



**COMPRESSION DIE SPRINGS
WIRE SPRINGS
ELASTOMER SPRINGS**



OCTOBER 2017





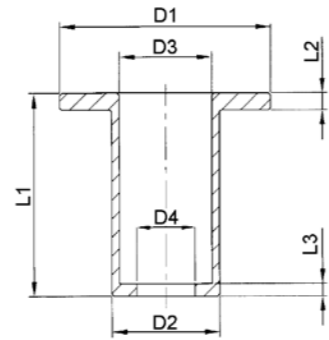
COMPRESSION DIE SPRINGS
WIRE SPRINGS
ELASTOMER SPRINGS

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Preloaded springs offer key benefits

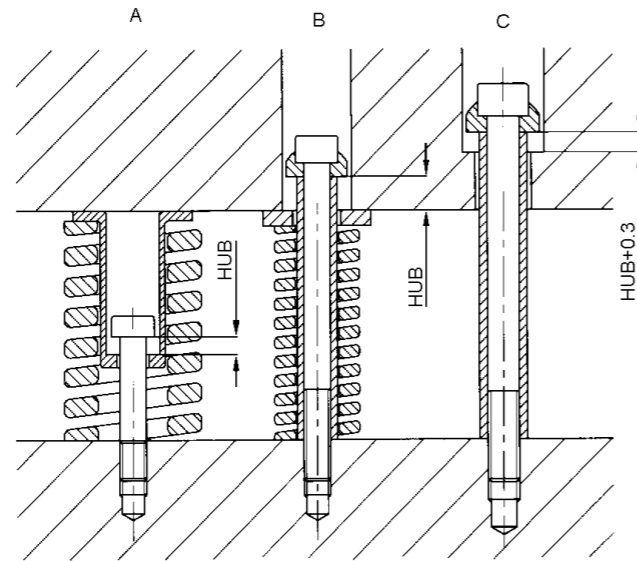
Each spring is individually attached and pre-loaded to the desired length.
When assembling the tool, there is no need to compress all of the springs.
In the resting position, the springs are not preloaded by the retainer.
This saves time and improves safety during assembly and maintenance operations.

D1	D2	D3	D4	L1	L2	L3	Reference
37	20	16,5	10	48	3	4	FH2
49	25	21,5	13,5	48	4	3	FH3
49	25	21,5	13,5	73	4	3	FH4



Assembly examples

- A** Preloaded spring with FHx retainer and A17.xxx.xxx shoulder screw
- B** Preloaded spring with S65.010.xxx washer and A15.xxx.xxx locking grub screw
- C** Travel is restricted using an A15.xxx.xxx locking grub screw



Elastomer rods are available in two hardness qualities.

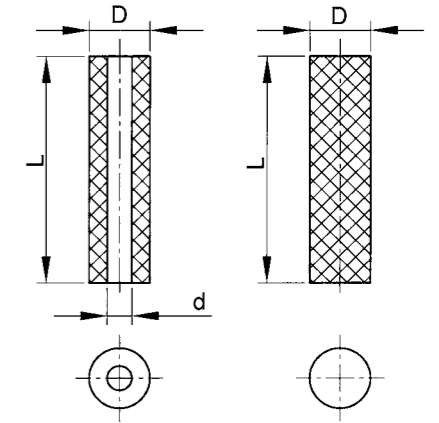
80 Shore A
Maximum travel: 35%
Compaction under compression: 5-7%

90 Shore A
Maximum travel: 30%
Compaction under compression: 6-8%

Ordering example:

Solid 80 rod, Shore A, ØD=16 L=300

Please state: **S68.016.300**



S66.xxx.xxx
S67.xxx.xxx

S68.xxx.xxx
S69.xxx.xxx

D	d	L	80 Shore A Reference Hollow rod	90 Shore A Reference Hollow rod
16	6,5	300	S66.016.300	S67.016.300
20	8,5	300	S66.020.300	S67.020.300
25	10,5	300	S66.025.300	S67.025.300
32	13,5	300	S66.032.300	S67.032.300
40	13,5	300	S66.040.300	S67.040.300
50	17	400	S66.050.400	S67.050.400
63	17	400	S66.063.400	S67.063.400
80	21	400	S66.080.400	S67.080.400
100	21	300	S66.100.300	S67.100.300
125	27	300	S66.125.300	S67.125.300

