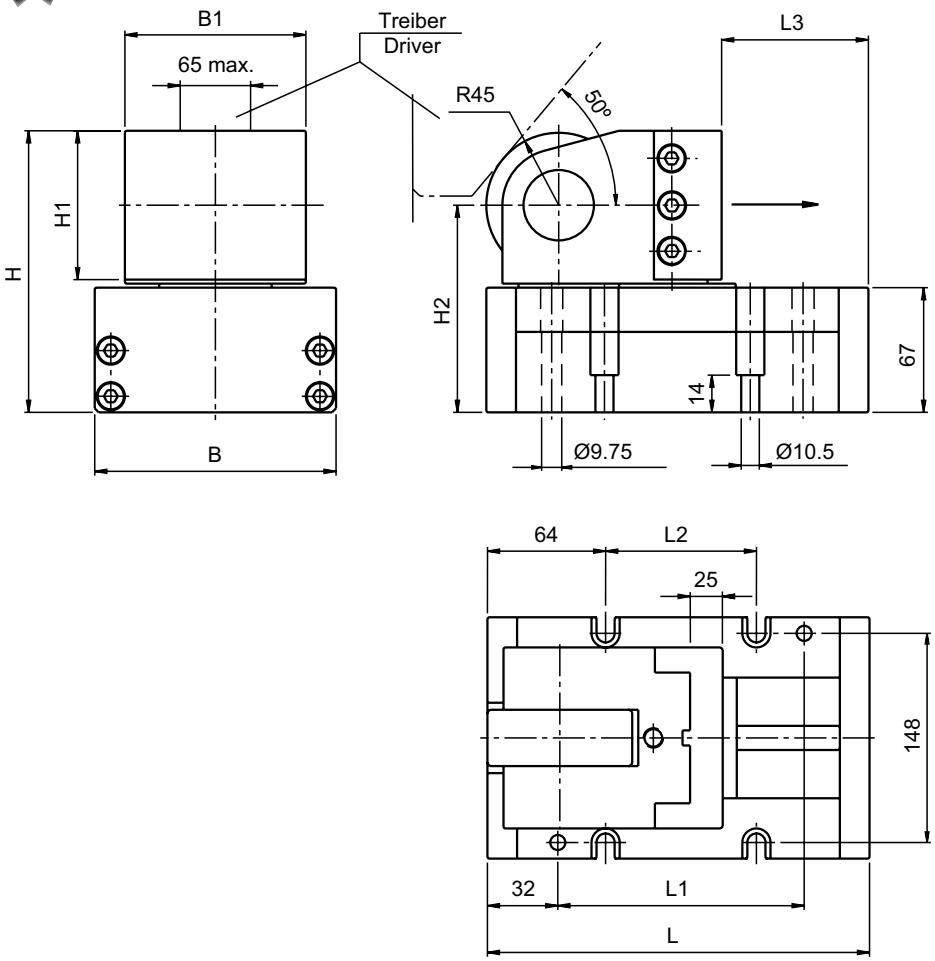
NCC.2.3

INFO TH.40

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern Gas springs
NCC.2.3.1	50	170	135	165	90	120	190	131	67	43	–	15000	250	NC.071.00.00250.063,5
NCC.2.3.2	80	170	135	165	90	120	220	161	97	73	–	15000	250	NC.071.00.00250.080
NCC.2.3.3	100	170	135	165	90	120	260	201	137	73	–	15000	250	NC.071.00.00250.100

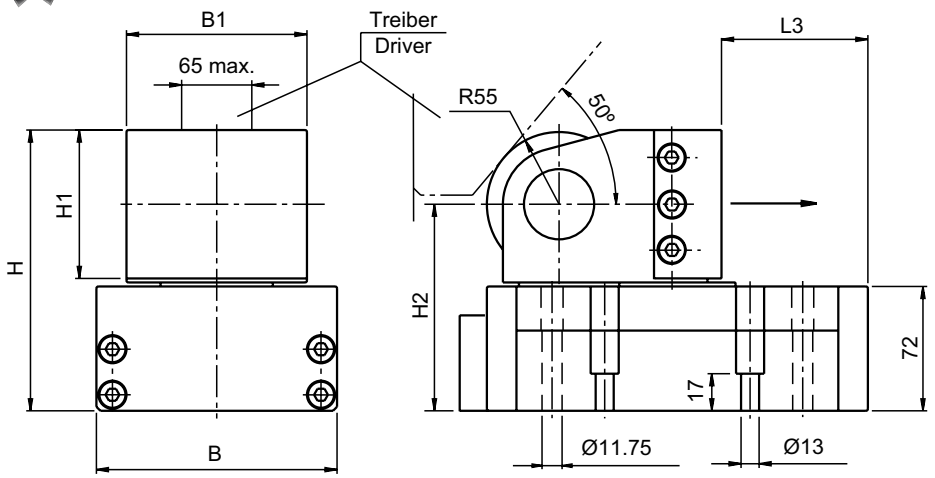
NCC.2.4

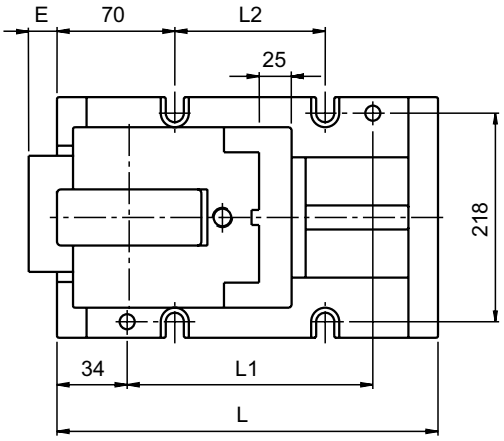
INFO TH.40

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern Gas springs
NCC.2.4.1	50	240	200	190	110	135	220	152	80	48	7	20000	500	NC.071.00.00500.063,5
NCC.2.4.2	80	240	200	190	110	135	250	182	110	78	10	20000	500	NC.071.00.00500.080
NCC.2.4.3	100	240	200	190	110	135	270	202	130	78	10	20000	500	NC.071.00.00500.100

NCC.4.1

INFO TH.40

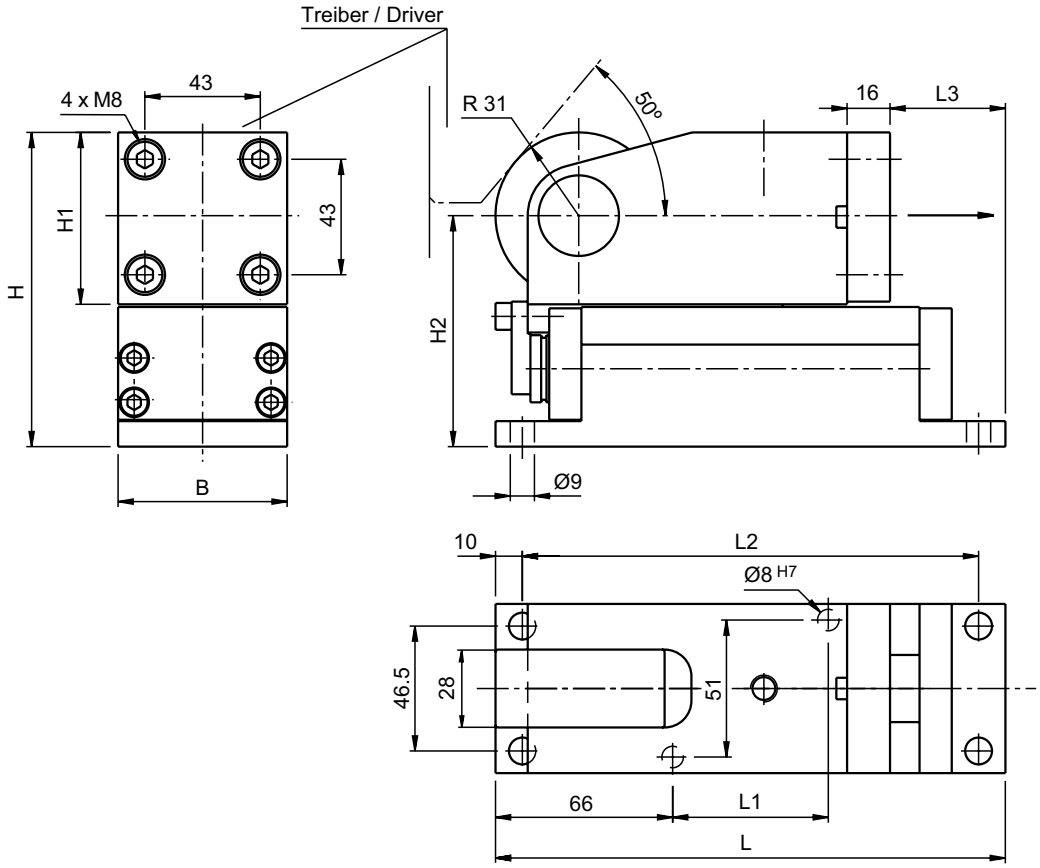
nach CNOMO-Norm

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern 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

NCC.4.2

INFO TH.40

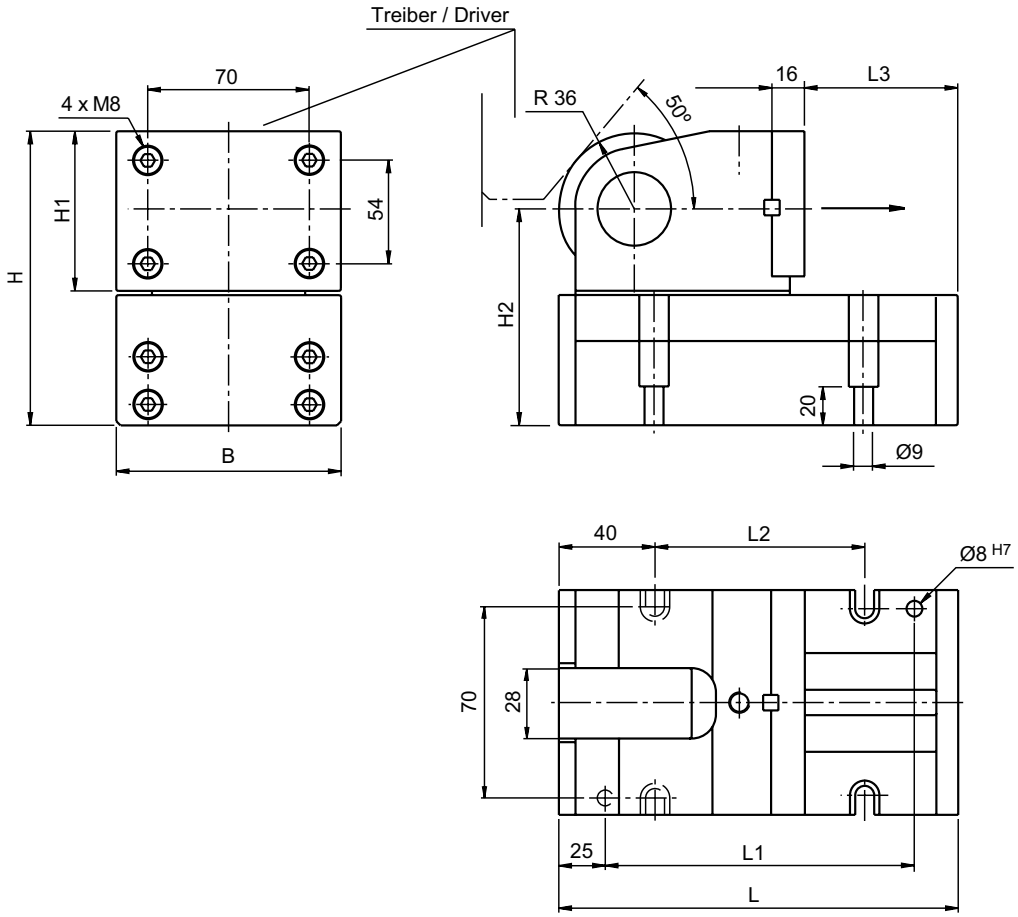
nach CNOMO-Norm

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern Gas springs
NCC.4.2.1	50	90	140	74	103	190	140	110	43	5000	100	NC.071.00.00100.050
NCC.4.2.2	80	90	140	74	103	220	170	140	73	5000	100	NC.071.00.00100.080
NCC.4.2.3	100	90	157	74	120	260	210	180	102	5000	100	NC.071.00.00100.100

NCC.4.3

INFO TH.40

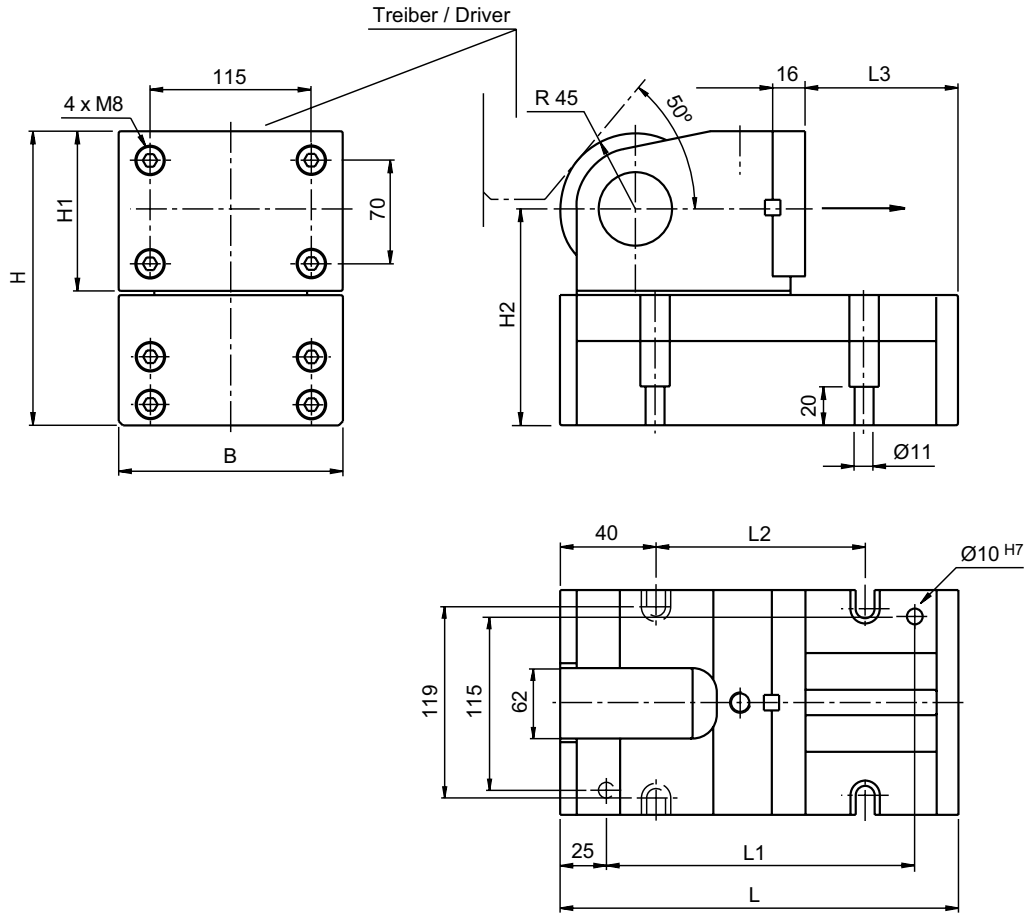
nach CNOMO-Norm

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern Gas springs
NCC.4.3.1	50	135	160	90	115	190	140	110	43	15000	150	NC.071.00.00150.050
NCC.4.3.2	80	135	160	90	115	220	170	140	73	15000	150	NC.071.00.00150.080
NCC.4.3.3	100	135	177	90	132	260	210	180	93	15000	150	NC.071.00.00150.100

NCC.4.4

INFO TH.40

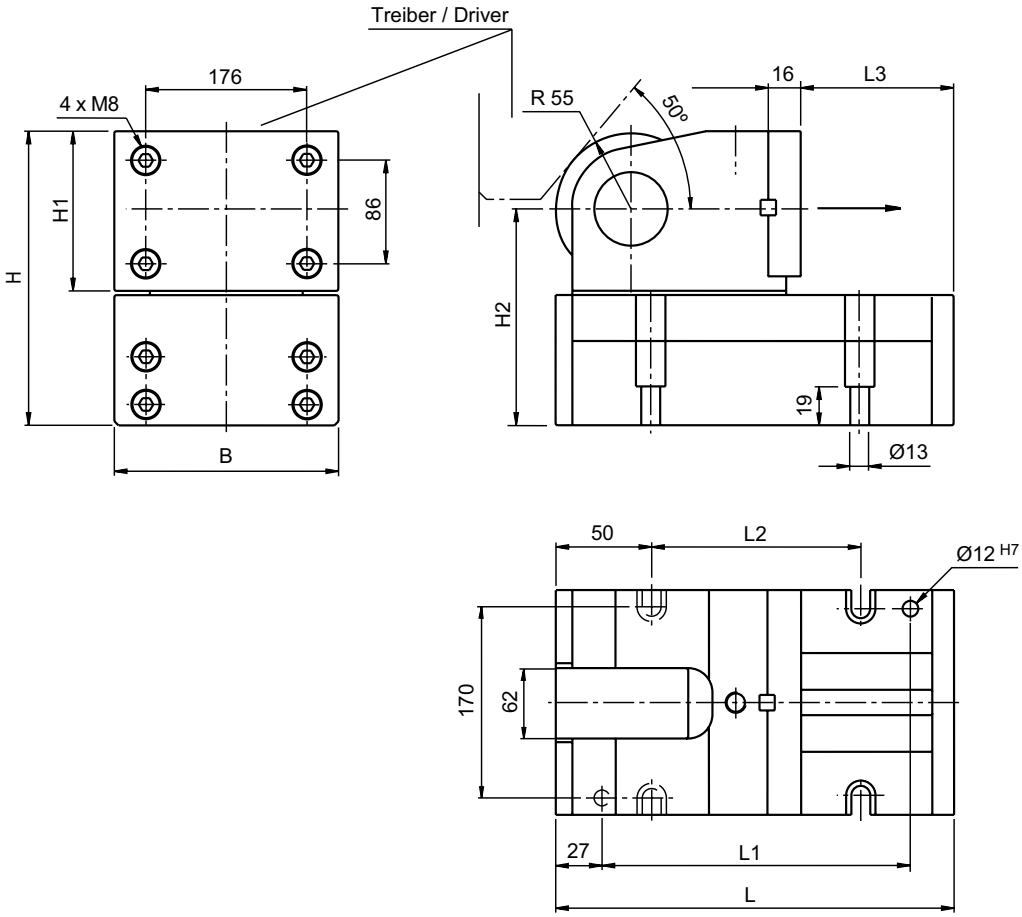
nach CNOMO-Norm

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern Gas springs
NCC.4.4.1	50	200	182	110	127	215	161	115	43	20000	250	NC.071.00.00250.050
NCC.4.4.2	80	200	182	110	127	245	191	145	73	20000	250	NC.071.00.00250.080
NCC.4.4.3	100	200	182	110	127	265	211	165	93	20000	250	NC.071.00.00250.100

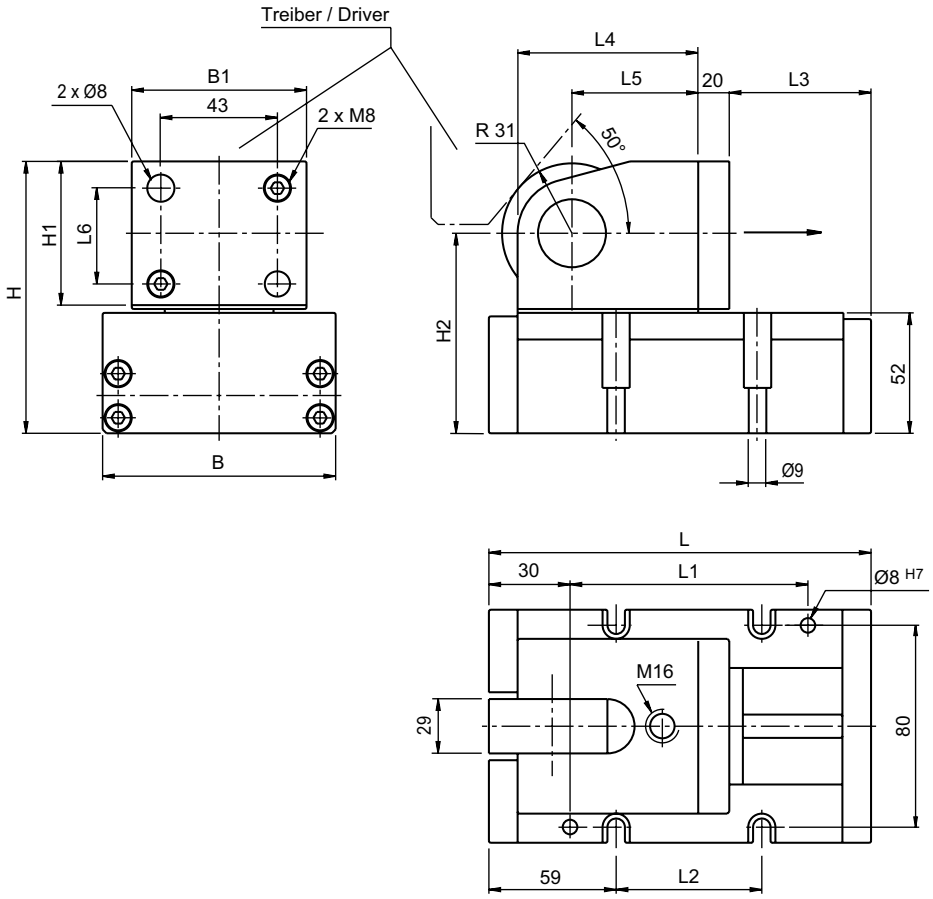
NCC.5.1

INFO TH.40

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern 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

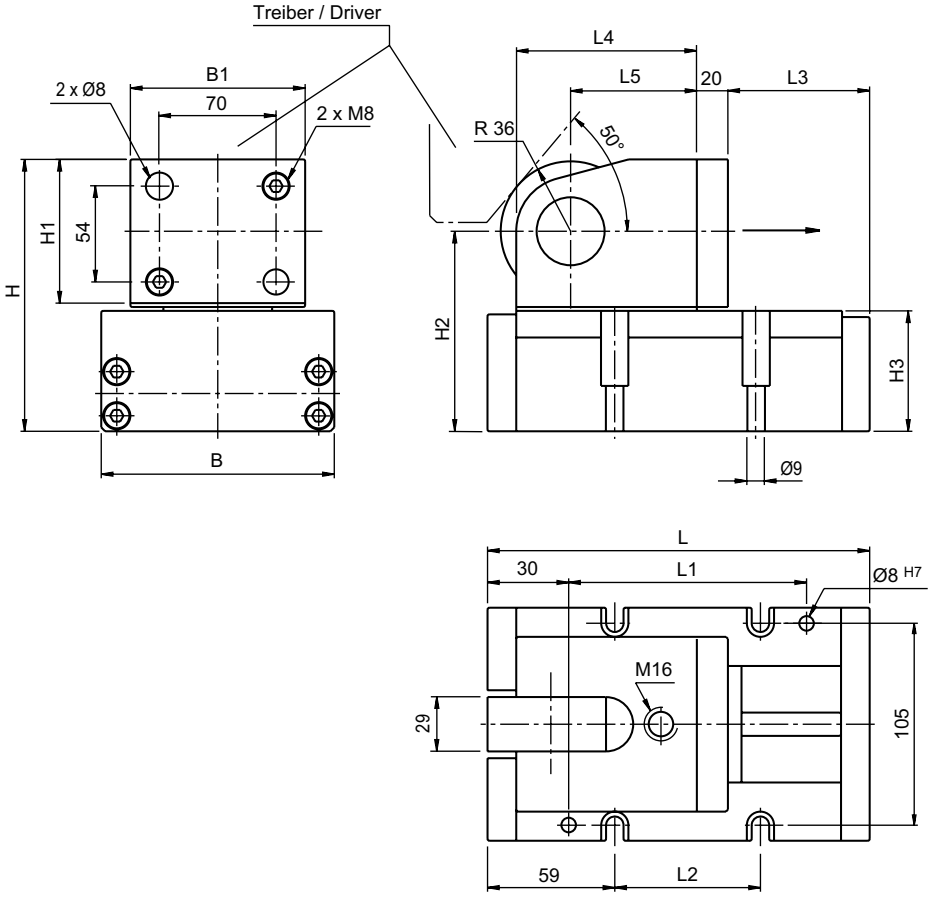
NCC.5.2

INFO TH.40

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern Gas springs
NCC.5.2.1	50	120	90	140	74	103	62	190	134	76	73	85	61	5000	200	NC.054.00.00200.050
NCC.5.2.2	80	120	90	140	74	103	62	220	164	106	73	115	91	5000	200	NC.054.00.00200.080
NCC.5.2.3	100	120	90	157	74	120	72	260	204	146	73	155	131	5000	200	NC.054.00.00200.100

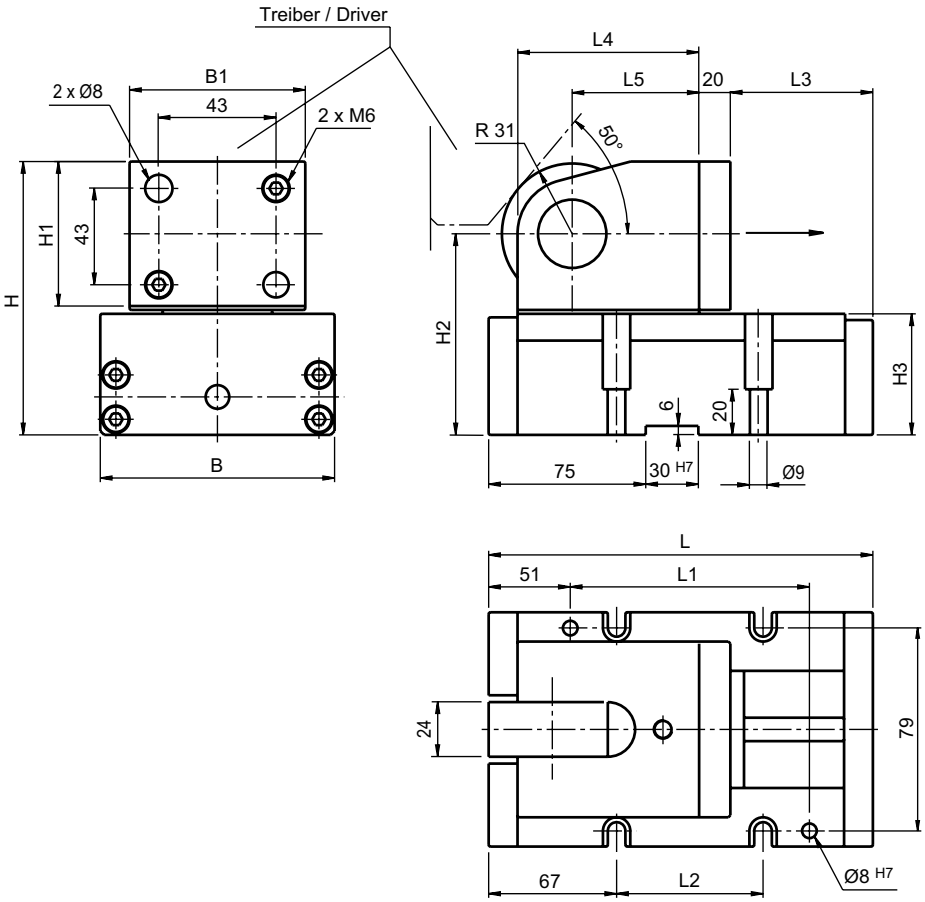
NCC.6.1

INFO TH.40

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern 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

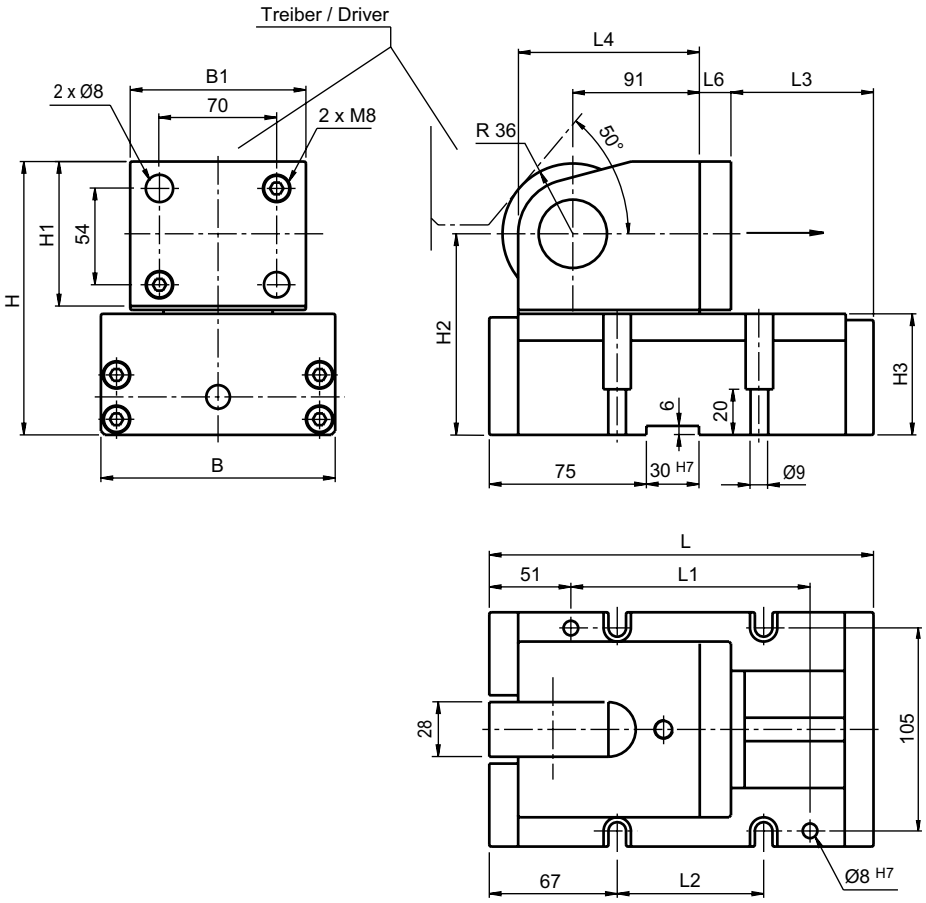
NCC.6.2

INFO TH.40

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 Cutting force daN max.	Rückstellkraft Return force daN	Type Gasdruckfedern Gas springs
NCC.6.2.1	50	120	90	140	74	103	62	190	88	56	43	115	20	5000	200	NC.054.00.00200.050
NCC.6.2.2	80	120	90	140	74	103	62	220	118	86	73	115	20	5000	200	NC.054.00.00200.080
NCC.6.2.3	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.

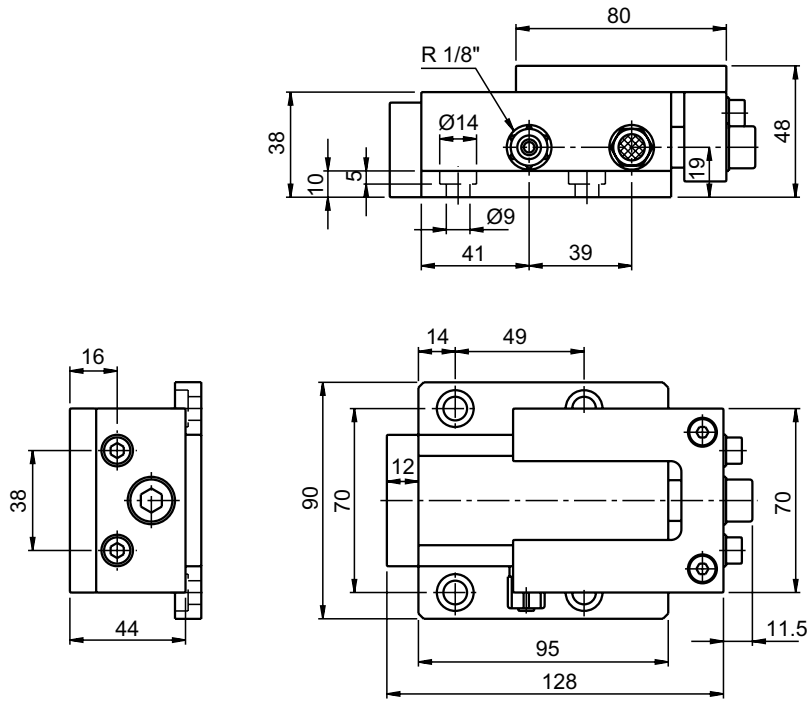
The NitroCyl part conveyors, driven by compressed air, were specifically designed for the quick and reliable transportation of sheet metal parts (and scrap) out of the die. Due to their more compact design (compared with belt-conveyors), they allow to work even in areas with limited space. The user simply 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



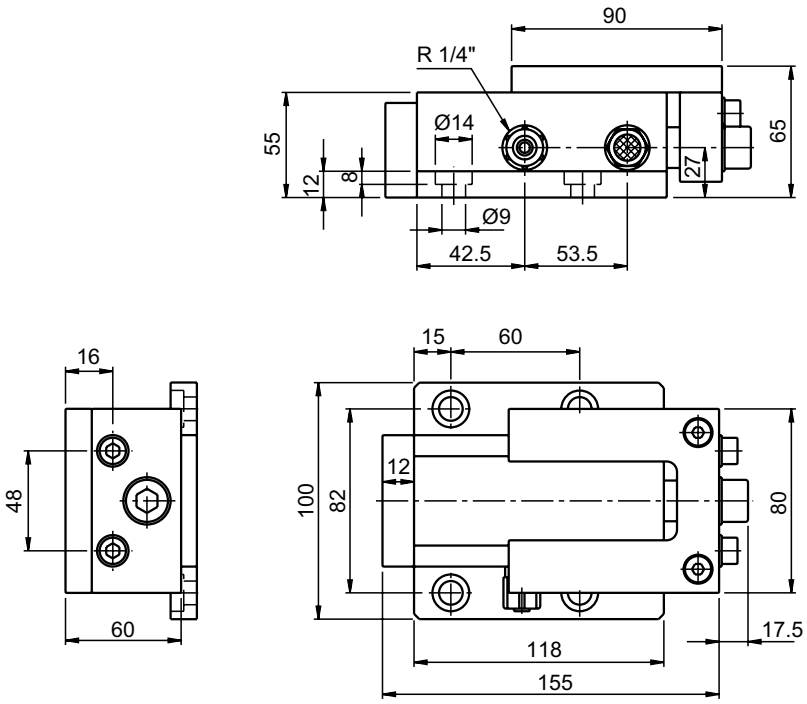
Medium	Arbeitsdruck Working pressure [bar]	Max. Hub Max. Stroke [mm]	Empf. Neigung in Transportrichtung Recommended inclination in transport-direction	Max. Belastbarkeit Max. load capacity [kg]
Luft / Air	4 / 6	30	6°	6