D	L	80 Shore A Reference Solid rod	90 Shore A Reference Solid rod
16	300	S68.016.300	S69.016.300
20	300	S68.020.300	S69.020.300
25	300	S68.025.300	S69.025.300
32	300	S68.032.300	S69.032.300
40	300	S68.040.300	S69.040.300
50	400	S68.050.400	S69.050.400
63	400	S68.063.400	S69.063.400
80	400	S68.080.400	S69.080.400
100	300	S68.100.300	S69.100.300
125	300	S68.125.300	S69.125.300

Processing	80 Shore A	90 Shore A
Sawing	+	+
Cutting	++	++
Drilling	0	+
Reaming	++	++
Lathe turning	0	+
Milling	+	++
Grinding	+	+
Tapping	-	-

Resistance	80 Shore A	90 Shore A
Lubricant	+	+
Grease	+	+
Alcohol	+	+
Thinner	+	+
Water	-	-
Ozone	+	+
Lye	-	-
Acids	-	-

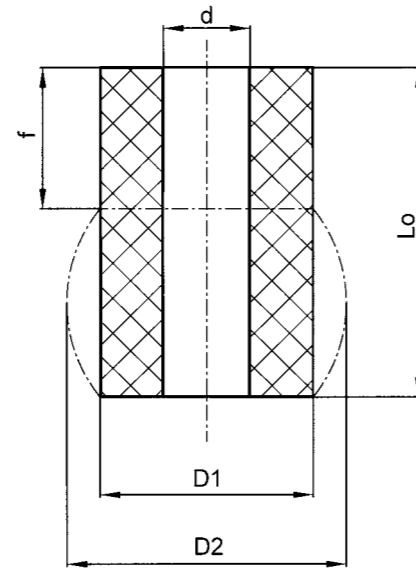
++ Very good + Good 0 Satisfactory - Subject to reserv.

When manufacturing special springs, the length L must not be exceeded

+ Good - Subject to reservations

Elastomer springs

Hardness: 70 Shore A
 Max. compression: 40% of Lo
 Max. permissible temperature: 80°C
 D2: Footprint diameter when compressed to 40% of Lo