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



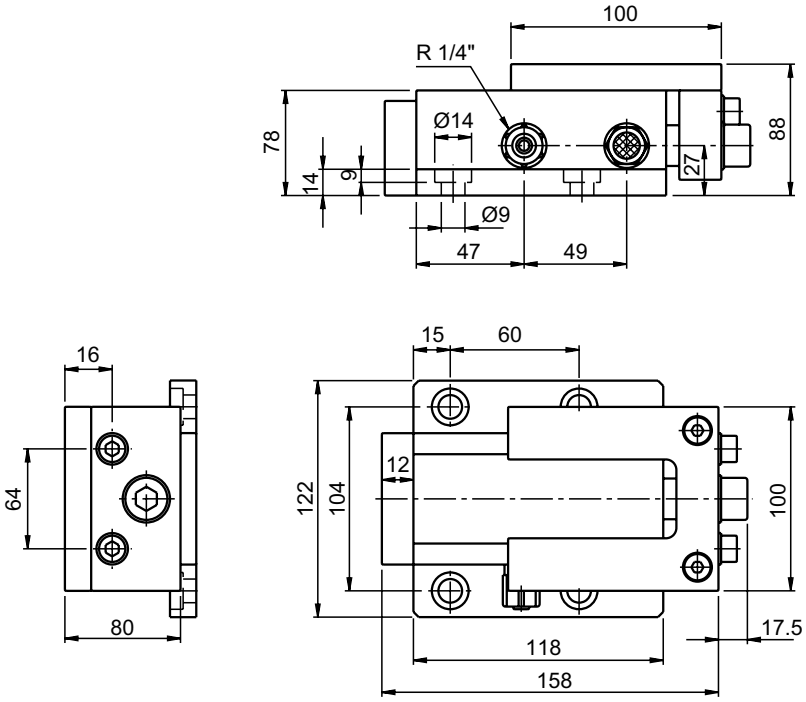
Medium	Arbeitsdruck Working pressure [bar]	Max. Hub Max. Stroke [mm]	Empf. Neigung in Transportrichtung Recommended inclination in transport-direction	Max. Belastbarkeit Max. load capacity [kg]
Luft / Air	4 / 6	33	6°	14

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



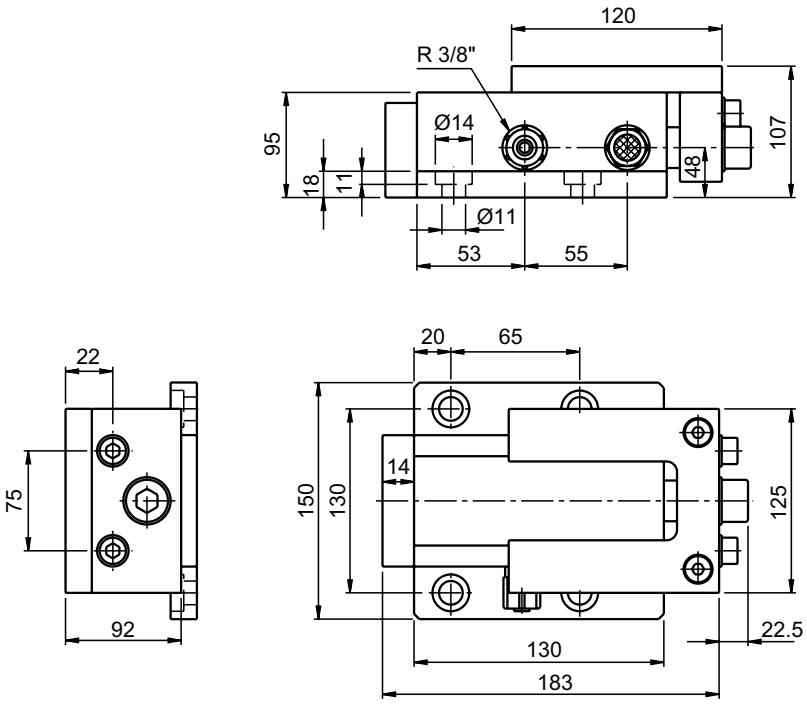
Medium	Arbeitsdruck Working pressure [bar]	Max. Hub Max. Stroke [mm]	Empf. Neigung in Transportrichtung Recommended inclination in transport-direction	Max. Belastbarkeit Max. load capacity [kg]
Luft / Air	4 / 6	20	6°	36

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



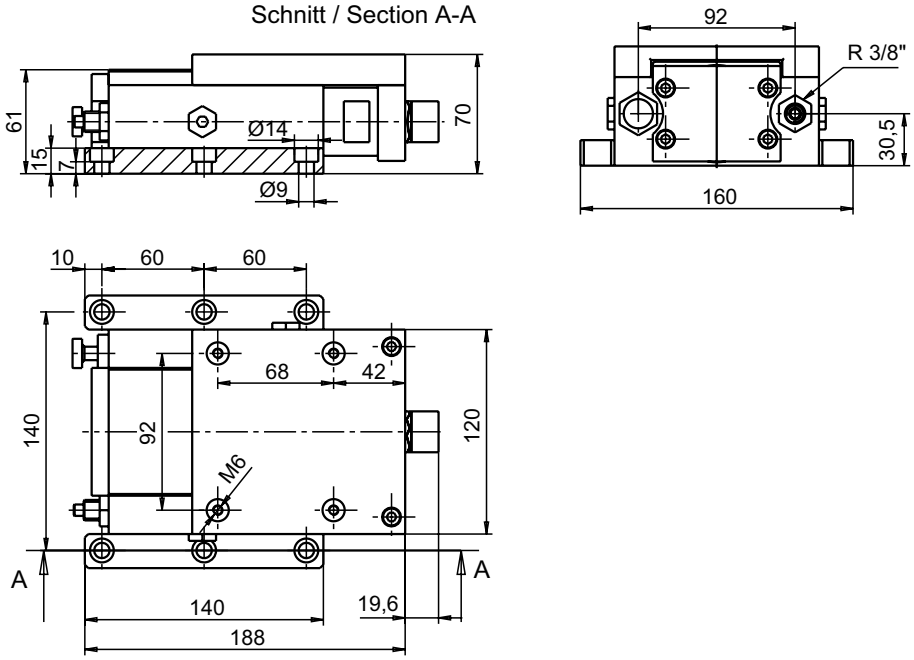
Medium	Arbeitsdruck Working pressure [bar]	Max. Hub Max. Stroke [mm]	Empf. Neigung in Transportrichtung Recommended inclination in transport-direction	Max. Belastbarkeit Max. load capacity [kg]
Luft / Air	4 / 6	28	6°	56

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.

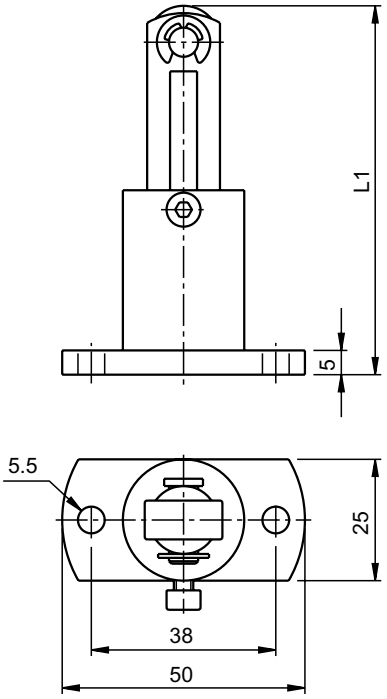
NCV.5.36.20



Medium	Arbeitsdruck Working pressure [bar]	Max. Hub Max. Stroke [mm]	Empf. Neigung in Transportrichtung Recommended inclination in transport-direction	Max. Belastbarkeit Max. load capacity [kg]
Luft / Air	4 / 6	20	6°	36

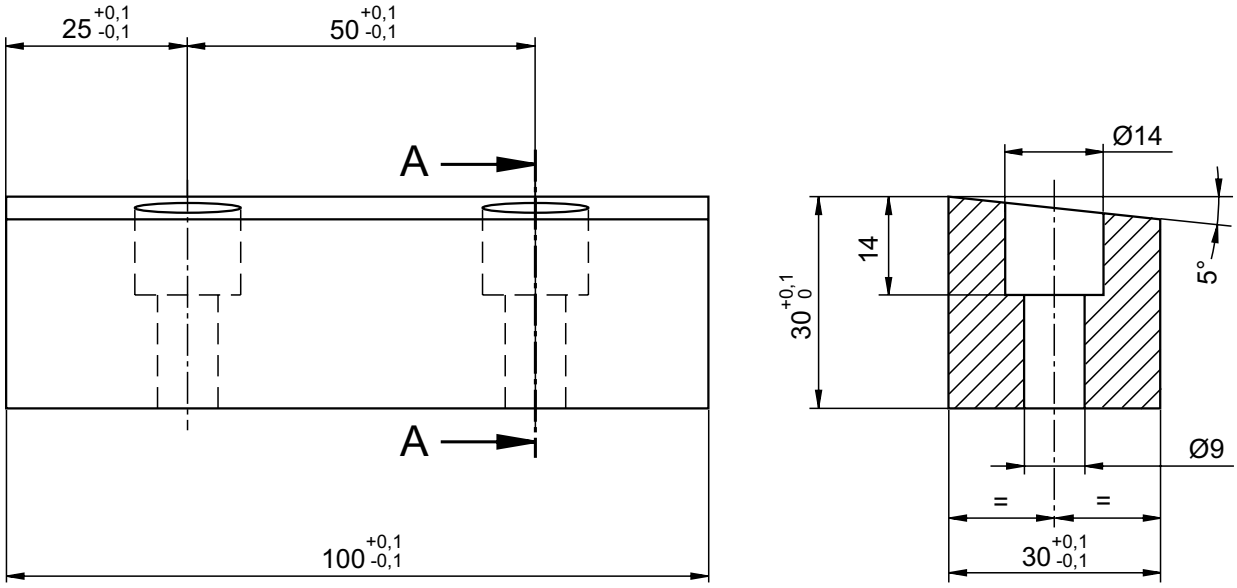
NCVA

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

NCVA.4

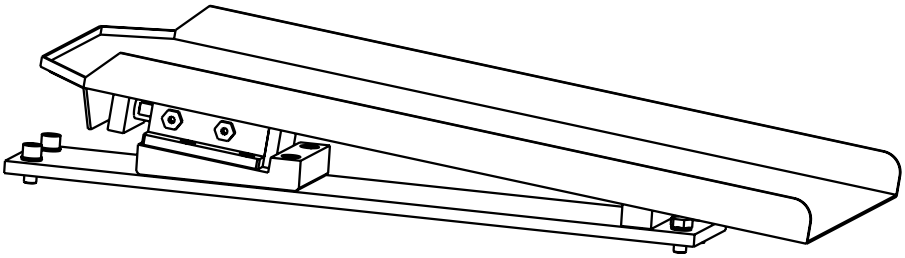


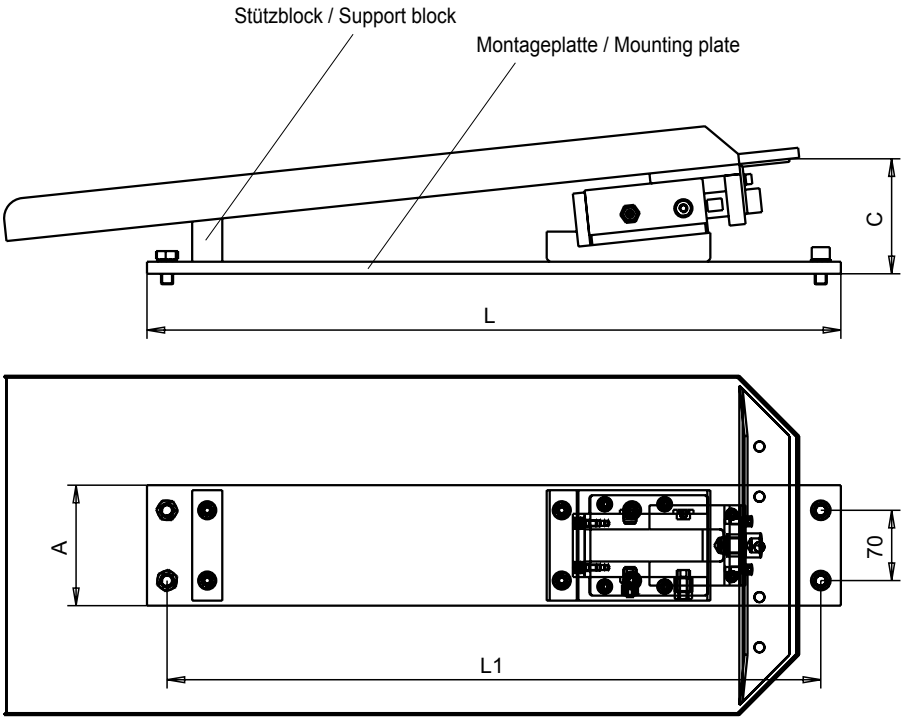
Aufbau Transport-Rinne

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 / for type		C (Maß ohne Rinne) (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

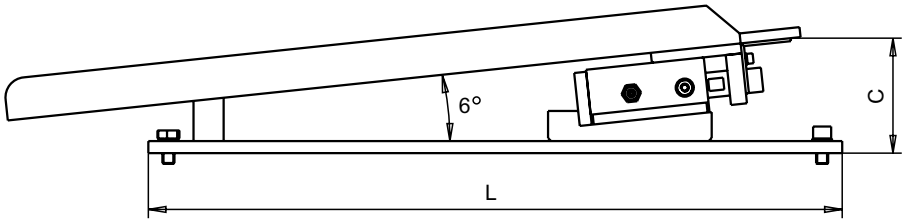
1. Mit Hilfe der Montageplatte können Teileförderer in engen und schwer zugänglichen Pressen-Bereichen sicher montiert werden
2. Wird die Montageplatte einbau-abhängig gekürzt, ändert sich die Höhe der Stützen.
3. Die angegebenen Längen der Montageplatten sind Beispiele. Bei größeren Abmessungen verändert sich die Höhe der Stütze, wobei der Arbeitswinkel von 6° bestehen bleibt.

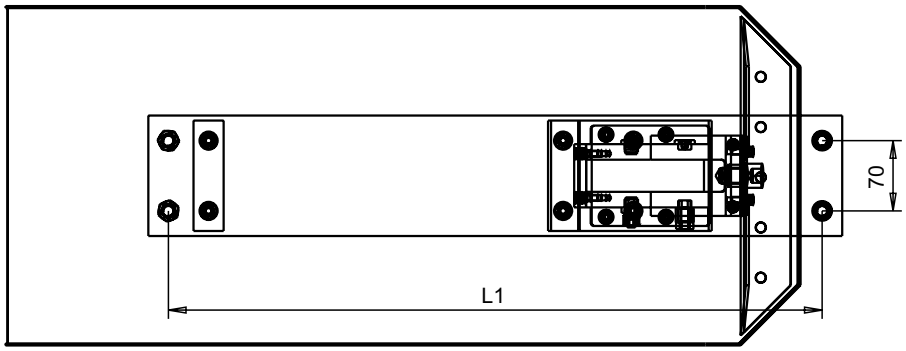
Δ C = (neue Länge – alte Länge) x tan 6°
(Δ C = Höhenveränderung)

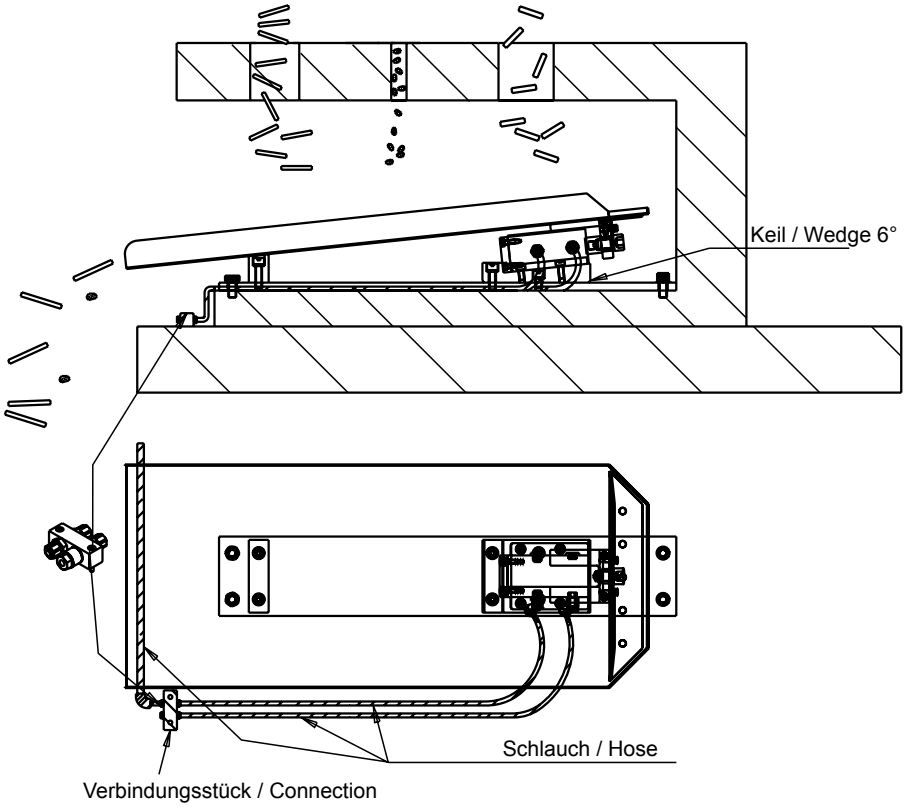
Design of the transport-channel

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°.

Δ C = (new length - old length) x tan 6°
(Δ C = height alteration)







Schlauch -ø:
für Type NCV.1 und NCV.2: ø = 6 mm
für Type NCV.3, NCV.4 u. NCV.5: ø = 8 mm

Hose-ø:
for Type NCV.1 and NCV.2: ø = 6 mm
for Type NCV.3, NCV.4 u. NCV.5: ø = 8 mm

Aufbau Transport-Rinne

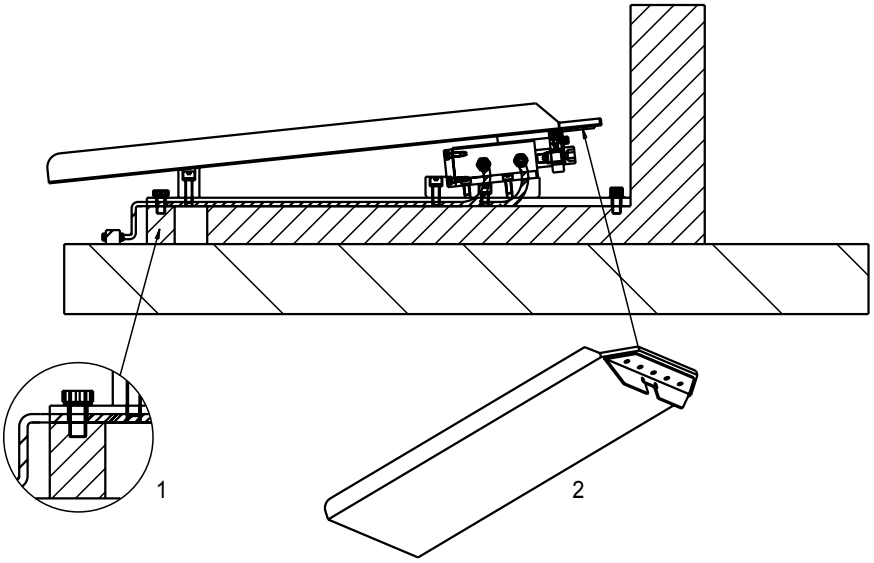
1. Die Montage-Platte kann durch Hilfsmittel (Leisten / Platten usw.) an Werkzeug oder Presse befestigt werden.
2. Das Befestigen der Transport-Rinne mit dem Teileförderer erfolgt mittels eines Winkels, welcher mit der Rinne verschweißt wird. Jetzt kann die Rinne mit dem Teileförderer verschraubt werden. 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.

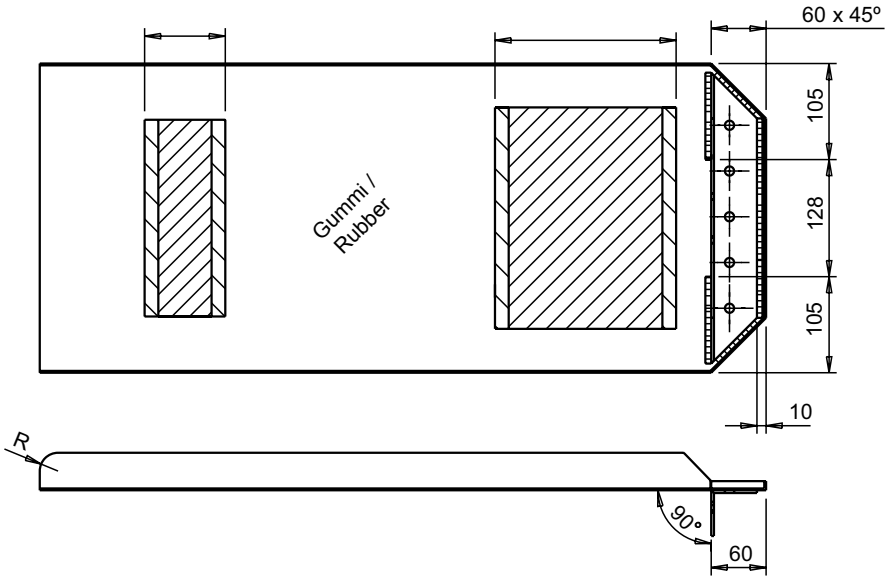
Wir liefern keine fertigen Transport-Rinnen, können Ihnen aber das Grundmaterial und konstruktive Hilfe bieten.

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.



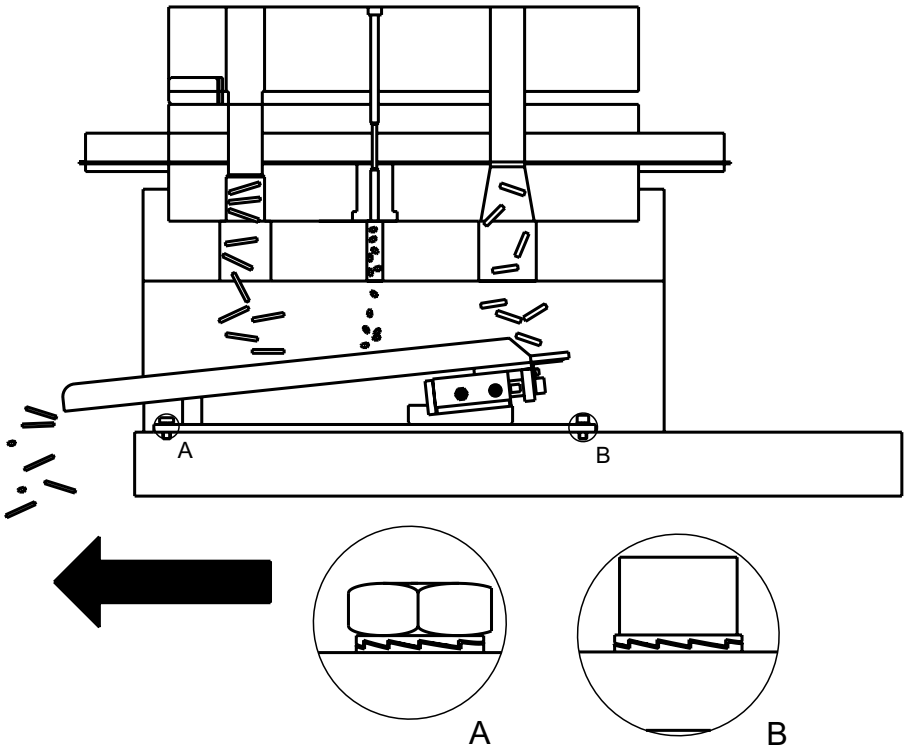


Befestigung

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 srews 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 parallely 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.

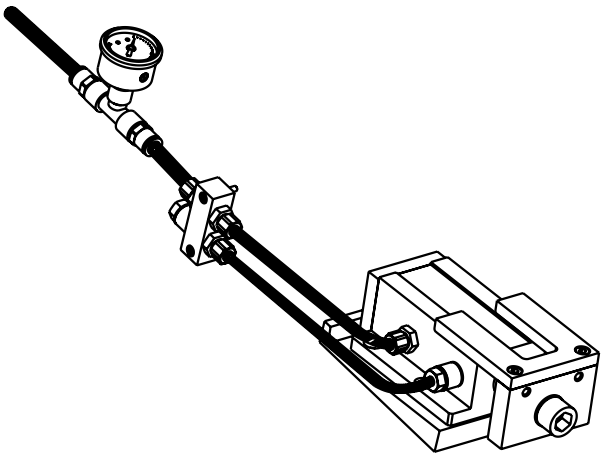


Tabelle für min. Außen-ø der Luftschläuche / Table showing minimal outside diameters of air hoses

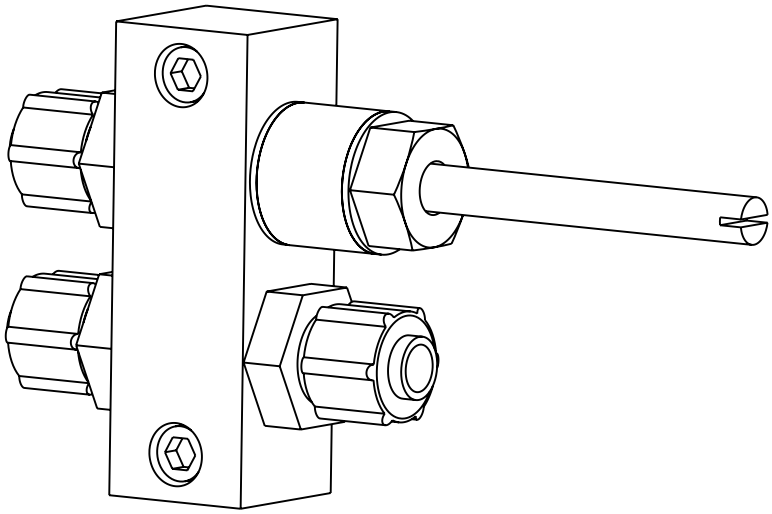
für Type / for type	Anzahl Teileförderer / Number of part conveyor					
	1	2	3	4	5	6
NCV.1…	6	10	12	12	14	16
NCV.2…	6	10	12	12	14	16
NCV.3…	8	12	14	16	18	20
NCV.4…	8	12	14	16	18	20
NCV.5…	8	12	14	16	18	20

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 Transport-Rinne 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

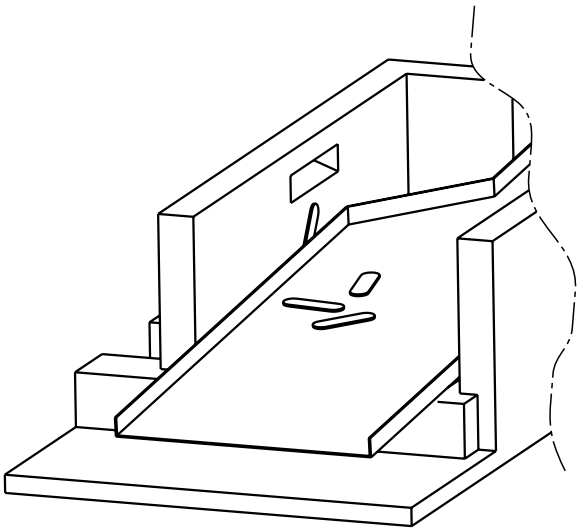
1. Achten Sie darauf, dass keine Kontaktpunkte zwischen der Transport-Rinne, dem Werkzeug und der Maschine oder sonstigen Anbauten bestehen. Es könnte sonst der Fall eintreten, dass der Teileförderer in seiner Hub-Bewegung gestoppt wird. Das gleiche könnte geschehen, wenn einzelne Abfallstücke zwischen 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 Berührung 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“.

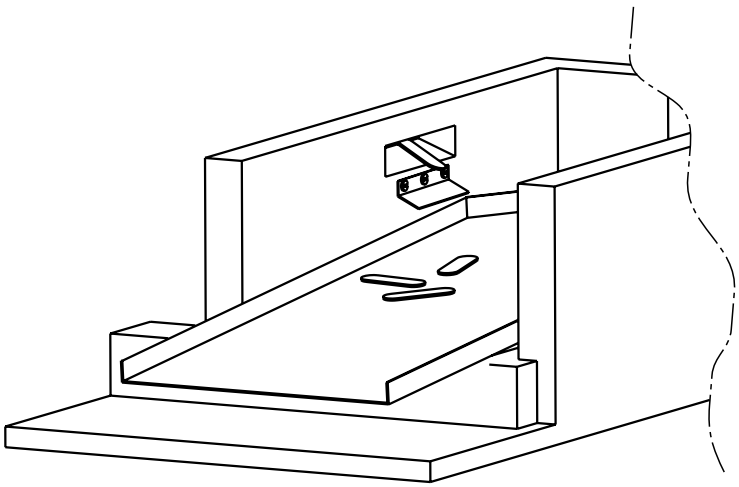
Es muss sichergestellt sein, dass keine Abfälle zwischen die Transport-Rinne und das Werkzeug bzw. die Anbauten gelangen können, da dies zum Ausfall / Stillstand des Teileförderers führen kann.
Montieren Sie daher (wie dargestellt) kleine Leitbleche.

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



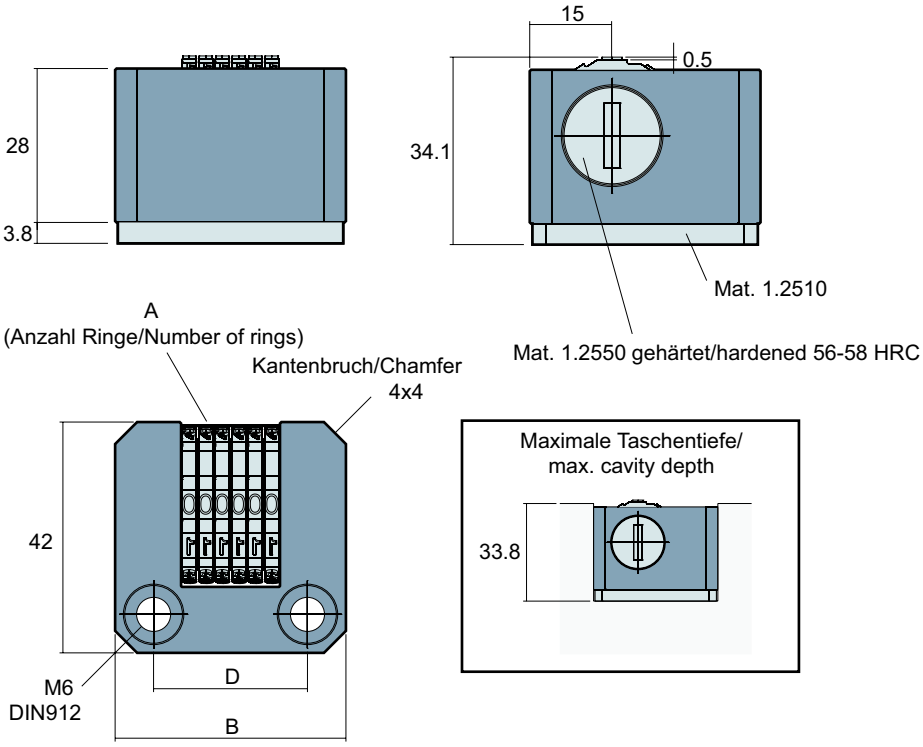


TH 926

Mat.: 42CrMo4

Mat.: 42CrMo4

TH 926 / 04



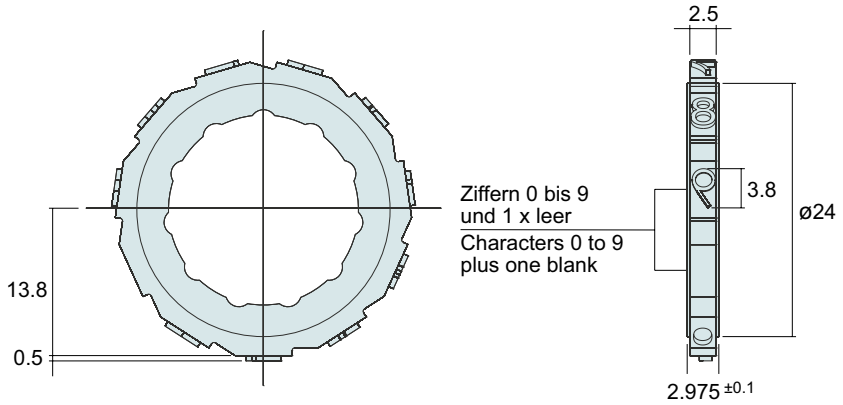
A	B	D
04	36	22
06	42	28

TH 927

Mat.: 1.2379
Härte: 56 - 59 HRC

Mat.: 1.2379
Hardness: 56 - 59 HRC

TH 927



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 Stempeleinsätze in unterschiedlichsten Schriftgrößen, wie Zahlen- und/oder Buchstabenstempel, Kontrollstempel, Körnerspitzen etc. in Standard- und Sonderausführungen ermöglichen ein weites Einsatzgebiet für die dauerhafte Werkstückkennzeichnung.

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 Prägewerk /
TH 932 with manual indexing numbering head

TH 930
TH 931
TH 932

Druckluftbedarf:	2 - 6 bar	Air pressure:	2 - 6 bar
Schlauchanschluss:	G1/8“	Air tube connector:	G1/8“

TH 930

Technische Daten / Technical Data:

Type	Gesamtlänge Length [mm]	Gewicht Weight [g]	Werkzeugaufnahme Tooling fixture [mm]	Stempelleistung Impact force [kN]
TH 930	~ 260	800	8	~ 10
TH 931	~ 300	1200	10	~ 20
TH 932	~ 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 Character Height [mm]	max. Anzahl Prägestellen / max. numbers of characters					
	Mat.: Alu / Aluminium			Mat.: St (ST 37) / Steel (St37)		
	TH 930	**TH 931**	**TH 932**	**TH 930**	**TH 931**	**TH 932**
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 diamater 6 mm

Schrifthöhe / Character Size
2 mm: 3 Zeichen / signs
3 mm: 2 Zeichen / signs
4 mm: 1 Zeichen / signs

TH 931 mit / with diamater 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 diamater 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

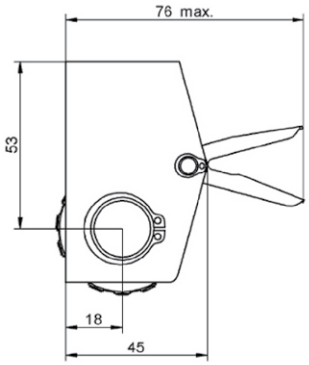
Mat.: 1.2379
Härte: 56 - 59 HRC

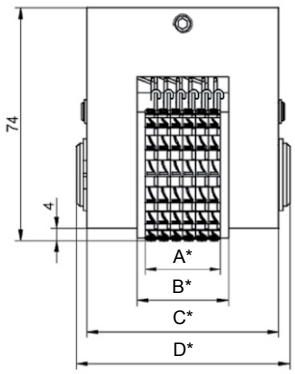
Mat.: 1.2379
Hardness: 56 - 59 HRC

TH 933

Manuell einstellbar –
Verstellhebel arretiert das Prägerad in gewünschter Position.

Manual adjustable numbering head. The lever lock the wheels in the choosen position





* = 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 / Chatacter 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

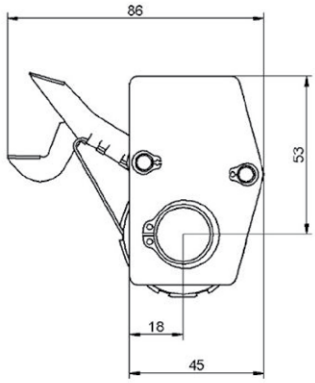
Mat.: 1.2379
Härte: 56 - 59 HRC

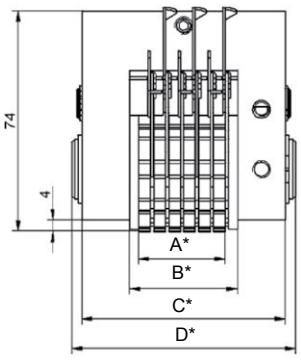
Mat.: 1.2379
Hardness: 56 - 59 HRC

TH 934

Manuell einstellbar –
Tasthebel ermöglicht schnelles Verstellen von Stelle zu Stelle.