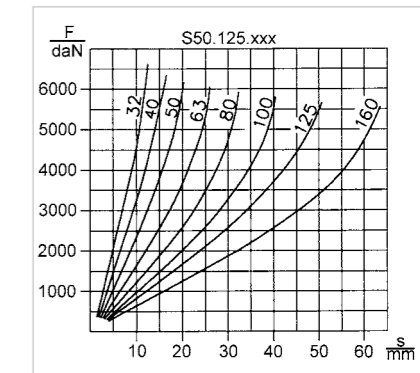
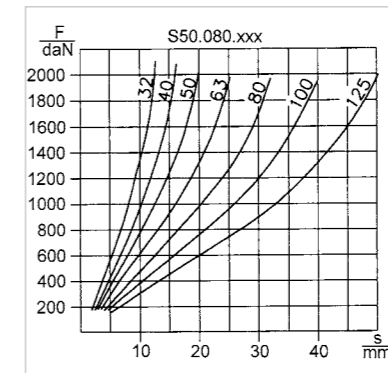
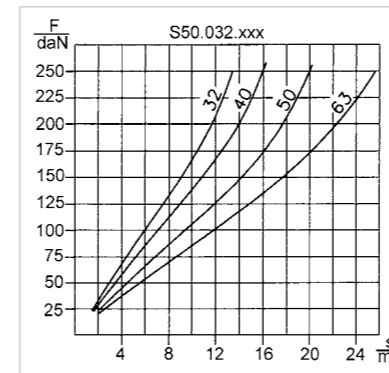
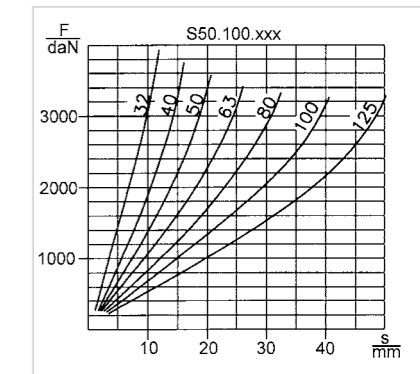
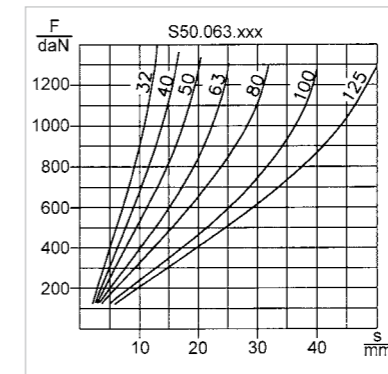
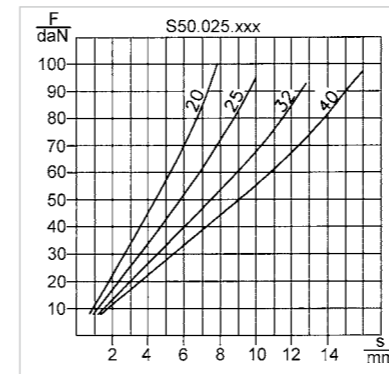
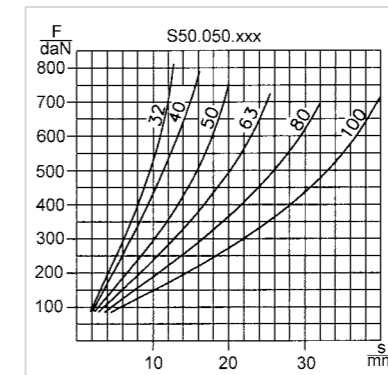
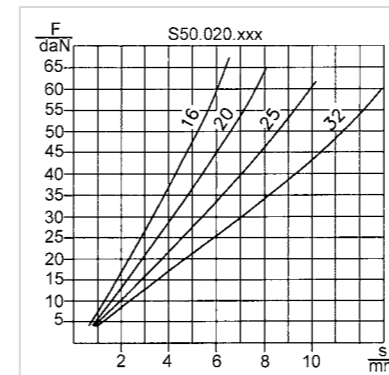
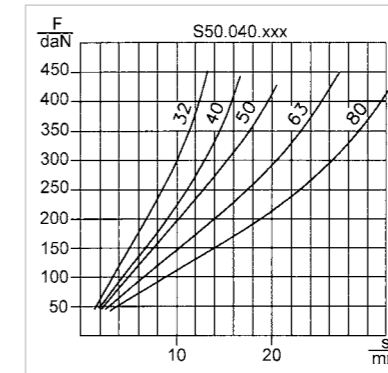
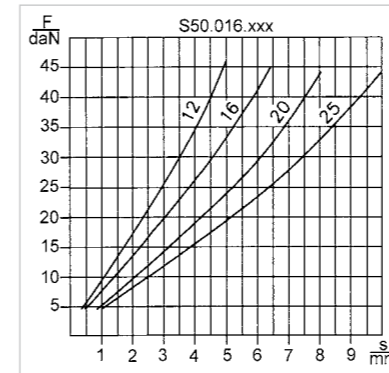


Ordering example:
 Spring Ø D1=16 Lo=12

Please state
 S50.016.012

D1	d	D2 fmax	Lo	Reference
16	6,5	23	12	S50.016.012
16	6,5	23	16	S50.016.016
16	6,5	23	20	S50.016.020
16	6,5	23	25	S50.016.025
20	8,5	28	16	S50.020.016
20	8,5	28	20	S50.020.020
20	8,5	28	25	S50.020.025
20	8,5	28	32	S50.020.032
25	10,5	35	20	S50.025.020
25	10,5	35	25	S50.025.025
25	10,5	35	32	S50.025.032
25	10,5	35	40	S50.025.040
32	13,5	45	32	S50.032.032
32	13,5	45	40	S50.032.040
32	13,5	45	50	S50.032.050
32	13,5	45	63	S50.032.063
40	13,5	56	32	S50.040.032
40	13,5	56	40	S50.040.040
40	13,5	56	50	S50.040.050
40	13,5	56	63	S50.040.063
40	13,5	56	80	S50.040.080
50	17	70	32	S50.050.032
50	17	70	40	S50.050.040
50	17	70	50	S50.050.050
50	17	70	63	S50.050.063
50	17	70	80	S50.050.080
50	17	70	100	S50.050.100