Manual adjustable key numbering head. The adjustment of the wheels from posiotin to position effects manually though pressing the key levers





* = 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 / Chatacter 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

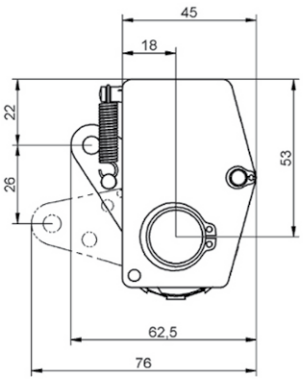
Mat.: 1.2379
Härte: 56 - 59 HRC

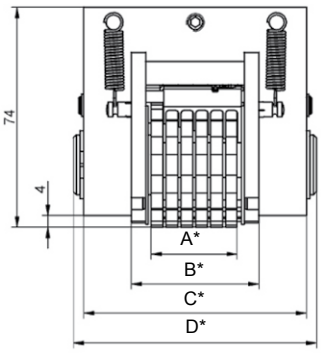
Mat.: 1.2379
Hardness: 56 - 59 HRC

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).

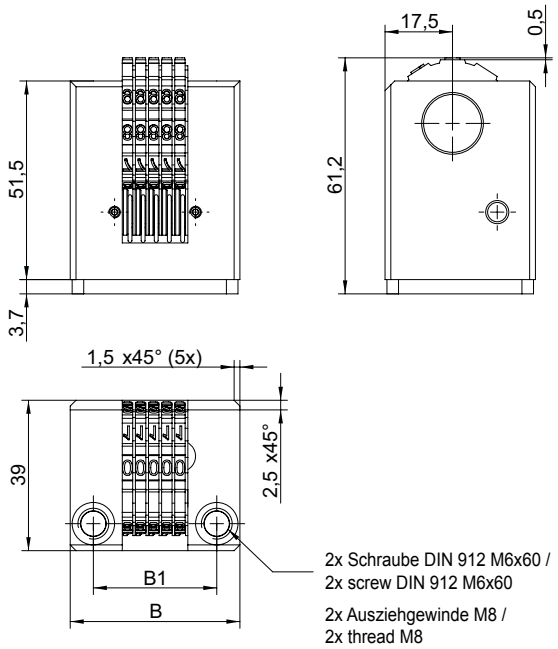
Schrifthöhe / Chatacter size [mm]	Radteilung / Partition of the wheel*
1 - 4	10
5	10
6	10
8	10
* = verfügbare Flächen am Umfang / available surfaces on the circumference	

TH 936

Mat.: 1.2842

Mat.: 1.2842

TH 936 / 03 x 4



Anzahl Prägeräder / Nummber of wheels	Schrifthöhe / Character size [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 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, glas 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 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 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 benzone).

Aerosol can, 400 ml

TH 012

[TH]

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

Sprühdose, 400 ml

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

TH 013

[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 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 ultra-pure, 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 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 017

Füge-Verbindungskleber **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 visciosity, 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.

Tube, 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

Collapsible tube, 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]

zertifiziert ISO 9001 for you Cert

MSPN GMBH

Märkische Stanz-Partner

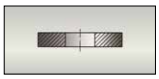
[federelemente]

[springs]

	Tellerfedern, Distanzeinheiten	Disk washers, spacers	Best.-Nr. Order no.	Seite Page
	Distanzeinheiten, geschliffen	Spacers, ground	FE 830	FE.2
	Distanzrohre, geschliffen	Spacer tubes, ground	FE 829	FE.3
	Scheiben für Zylinderschraube, nicht geschliffen	Disks for hexagon socket head cap screw, not ground	FE 828	FE.3
	Tellerfedern DIN 2093	Disk springs DIN 2093	FE 850	FE.1

	Systemfedern	Compression springs	Best.-Nr. Order no.	Seite Page
	Systemfedern ISO 10243, Kennfarbe Grün: Leichte Belastung	Compression springs, ISO 10243 Color code green: light load springs	FE 831 LB	FE.4 FE.5
	Systemfedern ISO 10243, Kennfarbe Blau: Mittlere Belastung	Compression springs, ISO 10243 Color code blue: medium load springs	FE 832 MB	FE.6 FE.7
	Systemfedern ISO 10243, Kennfarbe Rot: Schwere Belastung	Compression springs, ISO 10243 Color code red: heavy load springs	FE 833 SB	FE.8 FE.9
	Systemfedern ISO 10243, Kennfarbe Gelb: Bes. schw. Belastung	Compression springs, ISO 10243 Color code yellow: extra h. load springs	FE 834 BB	FE.10 FE.11
	Systemfedern nach US-Farbcodierung, Kennfarbe Blau: Leichte Belastung	Compression springs, US color coded Color code blue: light load springs	FE 835 LB	FE.12 FE.13
	Systemfedern nach US-Farbcodierung, Kennfarbe Rot: Mittlere Belastung	Compression springs, US color coded Color code red: medium load springs	FE 836 MB	FE.14 FE.15
	Systemfedern nach US-Farbcodierung, Kennfarbe Gold: Schwere Belastung	Compression springs, US color coded Color code gold: heavy load springs	FE 837 SB	FE.16 FE.17
	Systemfedern nach US-Farbcodierung, Kennfarbe Grün: Bes. schw. Belastung	Compression springs, US color coded Color code green: extra h. load springs	FE 838 BB	FE.18 FE.19

	Urelastfedern	Elastomer springs	Best.-Nr. Order no.	Seite Page
	Hohlstangen	Hollow bars	FE 804, FE 805, FE 806	FE.21
	Urelastfedern DIN 9835, Kennfarbe Rot	Elastomer springs DIN 9835, color code red	FE 802	FE.20
	Vollstangen	Solid bars	FE 807, FE 808, FE 809	FE.23

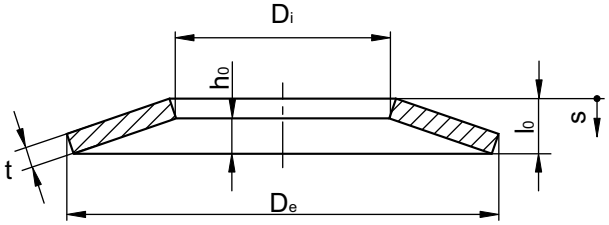
	Zubehör Bereich Federelemente	Accessories product line „springs“	Best.-Nr. Order no.	Seite Page
	Federteller DIN ISO 10069-2 für Urelastfedern	Spring washerss, DIN ISO 10069-2 for elastomer-springs	FE 815	FE.22
	Führungsbolzen für Urelastfedern	Guide pins for elastomer springs	FE 816	FE.22

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	l0	h0	s = 0,25 x h0			s = 0,5 x h0			s = 0,75 x h0		
					s	F N	σ N/mm²	s	F N	σ N/mm²	s	F N	σ N/mm²
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 830

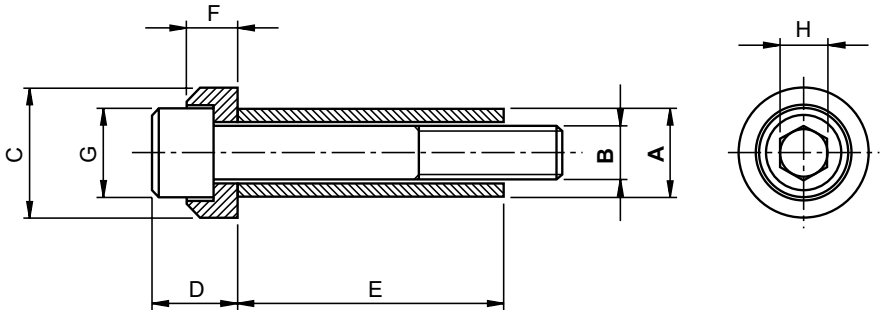
Mat.: Einsatzstahl
Festigkeitsklasse 12.9

Lieferumfang:
1. Distanzrohr
   Mat.: Vergütungsstahl, geschliffen
   Festigkeit: 120 - 140 kg/mm²
2. Scheibe für Zylinderkopfschraube
   Mat.: Vergütungsstahl, nicht geschliffen
   Festigkeit: 100 kg/mm²
3. Zylinderschraube mit Innensechskant

Mat.: case-hardened steel
Property class 12.9

Included:
1. Spacer tube
   Mat.: quenched and tempered steel, ground
   Tensile strength: 120 - 140 kg/mm²
2. Disk for cylinder head screw
   Mat.: quenched and tempered steel, not ground
   Tensile strength: 100 kg/mm²
3. Hexagon socket head cap screw

FE 830 / 15,0 x 50



A	B	C	D	F	G	H	E +0,1																	
h7		-0,1	±0,2	±0,2	max.		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]

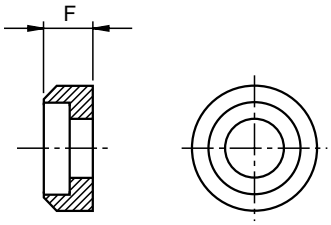
Scheiben für Zylinderschraube, nicht geschliffen

Disks for hex. socket head cap screws, not ground

FE 828

Mat.: Vergütungsstahl, nicht geschliffen
Festigkeit: 100 kg/mm²

Mat.: Quenched and tempere steel, not ground
Tensile strength: 100 kg/mm²



für Zylinderschrauben mit Innensechskant **TH 110** for socket head cap srews TH 110 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

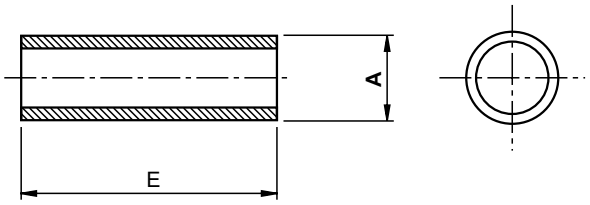
Spacer tubes, ground

FE 829

Mat.: Vergütungsstahl, geschliffen
Festigkeit: 120 - 140 kg/mm²

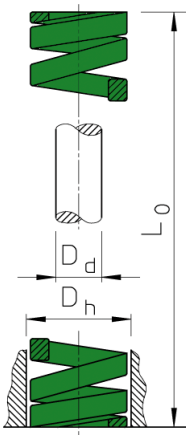
Mat.: Quenched and tempere steel, ground
Tensile strength: 120 - 140 kg/mm²

FE 829 / 12,5 x 50



A 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 831 LB



Dh	L0	Dd	C	25% Arbeitsweg Working stroke		30% Arbeitsweg Working stroke		40% Arbeitsweg Working stroke	
mm	mm	mm	N/mm	mm	N	mm	N	mm	N
10	**025**	5,0	10,0	6,3	63	7,5	75	10,0	100
	032		8,5	8,0	68	9,6	82	12,8	109
	038		6,8	9,5	65	11,4	78	15,2	103
	044		6,0	11,0	66	13,2	79	17,6	106
	051		5,0	12,8	64	15,3	77	20,4	102
	064		4,3	16,0	69	19,2	83	25,6	110
	076		3,2	19,0	61	22,8	73	30,4	97
	305		1,1	76,3	84	91,5	101	122,0	134
13	**025**	6,3	17,9	6,3	113	7,5	134	10,0	179
	032		16,4	8,0	131	9,6	157	12,8	210
	038		13,6	9,5	129	11,4	155	15,2	207
	044		12,1	11,0	133	13,2	160	17,6	213
	051		11,4	12,8	146	15,3	174	20,4	233
	064		9,3	16,0	149	19,2	179	25,6	238
	076		7,1	19,0	135	22,8	162	30,4	216
	089		5,4	22,3	120	26,7	144	35,6	192
	102		4,1	25,5	105	30,6	125	40,8	167
	305		1,4	76,3	107	91,5	128	122,0	171
16	**025**	8,0	23,4	6,3	147	7,5	176	10,0	234
	032		22,9	8,0	183	9,6	220	12,8	293
	038		19,3	9,5	183	11,4	220	15,2	293
	044		17,1	11,0	188	13,2	226	17,6	301
	051		15,7	12,8	201	15,3	240	20,4	320
	064		10,7	16,0	171	19,2	205	25,6	274
	076		10,0	19,0	190	22,8	228	30,4	304
	089		8,6	22,3	192	26,7	230	35,6	306
	102		7,8	25,5	199	30,6	239	40,8	318
	115		6,6	28,8	190	34,5	228	46,0	304
	305		2,5	76,3	191	91,5	229	122,0	305
20	**025**	10,0	55,8	6,3	352	7,5	419	10,0	558
	032		45,0	8,0	360	9,6	432	12,8	576
	038		33,3	9,5	316	11,4	380	15,2	506
	044		30,0	11,0	330	13,2	396	17,6	528
	051		24,5	12,8	314	15,3	375	20,4	500
	064		20,0	16,0	320	19,2	384	25,6	512
	076		16,0	19,0	304	22,8	365	30,4	486
	089		14,0	22,3	312	26,7	374	35,6	498
	102		12,0	25,5	306	30,6	367	40,8	490
	115		10,9	28,8	314	34,5	376	46,0	501
	127		9,5	31,8	302	38,1	362	50,8	483
	139		8,5	34,8	294	41,7	353	55,6	470
	152		7,5	38,0	285	45,6	342	60,8	456
	305		4,0	76,3	305	91,5	366	122,0	488
25	**025**	12,5	100,0	6,3	630	7,5	750	10,0	1000
	032		80,3	8,0	642	9,6	771	12,8	1028
	038		62,0	9,5	589	11,4	707	15,2	942
	044		52,9	11,0	582	13,2	698	17,6	931
	051		44,0	12,8	563	15,3	673	20,4	898
	064		35,2	16,0	563	19,2	676	25,6	901

D_h	L_0	D_d	C	25% Arbeitsweg Working stroke		30% Arbeitsweg Working stroke		40% Arbeitsweg Working stroke	
mm	mm	mm	N/mm	mm	N	mm	N	mm	N
25	**076**	12,5	28,0	19,0	532	22,8	638	30,4	851
	089		24,0	22,3	535	26,7	641	35,6	854
	102		21,1	25,5	538	30,6	646	40,8	861
	115		18,7	28,8	539	34,5	645	46,0	860
	127		16,7	31,8	531	38,1	636	50,8	848
	139		15,4	34,8	536	41,7	643	55,6	857
	152		14,0	38,0	532	45,6	638	60,8	851
	178		12,5	44,5	556	53,4	668	71,2	890
	203		10,4	50,8	528	60,9	633	81,2	844
	305		7,0	76,3	534	91,5	641	122,0	854
32	**038**	16,0	94,0	9,5	893	11,4	1072	15,2	1429
	044		79,5	11,0	875	13,2	1049	17,6	1399
	051		67,0	12,8	858	15,3	1025	20,4	1367
	064		53,0	16,0	848	19,2	1018	25,6	1357
	076		44,0	19,0	836	22,8	1003	30,4	1338
	089		37,2	22,3	830	26,7	993	35,6	1324
	102		32,0	25,5	816	30,6	979	40,8	1306
	115		29,0	28,8	835	34,5	1001	46,0	1334
	127		25,0	31,8	795	38,1	953	50,8	1270
	139		23,2	34,8	805	41,7	966	55,6	1288
	152		21,5	38,0	817	45,6	980	60,8	1307
	178		18,2	44,5	810	53,4	972	71,2	1296
	203		15,8	50,8	803	60,9	962	81,2	1283
	254		12,5	63,5	794	76,2	953	101,6	1270
	305		10,3	76,3	786	91,5	942	122,0	1257
40	**051**	20,0	92,0	12,8	1178	15,3	1408	20,4	1877
	064		73,0	16,0	1168	19,2	1402	25,6	1869
	076		63,0	19,0	1197	22,8	1436	30,4	1915
	089		51,0	22,3	1137	26,7	1362	35,6	1816
	102		43,0	25,5	1097	30,6	1316	40,8	1754
	115		39,6	28,8	1140	34,5	1366	46,0	1822
	127		37,0	31,8	1177	38,1	1410	50,8	1880
	139		32,2	34,8	1120	41,7	1344	55,6	1792
	152		28,0	38,0	1064	45,6	1277	60,8	1702
	178		25,2	44,5	1121	53,4	1346	71,2	1794
	203		22,7	50,8	1153	60,9	1382	81,2	1843
	254		17,0	63,5	1080	76,2	1295	101,6	1727
	305		14,8	76,3	1129	91,5	1354	122,0	1806
50	**064**	25,0	156,0	16,0	2496	19,2	2995	25,6	3994
	076		125,0	19,0	2375	22,8	2850	30,4	3800
	089		109,0	22,3	2431	26,7	2910	35,6	3880
	102		94,0	25,5	2397	30,6	2876	40,8	3835
	115		81,0	28,8	2333	34,5	2795	46,0	3726
	127		71,0	31,8	2358	38,1	2705	50,8	3607
	139		67,0	34,8	2328	41,7	2793	55,6	3724
	152		60,0	38,0	2280	45,6	2736	60,8	3648
	178		52,0	44,5	2314	53,4	2777	71,2	3702
	203		44,0	50,8	2235	60,9	2680	81,2	3573
	254		35,0	63,5	2223	76,2	2667	101,6	3556
	305		28,5	76,3	2175	91,5	2608	122,0	3477
63	**076**	38,0	189,0	19,0	3591	22,8	4309	30,4	5746
	089		158,0	22,3	3523	26,7	4219	35,6	5625
	102		131,0	25,5	3341	30,6	4009	40,8	5345
	115		116,0	28,8	3341	34,5	4002	46,0	5336
	127		103,0	31,8	3275	38,1	3924	50,8	5232
	152		84,3	38,0	3203	45,6	3844	60,8	5125
	178		71,5	44,5	3182	53,4	3818	71,2	5091
	203		61,7	50,8	3134	60,9	3758	81,2	5010
	254		47,0	63,5	2985	76,2	3581	101,6	4775
	305		38,2	76,3	2915	91,5	3495	122,0	4660

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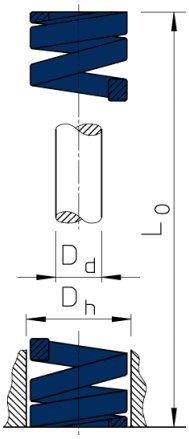