D1	d	D2 fmax	Lo	Reference
63	17	89	32	S50.063.032
63	17	89	40	S50.063.040
63	17	89	50	S50.063.050
63	17	89	63	S50.063.063
63	17	89	80	S50.063.080
63	17	89	100	S50.063.100
63	17	89	125	S50.063.125
80	21	112	32	S50.080.032
80	21	112	40	S50.080.040
80	21	112	50	S50.080.050
80	21	112	63	S50.080.063
80	21	112	80	S50.080.080
80	21	112	100	S50.080.100
80	21	112	125	S50.080.125
100	21	140	32	S50.100.032
100	21	140	40	S50.100.040
100	21	140	50	S50.100.050
100	21	140	63	S50.100.063
100	21	140	80	S50.100.080
100	21	140	100	S50.100.100
100	21	140	125	S50.100.125
125	27	175	32	S50.125.032
125	27	175	40	S50.125.040
125	27	175	50	S50.125.050
125	27	175	63	S50.125.063
125	27	175	100	S50.125.100
125	27	175	125	S50.125.125
125	27	175	160	S50.125.160

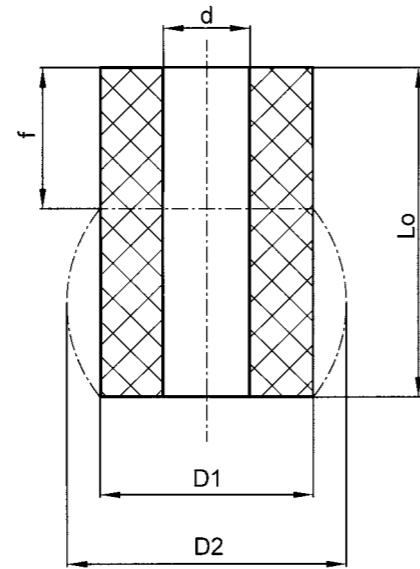


Elastomer springs

Hardness: 90 Shore A
 Max. compression: 30% of L_0
 Max. permissible temperature: 80°C
 D2: Footprint diameter when compressed to 30% of L_0

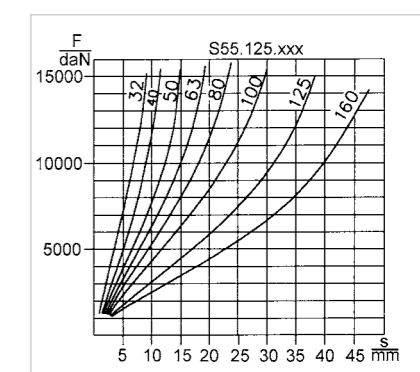
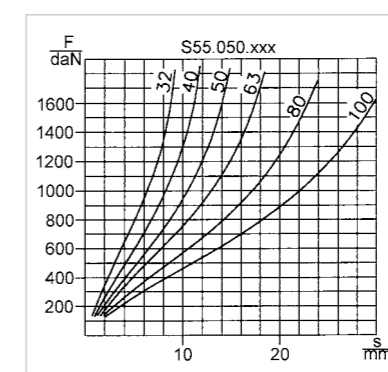
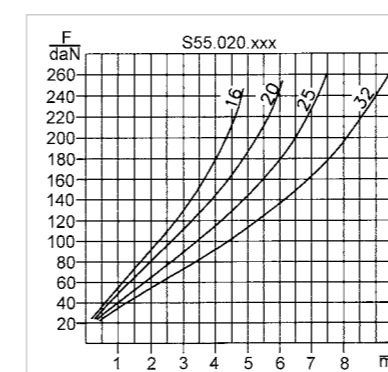
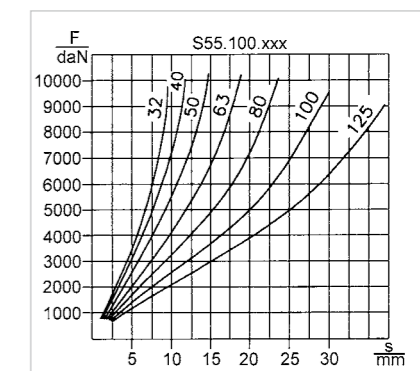
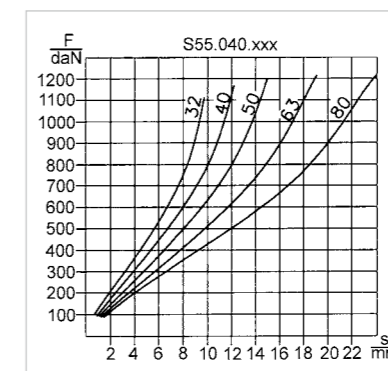
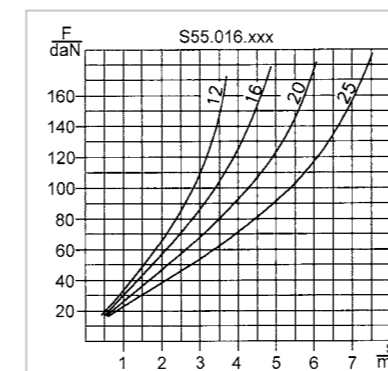
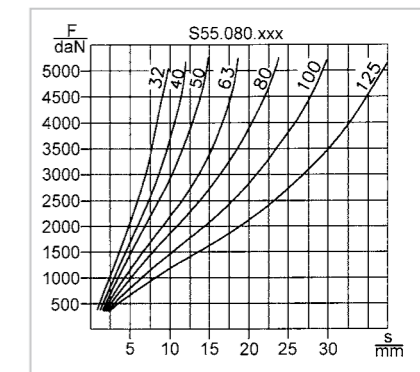
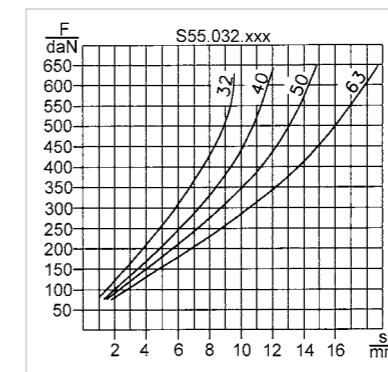
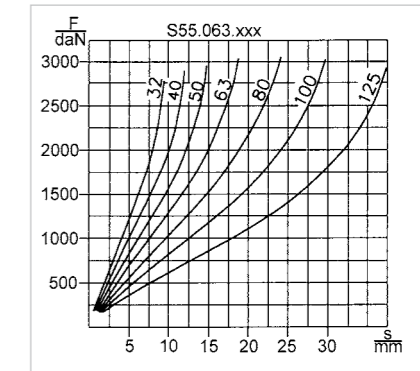
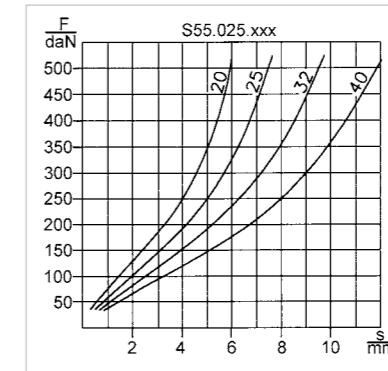
Ordering example
 Spring \varnothing D1=16 L_0 =12

Please state
 S55.016.012



D1	d	D2 fmax	Lo	Reference
16	6,5	20	12	S55.016.012
16	6,5	20	16	S55.016.016
16	6,5	20	20	S55.016.020
16	6,5	20	25	S55.016.025
20	8,5	25	16	S55.020.016
20	8,5	25	20	S55.020.020
20	8,5	25	25	S55.020.025
20	8,5	25	32	S55.020.032
25	10,5	30	20	S55.025.020
25	10,5	30	25	S55.025.025
25	10,5	30	32	S55.025.032
25	10,5	30	40	S55.025.040
32	13,5	39	32	S55.032.032
32	13,5	39	40	S55.032.040
32	13,5	39	50	S55.032.050
32	13,5	39	63	S55.032.063
40	13,5	48	32	S55.040.032
40	13,5	48	40	S55.040.040
40	13,5	48	50	S55.040.050
40	13,5	48	63	S55.040.063
40	13,5	48	80	S55.040.080
50	17	60	32	S55.050.032
50	17	60	40	S55.050.040
50	17	60	50	S55.050.050
50	17	60	63	S55.050.063
50	17	60	80	S55.050.080
50	17	60	100	S55.050.100