Dh mm	L0 mm	Dd mm	C N/mm	25% Arbeitsweg Working stroke mm	N	30% Arbeitsweg Working stroke mm	N	37,5% Arbeitsweg Working stroke mm	N
10	**025**	5,0	16,0	6,3	101	7,5	120	9,4	150
	032		13,0	8,0	104	9,6	125	12,0	156
	038		11,9	9,5	113	11,4	136	14,3	170
	044		10,3	11,0	113	13,2	136	16,5	170
	051		8,9	12,8	114	15,3	136	19,1	170
	064		7,5	16,0	120	19,2	144	24,0	180
	076		5,3	19,0	101	22,8	121	28,5	151
	305		1,6	76,3	122	91,5	146	114,4	183
13	**025**	6,3	30,0	6,3	189	7,5	225	9,4	282
	032		24,8	8,0	198	9,6	238	12,0	298
	038		21,4	9,5	203	11,4	244	14,3	306
	044		18,5	11,0	204	13,2	244	16,5	305
	051		15,5	12,8	198	15,3	237	19,1	296
	064		12,1	16,0	194	19,2	232	24,0	290
	076		10,2	19,0	194	22,8	233	28,5	291
	089		8,4	22,3	187	26,7	224	33,4	281
	102		6,3	25,5	161	30,6	193	38,3	241
	305		2,1	76,3	160	91,5	192	114,4	240
16	**025**	8,0	49,4	6,3	311	7,5	371	9,4	464
	032		37,1	8,0	297	9,6	356	12,0	445
	038		33,9	9,5	322	11,4	386	14,3	485
	044		30,0	11,0	330	13,2	396	16,5	495
	051		26,4	12,8	338	15,3	404	19,1	504
	064		20,5	16,0	328	19,2	394	24,0	492
	076		17,8	19,0	338	22,8	406	28,5	507
	089		15,2	22,3	339	26,7	406	33,4	508
	102		13,5	25,5	344	30,6	413	38,3	517
	115		11,8	28,8	340	34,5	407	43,1	509
	305		4,8	76,3	366	91,5	439	114,4	549
20	**025**	10,0	98,0	6,3	617	7,5	735	9,4	921
	032		72,6	8,0	581	9,6	697	12,0	871
	038		56,0	9,5	532	11,4	638	14,3	801
	044		47,5	11,0	523	13,2	627	16,5	784
	051		41,7	12,8	534	15,3	638	19,1	796
	064		32,3	16,0	517	19,2	620	24,0	775
	076		25,1	19,0	477	22,8	572	28,5	715
	089		22,0	22,3	491	26,7	587	33,4	735
	102		19,8	25,5	505	30,6	606	38,3	758
	115		18,1	28,8	521	34,5	624	43,1	780
	127		16,6	31,8	528	38,1	632	47,6	790
	139		15,2	34,8	529	41,7	634	52,1	793
	152		13,2	38,0	500	45,6	600	57,0	750
	305		6,1	76,3	465	91,5	558	114,4	698
25	**025**	12,5	147,0	6,3	926	7,5	1103	9,4	1382
	032		118,0	8,0	944	9,6	1133	12,0	1416
	038		93,0	9,5	884	11,4	1060	14,3	1330
	044		80,8	11,0	889	13,2	1067	16,5	1333
	051		68,6	12,8	878	15,3	1050	19,1	1310
	064		53,0	16,0	848	19,2	1018	24,0	1272

Dh	L0	Dd	C	25% Arbeitsweg Working stroke		30% Arbeitsweg Working stroke		37,5% Arbeitsweg Working stroke	
mm	mm	mm	N/mm	mm	N	mm	N	mm	N
25	076	12,5	43,2	19,0	821	22,8	985	28,5	1231
	089		38,2	22,3	852	26,7	1020	33,4	1276
	102		33,0	25,5	842	30,6	1010	38,3	1264
	115		28,0	28,8	806	34,5	966	43,1	1207
	127		25,9	31,8	824	38,1	987	47,6	1233
	139		23,4	34,8	812	41,7	974	52,1	1218
	152		20,8	38,0	790	45,6	948	57,0	1186
	178		17,8	44,5	792	53,4	951	66,8	1189
	203		15,8	50,8	803	60,9	962	76,1	1202
	305		10,2	76,3	778	91,5	933	114,4	1167
32	038	16,0	185,0	9,5	1758	11,4	2109	14,3	2646
	044		158,0	11,0	1738	13,2	2086	16,5	2607
	051		134,0	12,8	1715	15,3	2050	19,1	2559
	064		99,0	16,0	1584	19,2	1901	24,0	2376
	076		80,5	19,0	1530	22,8	1835	28,5	2294
	089		69,1	22,3	1541	26,7	1845	33,4	2308
	102		58,8	25,5	1499	30,6	1799	38,3	2252
	115		51,5	28,8	1483	34,5	1777	43,1	2220
	127		44,8	31,8	1425	38,1	1707	47,6	2132
	139		42,6	34,8	1481	41,7	1777	52,1	2221
	152		37,8	38,0	1436	45,6	1724	57,0	2155
	178		32,5	44,5	1446	53,4	1736	66,8	2171
	203		28,9	50,8	1468	60,9	1760	76,1	2199
	254		21,4	63,5	1359	76,2	1631	95,3	2039
	305		18,3	76,3	1396	91,5	1674	114,4	2094
40	051	20,0	181,6	12,8	2324	15,3	2778	19,1	3469
	064		140,0	16,0	2240	19,2	2688	24,0	3360
	076		108,0	19,0	2052	22,8	2462	28,5	3078
	089		90,7	22,3	2023	26,7	2422	33,4	3029
	102		81,0	25,5	2066	30,6	2479	38,3	3102
	115		71,8	28,8	2068	34,5	2477	43,1	3095
	127		62,7	31,8	1994	38,1	2389	47,6	2985
	139		57,9	34,8	2013	41,7	2415	52,1	3019
	152		51,6	38,0	1961	45,6	2353	57,0	2941
	178		44,1	44,5	1962	53,4	2355	66,8	2946
	203		36,7	50,8	1864	60,9	2235	76,1	2793
	254		30,1	63,5	1911	76,2	2294	95,3	2869
	305		24,6	76,3	1877	91,5	2251	114,4	2814
50	064	25,0	209,0	16,0	3344	19,2	4013	24,0	5016
	076		168,0	19,0	3192	22,8	3830	28,5	4788
	089		140,0	22,3	3122	26,7	3738	33,4	4676
	102		119,0	25,5	3035	30,6	3641	38,3	4558
	115		106,0	28,8	3053	34,5	3657	43,1	4569
	127		97,0	31,8	3085	38,1	3696	47,6	4617
	139		87,6	34,8	3045	41,7	3654	52,1	4568
	152		80,0	38,0	3040	45,6	3648	57,0	4560
	178		69,5	44,5	3093	53,4	3711	66,8	4643
	203		59,8	50,8	3038	60,9	3642	76,1	4551
	229		50,9	57,3	2917	68,7	3497	85,9	4372
	254		43,9	63,5	2788	76,2	3345	95,3	4184
	305		38,6	76,3	2945	91,5	3532	114,4	4416
63	076	38,0	312,0	19,0	5928	22,8	7114	28,5	8892
	089		260,0	22,3	5789	26,7	6942	33,4	8684
	102		221,0	25,5	5636	30,6	6763	38,3	8464
	115		187,0	28,8	5386	34,5	6452	43,1	8060
	127		168,0	31,8	5342	38,1	6401	47,6	7997
	152		136,0	38,0	5168	45,6	6202	57,0	7752
	178		114,0	44,5	5073	53,4	6088	66,8	7615
	203		100,0	50,8	5080	60,9	6090	76,1	7610
	229		89,2	57,3	5111	68,7	6128	85,9	7662
	254		78,4	63,5	4978	76,2	5974	95,3	7472
	305		64,7	76,3	4937	91,5	5920	114,4	7402

FE 833 SB

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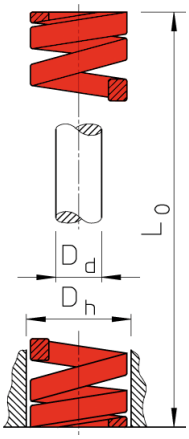
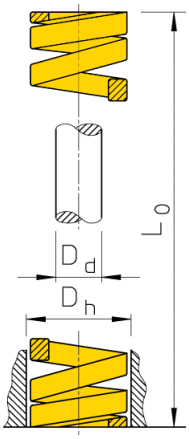


Dh mm	L0 mm	Dd mm	C N/mm	20% Arbeitsweg Working stroke mm	N	25% Arbeitsweg Working stroke mm	N	30% Arbeitsweg Working stroke mm	N
10	**025**	5,0	22,1	5,0	111	6,3	139	7,5	166
	032		17,5	6,4	112	8,0	140	9,6	168
	038		17,1	7,6	130	9,5	162	11,4	195
	044		15,0	8,8	132	11,0	165	13,2	198
	051		12,8	10,2	131	12,8	164	15,3	196
	064		10,7	12,8	137	16,0	171	19,2	205
	076		7,5	15,2	114	19,0	143	22,8	171
	305		2,1	61,0	128	76,3	160	91,5	192
13	**025**	6,3	42,1	5,0	211	6,3	265	7,5	316
	032		33,2	6,4	212	8,0	266	9,6	319
	038		29,3	7,6	223	9,5	278	11,4	334
	044		24,6	8,8	216	11,0	271	13,2	325
	051		19,6	10,2	200	12,8	251	15,3	300
	064		15,0	12,8	192	16,0	240	19,2	288
	076		13,2	15,2	201	19,0	251	22,8	301
	089		11,4	17,8	203	22,3	254	26,7	304
	102		8,4	20,4	171	25,5	214	30,6	257
	305		2,8	61,0	171	76,3	214	91,5	256
16	**025**	8,0	75,7	5,0	379	6,3	477	7,5	568
	032		52,8	6,4	338	8,0	422	9,6	507
	038		48,5	7,6	369	9,5	461	11,4	553
	044		42,8	8,8	377	11,0	471	13,2	565
	051		37,1	10,2	378	12,8	475	15,3	568
	064		30,3	12,8	388	16,0	485	19,2	582
	076		25,7	15,2	391	19,0	488	22,8	586
	089		21,7	17,8	386	22,3	484	26,7	579
	102		19,3	20,4	394	25,5	492	30,6	591
	115		15,7	23,0	361	28,8	452	34,5	542
	305		7,1	61,0	433	76,3	542	91,5	650
20	**025**	10,0	216,0	5,0	1080	6,3	1361	7,5	1620
	032		168,0	6,4	1075	8,0	1344	9,6	1613
	038		129,0	7,6	980	9,5	1226	11,4	1471
	044		112,0	8,8	986	11,0	1232	13,2	1478
	051		94,0	10,2	959	12,8	1203	15,3	1438
	064		72,1	12,8	923	16,0	1154	19,2	1384
	076		59,7	15,2	907	19,0	1134	22,8	1361
	089		50,5	17,8	899	22,3	1126	26,7	1348
	102		44,2	20,4	902	25,5	1127	30,6	1353
	115		38,4	23,0	883	28,8	1106	34,5	1325
	127		34,1	25,4	866	31,8	1084	38,1	1299
	139		31,2	27,8	868	34,8	1085	41,7	1302
	152		28,2	30,4	857	38,0	1072	45,6	1286
	305		15,0	61,0	915	76,3	1145	91,5	1373
25	**025**	12,5	375,1	5,0	1875	6,3	2363	7,5	2813
	032		297,0	6,4	1901	8,0	2376	9,6	2851
	038		219,0	7,6	1664	9,5	2081	11,4	2497
	044		187,0	8,8	1646	11,0	2057	13,2	2468
	051		156,0	10,2	1591	12,8	1997	15,3	2387
	064		123,0	12,8	1574	16,0	1968	19,2	2362

Dh mm	L0 mm	Dd mm	C N/mm	20% Arbeitsweg Working stroke mm	N	25% Arbeitsweg Working stroke mm	N	30% Arbeitsweg Working stroke mm	N
25	076	12,5	99,0	15,2	1505	19,0	1881	22,8	2257
	089		84,0	17,8	1495	22,3	1873	26,7	2243
	102		73,0	20,4	1489	25,5	1862	30,6	2234
	115		65,0	23,0	1495	28,8	1872	34,5	2243
	127		57,7	25,4	1466	31,8	1835	38,1	2198
	139		53,1	27,8	1476	34,8	1844	41,7	2213
	152		47,8	30,4	1453	38,0	1816	45,6	2180
	178		41,0	35,6	1460	44,5	1825	53,4	2189
	203		35,8	40,6	1453	50,8	1819	60,9	2180
	305		22,9	61,0	1397	76,3	1747	91,5	2095
32	038	16,0	388,0	7,6	2949	9,5	3686	11,4	4423
	044		324,0	8,8	2851	11,0	3564	13,2	4277
	051		272,0	10,2	2774	12,8	3482	15,3	4162
	064		212,0	12,8	2714	16,0	3392	19,2	4070
	076		172,0	15,2	2614	19,0	3268	22,8	3922
	089		141,0	17,8	2510	22,3	3144	26,7	3765
	102		122,0	20,4	2489	25,5	3111	30,6	3733
	115		107,0	23,0	2461	28,8	3082	34,5	3692
	127		93,0	25,4	2362	31,8	2957	38,1	3543
	139		86,6	27,8	2408	34,8	3010	41,7	3612
	152		78,0	30,4	2371	38,0	2964	45,6	3557
	178		67,2	35,6	2392	44,5	2990	53,4	3588
	203		59,1	40,6	2399	50,8	3002	60,9	3599
	254		46,4	50,8	2357	63,5	2946	76,2	3536
	305		38,0	61,0	2318	76,3	2899	91,5	3477
40	051	20,0	350,0	10,2	3570	12,8	4480	15,3	5355
	064		269,0	12,8	3443	16,0	4304	19,2	5165
	076		219,0	15,2	3329	19,0	4161	22,8	4993
	089		190,0	17,8	3382	22,3	4237	26,7	5073
	102		163,0	20,4	3325	25,5	4157	30,6	4988
	115		142,0	23,0	3266	28,8	4090	34,5	4899
	127		128,0	25,4	3251	31,8	4070	38,1	4877
	139		115,8	27,8	3220	34,8	4025	41,7	4830
	152		105,0	30,4	3192	38,0	3990	45,6	4788
	178		89,0	35,6	3168	44,5	3961	53,4	4753
	203		77,0	40,6	3126	50,8	3912	60,9	4689
	254		61,0	50,8	3099	63,5	3874	76,2	4648
	305		51,0	61,0	3111	76,3	3891	91,5	4667
50	064	25,0	413,0	12,8	5286	16,0	6608	19,2	7930
	076		339,0	15,2	5153	19,0	6441	22,8	7729
	089		288,0	17,8	5126	22,3	6408	26,7	7690
	102		245,0	20,4	4998	25,5	6248	30,6	7497
	115		215,0	23,0	4945	28,8	6182	34,5	7418
	127		192,0	25,4	4877	31,8	6096	38,1	7315
	139		169,2	27,8	4704	34,8	5880	41,7	7056
	152		154,0	30,4	4682	38,0	5852	45,6	7022
	178		134,0	35,6	4770	44,5	5963	53,4	7156
	203		117,0	40,6	4750	50,8	5938	60,9	7125
	254		89,0	50,8	4521	63,5	5652	76,2	6782
	305		73,0	61,0	4453	76,3	5567	91,5	6680
63	076	38,0	618,0	15,2	9394	19,0	11742	22,8	14090
	089		515,0	17,8	9167	22,3	11485	26,7	13751
	102		438,0	20,4	8935	25,5	11169	30,6	13403
	115		370,0	23,0	8510	28,8	10656	34,5	12765
	127		333,0	25,4	8458	31,8	10589	38,1	12687
	152		269,0	30,4	8178	38,0	10222	45,6	12266
	178		226,0	35,6	8046	44,5	10057	53,4	12068
	203		198,0	40,6	8039	50,8	10058	60,9	12058
	254		155,0	50,8	7874	63,5	9843	76,2	11811
	305		128,0	61,0	7808	76,3	9766	91,5	11712

FE 834 BB

FE 834 BB / 10 x 025



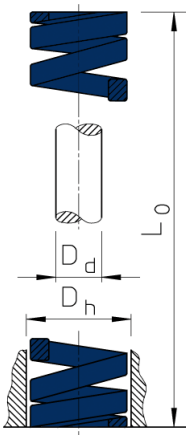
Dh mm	L0 mm	Dd mm	C N/mm	17% Arbeitsweg Working stroke mm	N	20% Arbeitsweg Working stroke mm	N	25% Arbeitsweg Working stroke mm	N
10	**025**	5,0	36,8	4,3	158	5,0	184	6,3	232
	032		27,9	5,4	151	6,4	179	8,0	223
	038		23,7	6,5	154	7,6	180	9,5	225
	044		19,2	7,5	144	8,8	169	11,0	211
	051		16,5	8,7	144	10,2	168	12,8	211
	064		13,2	10,9	144	12,8	169	16,0	211
	076		10,9	12,9	141	15,2	166	19,0	207
	305		2,6	51,9	135	61,0	159	76,3	198
13	**025**	6,3	58,5	4,3	252	5,0	293	6,3	369
	032		43,9	5,4	237	6,4	281	8,0	351
	038		36,0	6,5	234	7,6	274	9,5	342
	044		30,3	7,5	227	8,8	267	11,0	333
	051		26,2	8,7	228	10,2	267	12,8	335
	064		21,2	10,9	231	12,8	271	16,0	339
	076		17,1	12,9	221	15,2	260	19,0	325
	089		14,5	15,1	219	17,8	258	22,3	323
	102		12,7	17,3	220	20,4	259	25,5	324
	305		4,3	51,9	223	61,0	262	76,3	328
16	**025**	8,0	118,0	4,3	507	5,0	590	6,3	743
	032		89,0	5,4	481	6,4	570	8,0	712
	038		72,1	6,5	469	7,6	548	9,5	685
	044		60,9	7,5	457	8,8	536	11,0	670
	051		52,3	8,7	455	10,2	533	12,8	669
	064		41,2	10,9	449	12,8	527	16,0	659
	076		34,1	12,9	440	15,2	518	19,0	648
	089		29,5	15,1	445	17,8	525	22,3	658
	102		25,6	17,3	443	20,4	522	25,5	653
	115		22,4	19,6	439	23,0	515	28,8	645
	305		8,4	51,9	436	61,0	512	76,3	641
20	**025**	10,0	293,0	4,3	1260	5,0	1465	6,3	1846
	032		224,0	5,4	1210	6,4	1434	8,0	1792
	038		177,0	6,5	1151	7,6	1345	9,5	1682
	044		149,0	7,5	1118	8,8	1311	11,0	1639
	051		128,0	8,4	1114	10,2	1306	12,8	1638
	064		99,0	10,9	1079	12,8	1267	16,0	1584
	076		81,7	12,9	1054	15,2	1242	19,0	1552
	089		69,5	15,1	1049	17,8	1237	22,3	1550
	102		60,6	17,3	1048	20,4	1236	25,5	1545
	115		53,0	19,6	1039	23,0	1219	28,8	1526
	127		47,5	21,6	1026	25,4	1207	31,8	1511
	139		43,3	23,6	1023	27,8	1204	34,8	1505
	152		39,0	25,8	1006	30,4	1186	38,0	1482
	305		21,2	51,9	1100	61,0	1293	76,3	1618
25	**025**	12,5	459,0	4,3	1974	5,0	2295	6,3	2892
	032		374,4	5,4	2022	6,4	2396	8,0	2995
	038		346,0	6,5	2249	7,6	2630	9,5	3287
	044		244,0	7,5	1830	8,8	2147	11,0	2684
	051		207,5	8,7	1805	10,2	2117	12,8	2656
	064		161,0	10,9	1755	12,8	2061	16,0	2576