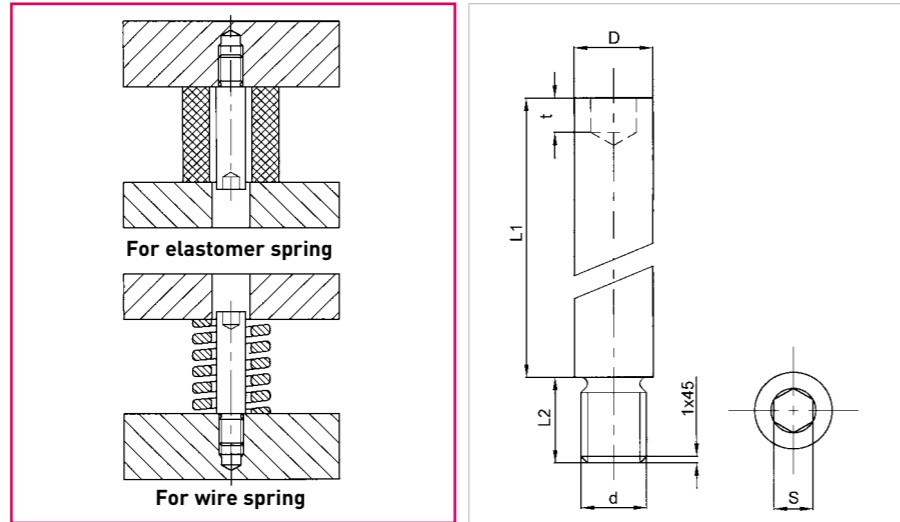
D1	d	D2 fmax	Lo	Reference
63	17	76	32	S55.063.032
63	17	76	40	S55.063.040
63	17	76	50	S55.063.050
63	17	76	63	S55.063.063
63	17	76	80	S55.063.080
63	17	76	100	S55.063.100
63	17	76	125	S55.063.125
80	21	96	32	S55.080.032
80	21	96	40	S55.080.040
80	21	96	50	S55.080.050
80	21	96	63	S55.080.063
80	21	96	80	S55.080.080
80	21	96	100	S55.080.100
80	21	96	125	S55.080.125
100	21	120	32	S55.100.032
100	21	120	40	S55.100.040
100	21	120	50	S55.100.050
100	21	120	63	S55.100.063
100	21	120	80	S55.100.080
100	21	120	100	S55.100.100
100	21	120	125	S55.100.125
125	27	150	32	S55.125.032
125	27	150	40	S55.125.040
125	27	150	50	S55.125.050
125	27	150	63	S55.125.063
125	27	150	80	S55.125.080
125	27	150	100	S55.125.100
125	27	150	125	S55.125.125
125	27	150	160	S55.125.160



Guide shafts conform to
DIN 9835 standard
Tolerance D: h11

Ordering example
Ø 6 mm guide shaft
Length: 20 mm

Please state : S60.006.020



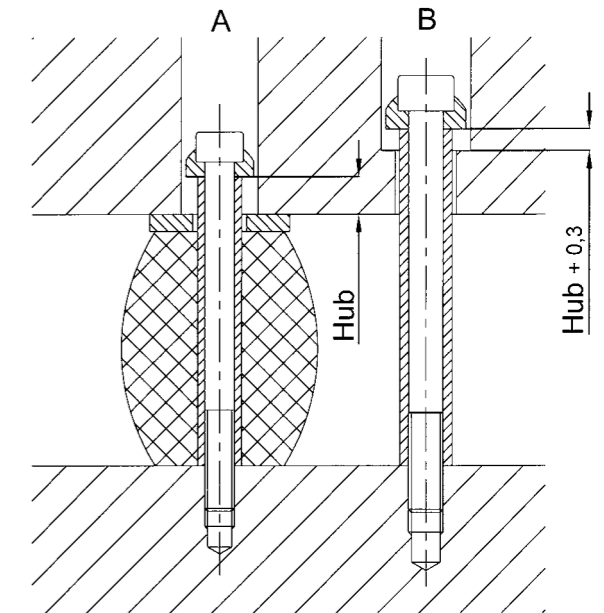
D	6	8	10	13	16	20	25
d	M4	M6	M8	M10	M12	M16	M20
L2	6	9	15	15	18	25	30
s	3	4	5	6	8	10	14
t	2,5	3	4	5	6	8	10
L1	20	S60.006.020	S60.008.020	S60.010.020			
	25	S60.006.025	S60.008.025	S60.010.025			
	32	S60.006.032	S60.008.032	S60.010.032	S60.013.032	S60.016.032	S60.020.032
	40		S60.008.040	S60.010.040	S60.013.040	S60.016.040	S60.020.040
	50		S60.008.050	S60.010.050	S60.013.050	S60.016.050	S60.020.050
	63			S60.010.063	S60.013.063	S60.016.063	S60.020.063
	80				S60.013.080	S60.016.080	S60.020.080
	95				S60.013.095	S60.016.095	S60.020.095
	118					S60.016.118	S60.020.118
	140					S60.016.140	S60.020.140
180							S60.025.180