Dh mm	L0 mm	Dd mm	C N/mm	17% Arbeitsweg Working stroke mm	N	20% Arbeitsweg Working stroke mm	N	25% Arbeitsweg Working stroke mm	N
25	076	12,5	130,8	12,9	1687	15,2	1988	19,0	2485
	089		110,7	15,1	1663	17,8	1967	22,3	2464
	102		96,3	17,3	1666	20,4	1965	25,5	2456
	115		85,7	19,6	1680	23,0	1971	28,8	2468
	127		76,3	21,6	1648	25,4	1938	31,8	2426
	139		69,4	23,6	1640	27,8	1929	34,8	2412
	152		63,5	25,8	1638	30,4	1930	38,0	2413
	178		53,9	30,3	1633	35,6	1919	44,5	2399
	203		47,0	34,5	1622	40,6	1908	50,8	2388
	305		30,9	51,9	1604	61,0	1885	76,3	2358
32	038	16,0	528,2	6,5	3433	7,6	4014	9,5	5018
	044		424,4	7,5	3183	8,8	3735	11,0	4668
	051		353,0	8,7	3071	10,2	3601	12,8	4518
	064		269,2	10,9	2934	12,8	3446	16,0	4307
	076		218,5	12,9	2819	15,2	3321	19,0	4152
	089		180,3	15,1	2723	17,8	3209	22,3	4021
	102		155,0	17,3	2682	20,4	3162	25,5	3953
	115		140,0	19,6	2744	23,0	3220	28,8	4032
	127		124,0	21,6	2678	25,4	3150	31,8	3943
	139		113,1	23,6	2673	27,8	3144	34,8	3931
	152		102,0	25,8	2632	30,4	3101	38,0	3876
	178		88,2	30,3	2672	35,6	3140	44,5	3925
	203		76,0	34,5	2622	40,6	3086	50,8	3861
	254		60,8	43,2	2627	50,8	3089	63,5	3861
	305		49,0	51,9	2543	61,0	2989	76,3	3739
40	051	20,0	628,0	8,7	5464	10,2	6406	12,8	8038
	064		487,0	10,9	5308	12,8	6234	16,0	7792
	076		379,0	12,9	4889	15,2	5761	19,0	7201
	089		321,0	15,1	4847	17,8	5714	22,3	7158
	102		281,0	17,3	4861	20,4	5732	25,5	7166
	115		245,0	19,6	4802	23,0	5635	28,8	7056
	127		221,0	21,6	4774	25,4	5613	31,8	7028
	139		191,4	23,6	4522	27,8	5320	34,8	6650
	152		168,0	25,8	4334	30,4	5107	38,0	6384
	178		146,0	30,3	4424	35,6	5198	44,5	6497
	203		132,0	34,5	4554	40,6	5359	50,8	6706
	254		107,0	43,2	4622	50,8	5436	63,5	6795
	305		87,8	51,9	4557	61,0	5356	76,3	6699
50	064	25,0	709,0	10,9	7728	12,8	9075	16,0	11344
	076		572,0	12,9	7379	15,2	8694	19,0	10868
	089		475,0	15,1	7173	17,8	8455	22,3	10593
	102		405,0	17,3	7007	20,4	8262	25,5	10328
	115		352,0	19,6	6899	23,0	8096	28,8	10138
	127		316,0	21,6	6826	25,4	8026	31,8	10049
	139		276,0	23,6	6521	27,8	7672	34,8	9590
	152		239,0	25,8	6166	30,4	7266	38,0	9082
	178		215,0	30,3	6515	35,6	7654	44,5	9568
	203		187,0	34,5	6452	40,6	7592	50,8	9500
	254		153,0	43,5	6610	50,8	7772	63,5	9716
	305		127,0	51,9	6591	61,0	7747	76,3	9690
63	076*	38,0	952,0	12,9	12280	15,2	14470	-	-
	089*		819,0	15,1	12360	17,8	14580	-	-
	102		700,0	17,3	12110	20,4	14280	25,5	17850
	115		620,0	19,6	12152	23,0	14260	28,8	17860
	127		565,0	21,6	12204	25,4	14351	31,8	17967
	152		458,0	25,8	11816	30,4	13923	38,0	17404
	178		384,0	30,3	11635	35,6	13670	44,5	17088
	203		337,0	34,5	11627	40,6	13682	50,8	17120
	254		263,0	43,2	11362	50,8	13360	63,5	16701
	305		218,0	51,9	11314	61,0	13298	76,3	16633

* = max. Federweg 20% / * = max. spring deflection 20%

FE 835 LB

FE 835 LB / 10 x 025

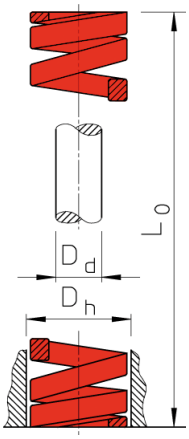


Dh mm	L0 mm	Dd mm	C N/mm	25% Arbeitsweg Working stroke mm	N	40% Arbeitsweg Working stroke mm	N	50% Arbeitsweg Working stroke mm	N
10	**025**	5,0	14,4	6,3	90	10,0	144	12,5	180
	032		12,3	8,0	99	12,8	158	16,0	197
	038		9,8	9,5	93	15,2	149	19,0	186
	044		8,8	11,0	97	17,6	155	22,0	194
	051		7,5	12,8	96	20,4	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	12,5	663
	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

D_h	L_0	D_d	C	25% Arbeitsweg Working stroke		40% Arbeitsweg Working stroke		50% Arbeitsweg Working stroke	
mm	mm	mm	N/mm	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	25,5	2076
	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	32,0	5021
	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 mm	L0 mm	Dd mm	C N/mm	20% Arbeitsweg Working stroke mm	N	25% Arbeitsweg Working stroke mm	N	37% Arbeitsweg Working stroke 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	9,3	921
	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 mm	L0 mm	Dd mm	C N/mm	20% Arbeitsweg Working stroke mm	N	25% Arbeitsweg Working stroke mm	N	37% Arbeitsweg Working stroke 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	18,9	3374
	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	23,7	4996
	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

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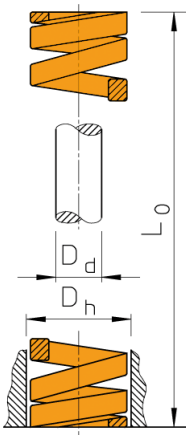

Dh mm	L0 mm	Dd mm	C N/mm	15% Arbeitsweg Working stroke mm	N	20% Arbeitsweg Working stroke mm	N	30% Arbeitsweg Working stroke mm	N
10	**025**	5,0	22,5	3,8	85	5,0	113	7,5	169
	032		18,6	4,8	90	6,4	119	9,6	179
	038		15,9	5,7	91	7,6	121	11,4	181
	044		13,7	6,6	91	8,8	121	13,2	181
	051		11,8	7,7	90	10,2	120	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	7,5	1361
	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	L0	Dd	C	15% Arbeitsweg Working stroke		20% Arbeitsweg Working stroke		30% Arbeitsweg Working stroke	
mm	mm	mm	N/mm	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	15,3	4801
	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	19,2	7532
	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

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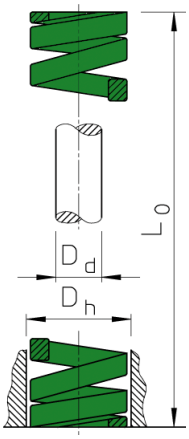


Dh mm	L0 mm	Dd mm	C N/mm	15% Arbeitsweg Working stroke mm	N	20% Arbeitsweg Working stroke mm	N	25% Arbeitsweg Working stroke mm	N
10	**025**	5,0	38,9	3,8	146	5,0	194	6,3	243
	032		29,8	4,8	143	6,4	190	8,0	238
	038		25,4	5,7	145	7,6	193	9,5	241
	044		20,2	6,6	133	8,8	178	11,0	222
	051		17,6	7,7	135	10,2	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	6,3	1297
	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

D_h	L_0	D_d	C	15% Arbeitsweg Working stroke		20% Arbeitsweg Working stroke		25% Arbeitsweg Working stroke	
mm	mm	mm	N/mm	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	12,8	6904
	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	16,0	10325
	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

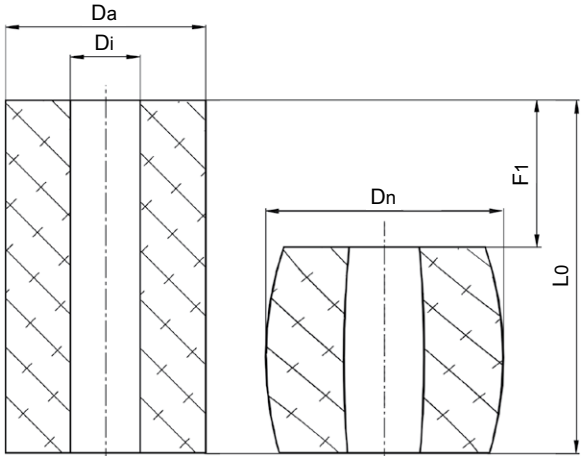
Mat.: Elastomere / Ultraflex 92
Härte: 92 ±5 Shore

Elastomer-Federn haben eine Setzneigung, die abhängig vom Wärme, Federweg und Hubgeschwindigkeit ist. Sie beträgt ca. 5-8% der Federlänge L_0.

Mat.: Elastomer / Ultraflex 92
Hardness: 92 ±5 Shore

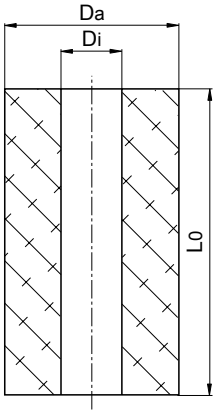
Elastomer springs do have a settling characteristic of around 5-8 % of the intial total length L_0, depending on temperature, stroke length and speed.

FE 802 / 040 x 32



Da	L0	Di	Dn	Fmax. 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
	40	8,5	26	12,0
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
	40	10,5	33	12,0
	50	10,5	33	15,0
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
	40	13,5	42	12,0
	50	13,5	42	15,0
	63	13,5	42	18,9
	80	13,5	42	24,0
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
	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	L0	Di	Dn	Fmax. 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
	80	17,0	65	24,0
	100	17,0	65	30,0
063	32	17,0	82	9,6
	40	17,0	82	12,0
	50	17,0	82	15,0
	63	17,0	82	18,9
	80	17,0	82	24,0
	100	17,0	82	30,0
080	32	21,0	104	9,6
	40	21,0	104	12,0
	50	21,0	104	15,0
	63	21,0	104	18,9
	80	21,0	104	24,0
	100	21,0	104	30,0
100	50	21,0	130	15,0
	63	21,0	130	18,9
	80	21,0	130	24,0
	100	21,0	130	30,0
125	50	27,0	160	15,0
	63	27,0	160	18,9
	80	27,0	160	24,0
	100	27,0	160	30,0
	100	27,0	160	30,0



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

Führungsbolzen für Elastomerfedern

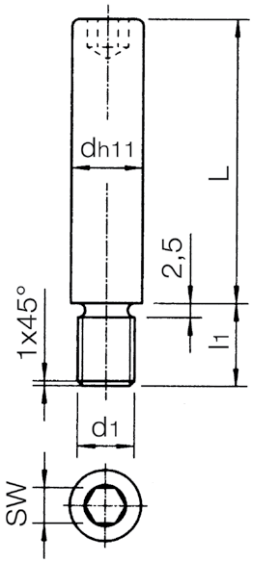
Guide pins for elastomer - springs

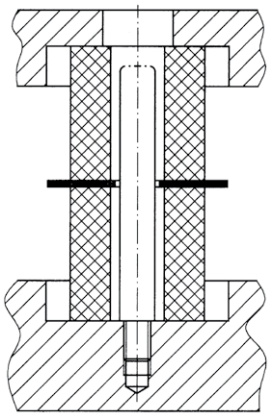
FE 816

Mat.: C15

Mat.: C15

FE 816 / 06 x 020





d	d1	l1	SW	E +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

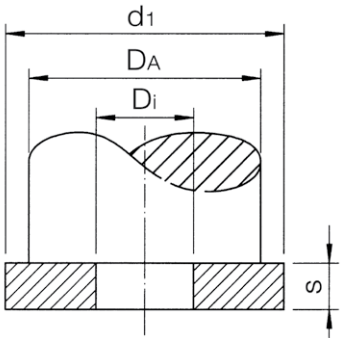
Spring washers, DIN ISO 10069-2 for elastomer - springs

FE 815

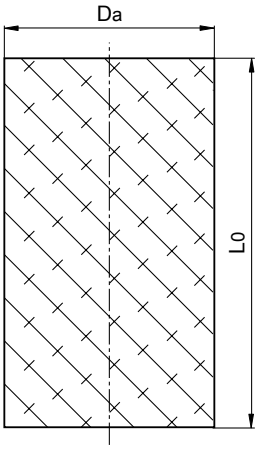
Mat.: MS 58

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	L0
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	L0
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

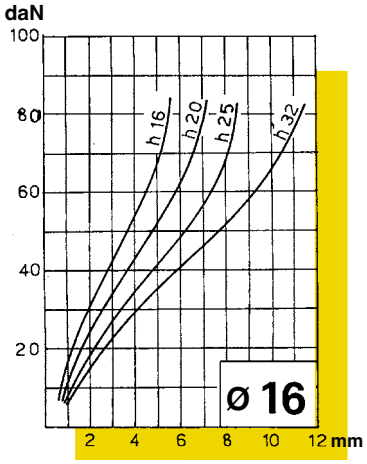
Mat.: Elastomer / Ultraflex
Hardness: 94 Shore

FE 809 / 040

Kennfarbe grün

Color code green

Da	L0
016	250
020	250
025	250
032	500
040	500
050	500
063	500
080	500
100	500
125	500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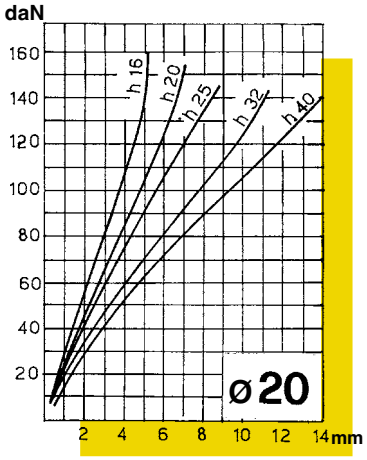
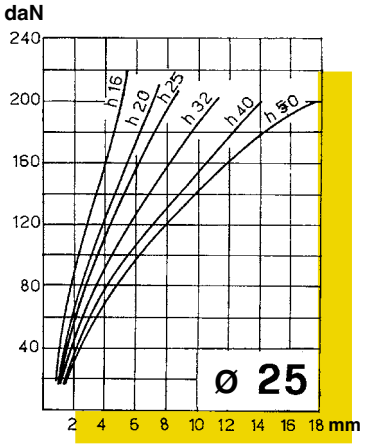
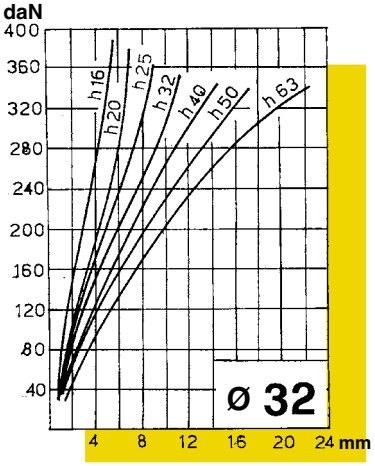
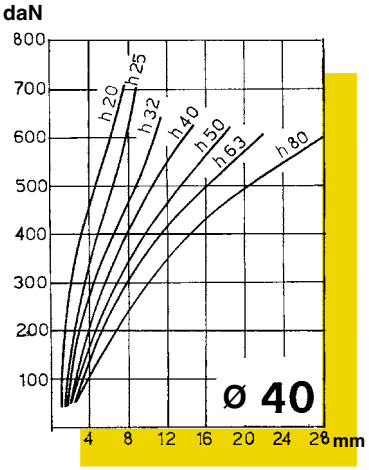
100
80
60
40
20
h 16
h 20
h 25
h 32
ø 16
2 4 6 8 10 12 mm


daN
160
140
120
100
80
60
40
20
h 16
h 20
h 25
h 32
h 40
ø 20
2 4 6 8 10 12 14 mm


daN
240
200
160
120
80
40
h 16
h 20
h 25
h 32
h 40
h 50
ø 25
2 4 6 8 10 12 14 16 18 mm


daN
400
360
320
280
240
200
160
120
80
40
h 16
h 20
h 25
h 32
h 40
h 50
h 63
ø 32
4 8 12 16 20 24 mm


daN
800
700
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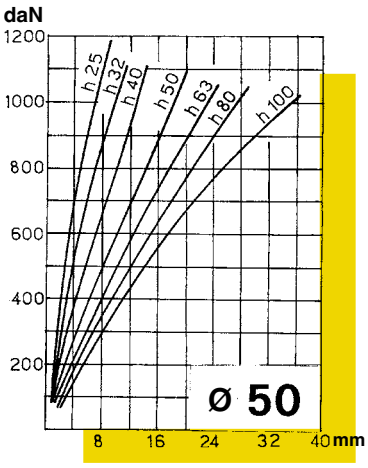
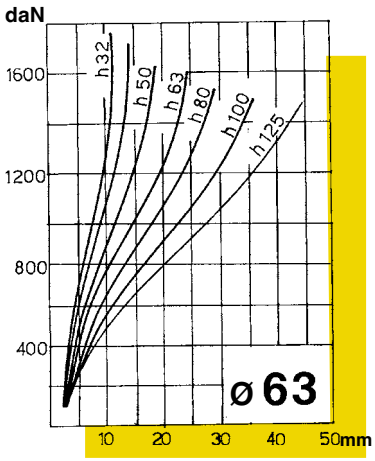
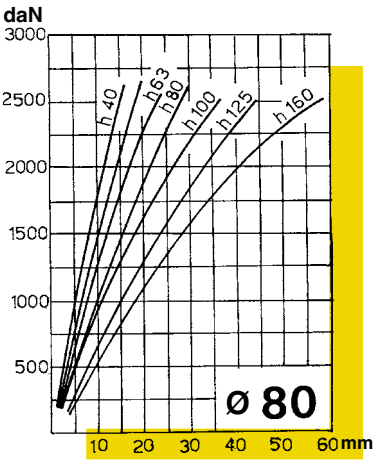
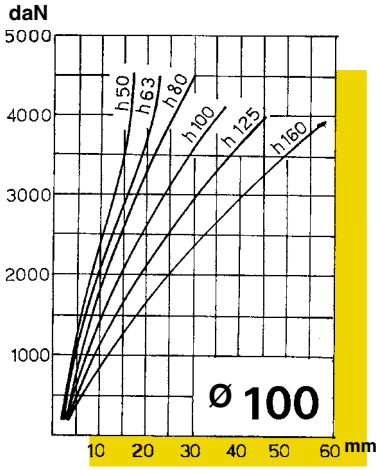
500
400
300
200
100
h 20
h 25
h 32
h 40
h 50
h 63
h 80
ø 40
4 8 12 16 20 24 28 mm


daN
1200
1000
800
600
400
200
h 25
h 32
h 40
h 50
h 63
h 80
h 100
ø 50
8 16 24 32 40 mm


daN
1600
1200
800
400
h 32
h 50
h 63
h 80
h 100
h 125
ø 63
10 20 30 40 50 mm


daN
3000
2500
2000
1500
1000
500
h 40
h 63
h 80
h 100
h 125
h 160
ø 80
10 20 30 40 50 60 mm


daN
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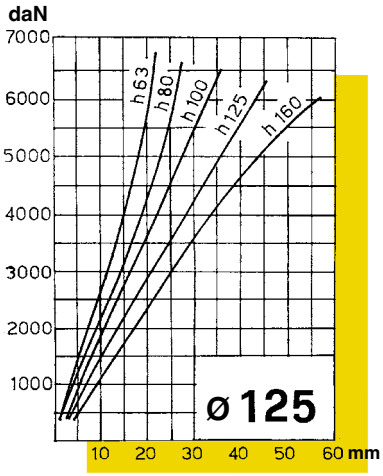
4000
3000
2000
1000
h 50
h 63
h 80
h 100
h 125
h 160
ø 100
10 20 30 40 50 60 mm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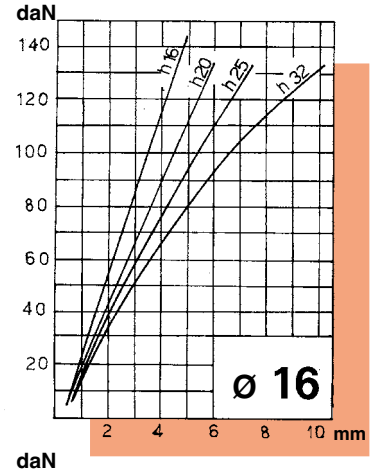
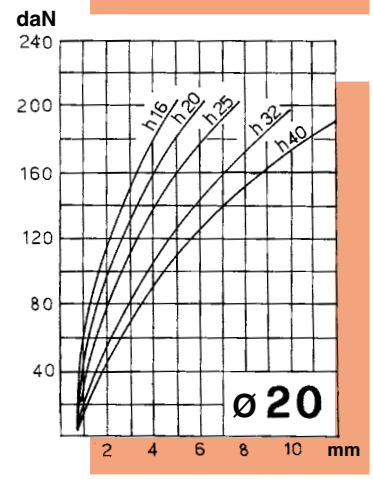
5000
4000
3000
2000
1000
h 63
h 80
h 100
h 125
h 160
ø 125
10 20 30 40 50 60 mm


daN
140
120
100
80
60
40
20
h16
h20
h25
h32
ø 16
2
4
6
8
10
mm


daN
240
200
160
120
80
40
h16
h20
h25
h32
h40
ø 20
2
4
6
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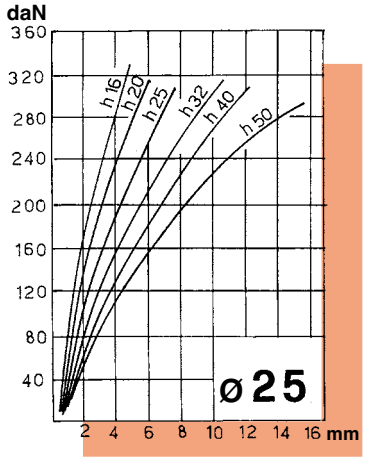
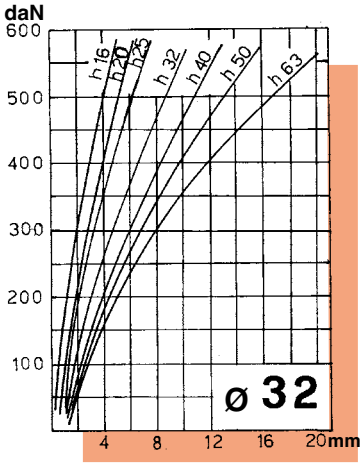
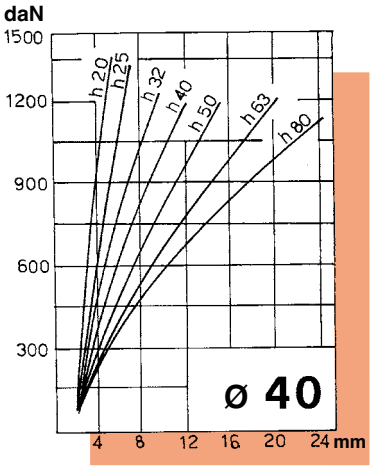
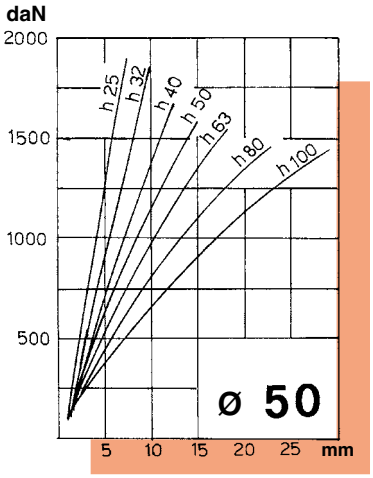
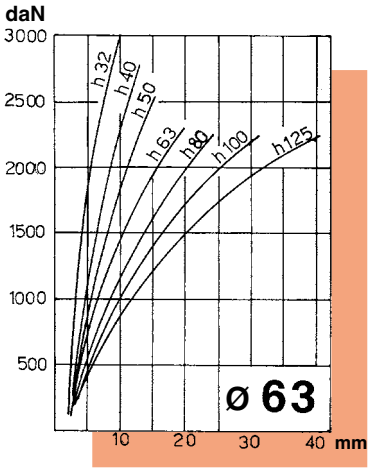
mm

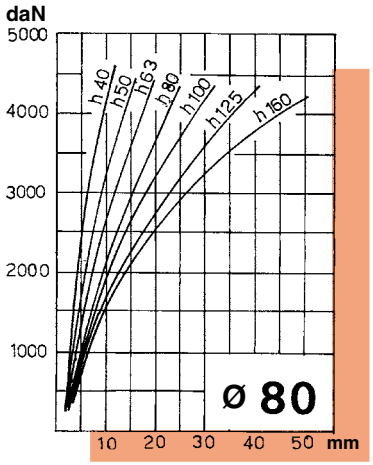

daN
360
320
280
240
200
160
120
80
40
h16
h20
h25
h32
h40
h50
ø 25
2
4
6
8
10
12
14
16
mm

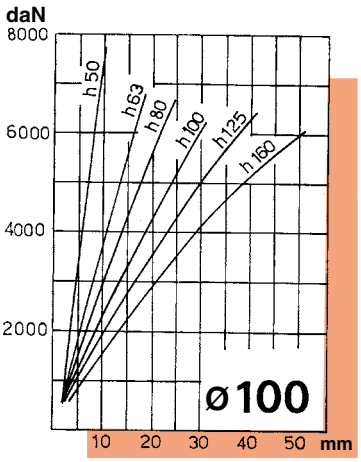

daN
600
500
400
300
200
100
h16
h20
h25
h32
h40
h50
h63
ø 32
4
8
12
16
20
mm

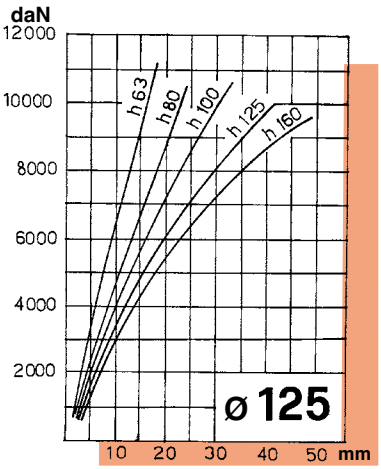

daN
1500
1200
900
600
300
h20
h25
h32
h40
h50
h63
h80
ø 40
4
8
12
16
20
24
mm


daN
2000
1500
1000
500
h25
h32
h40
h50
h63
h80
h100
ø 50
5
10
15
20
25
mm

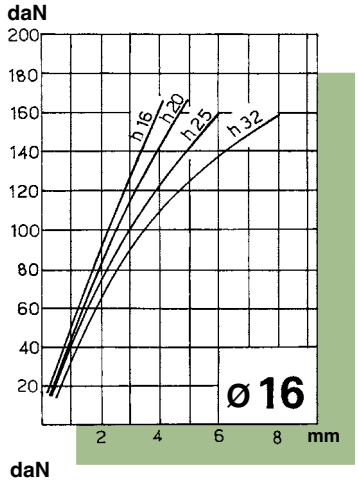

daN
3000
2500
2000
1500
1000
500
h32
h40
h50
h63
h80
h100
h125
ø 63
10
20
30
40
mm

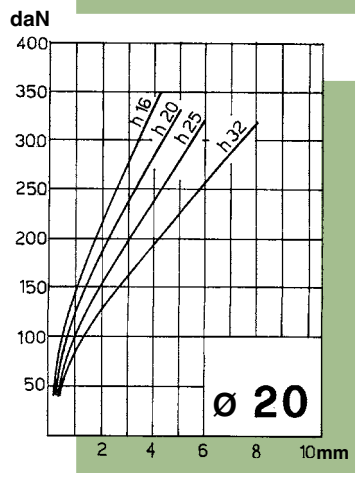

daN
5000
4000
3000
2000
1000
h40
h50
h63
h80
h100
h125
h160
ø 80
10
20
30
40
50
mm

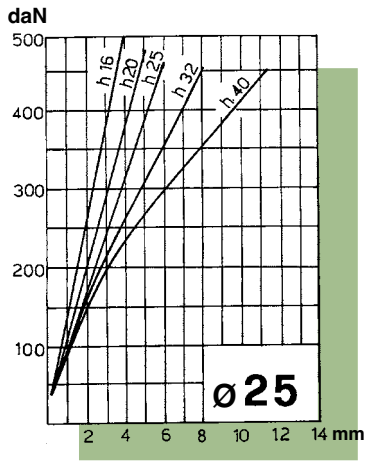

daN
8000
6000
4000
2000
h50
h63
h80
h100
h125
h160
ø100
10
20
30
40
50
mm

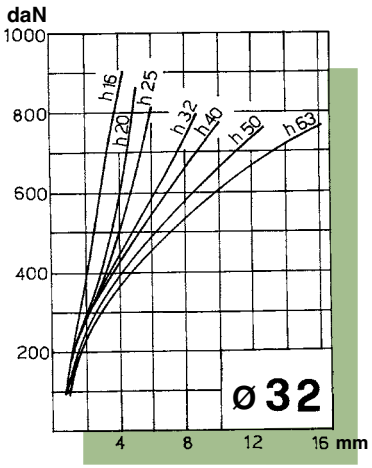

daN
12000
10000
8000
6000
4000
2000
h63
h80
h100
h125
h160
ø 125
10
20
30
40
50
mm

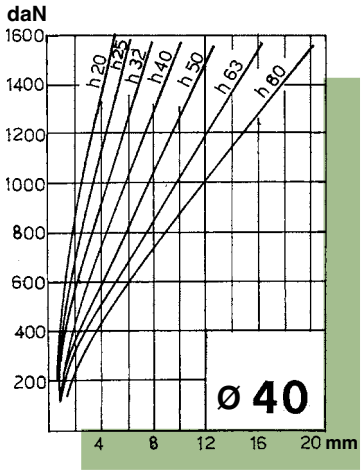
[FE]

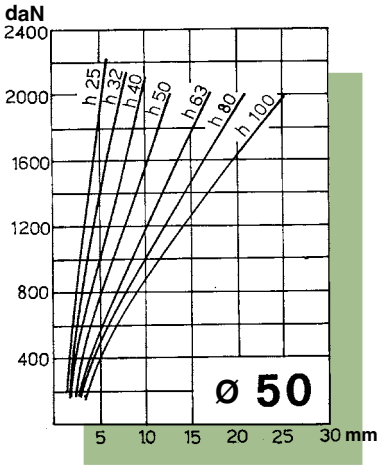

daN
200
180
160
140
120
100
80
60
40
20
h 16
h 20
h 25
h 32
ø 16
2
4
6
8
mm

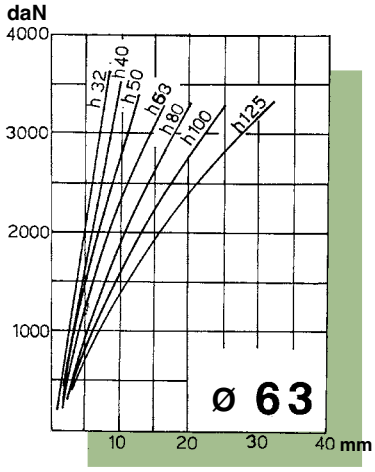

daN
400
350
300
250
200
150
100
50
h 16
h 20
h 25
h 32
ø 20
2
4
6
8
10mm

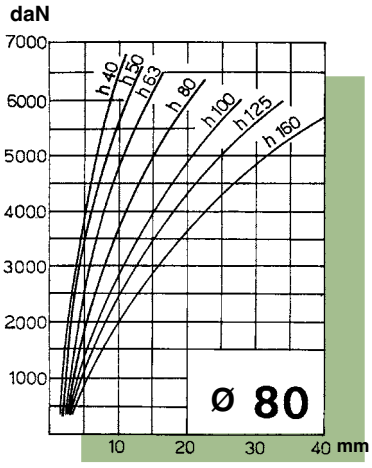

daN
500
400
300
200
100
h 16
h 20
h 25
h 32
h 40
ø 25
2
4
6
8
10
12
14 mm

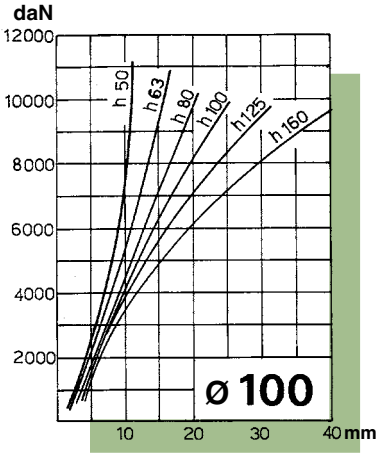

daN
1000
800
600
400
200
h 16
h 20
h 25
h 32
h 40
h 50
h 63
ø 32
4
8
12
16 mm

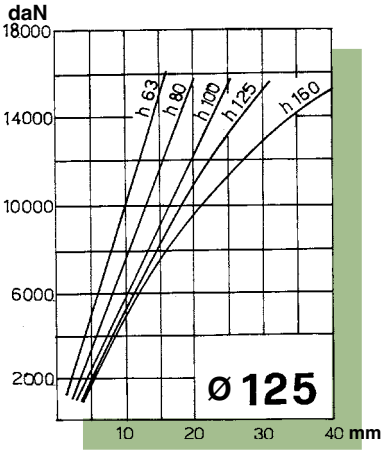

daN
1600
1400
1200
1000
800
600
400
200
h 20
h 25
h 32
h 40
h 50
h 63
h 80
ø 40
4
8
12
16
20 mm


daN
2400
2000
1600
1200
800
400
h 25
h 32
h 40
h 50
h 63
h 80
h 100
ø 50
5
10
15
20
25
30 mm


daN
4000
3000
2000
1000
h 32
h 40
h 50
h 63
h 80
h 100
h 125
ø 63
10
20
30
40 mm


daN
7000
6000
5000
4000
3000
2000
1000
h 40
h 50
h 63
h 80
h 100
h 125
h 160
ø 80
10
20
30
40 mm


daN
12000
10000
8000
6000
4000
2000
h 50
h 63
h 80
h 100
h 125
h 160
ø 100
10
20
30
40 mm


daN
18000
14000
10000
6000
2000
h 63
h 80
h 100
h 125
h 160
ø 125
10
20
30
40 mm