Preloaded springs offer key benefits

Each spring is individually attached and pre-loaded to the desired length. When assembling the tool, there is no need to compress all of the springs. In the resting position, the springs are not preloaded by the retainer. This saves time and improves safety during assembly and maintenance operations.

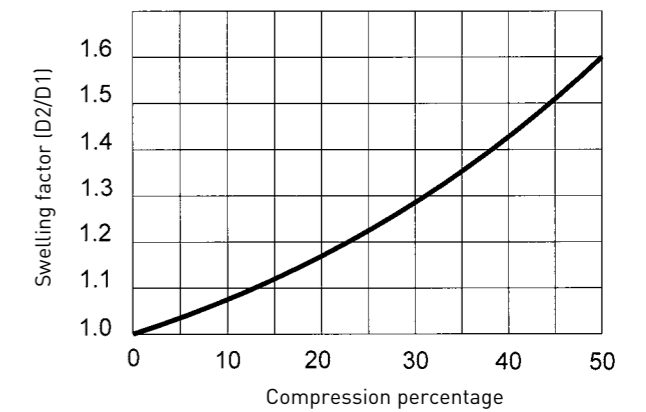
Assembly examples

- A Preloaded spring with S65.xxx.xxx washer and A15.xxx.xxx locking grub screw
- B Restriction of travel via one A15.xxx.xxx locking grub screw



Footprint

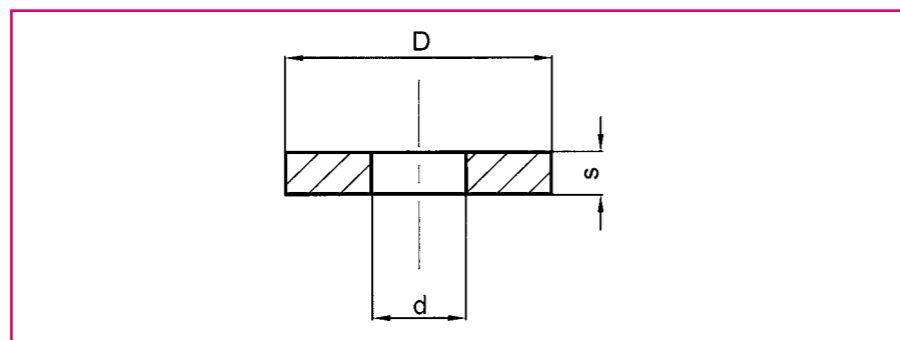
Elastomer springs are incompressible. Their deformation under load causes them to swell. This means that the swelling percentage is equal to the compression percentage. Therefore, it is essential to monitor the swelling curve in order to determine and define the locations and safety zones.



Conform to: DIN 9835

Ordering example
Ø20 washer

Please state: S65.010.020



D	20	25	30	40	50	60	80	100	120	150
d	6,5	8,5	10,5	13,5	13,5	16,5	16,5	20,5	20,5	26
9	4	4	5	5	5	6	6	8	8	8
Reference	S65.010.020	S65.010.025	S65.010.030	S65.010.040	S65.010.050	S65.010.060	S65.010.080	S65.010.100	S65.010.120	S65.010.150

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