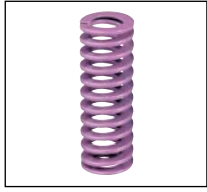


Spring elements

- System springs, system spring units
- Nitrogen cylinders
- Helical springs with round, square and oval wire cross section
- Disc springs
- Rubber and elastomer springs
- Cushioned thrust pieces
- Polyurethane plates and rods





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SZ 8010 Page 5.16



SZ 8020 Page 5.18



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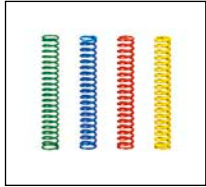
SZ 8045 Page 5.24



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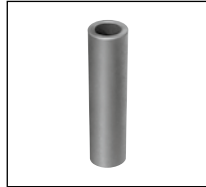
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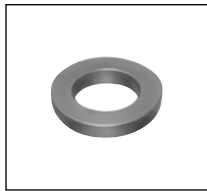
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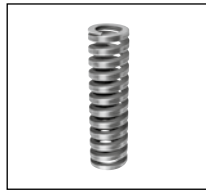
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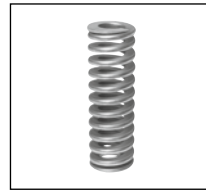
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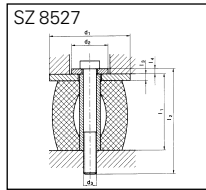
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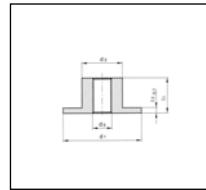
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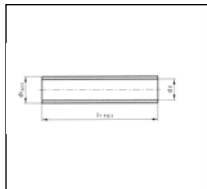
SZ 8526 Page 5.45



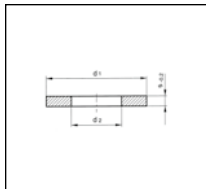
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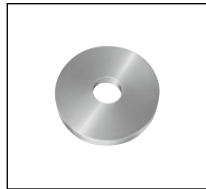
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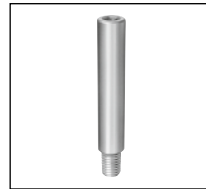
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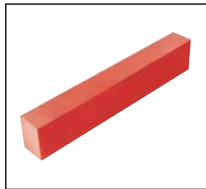
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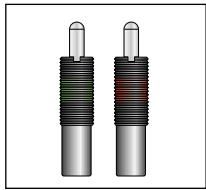
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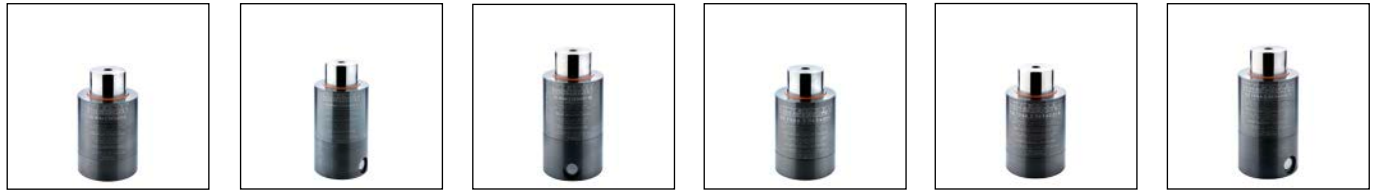
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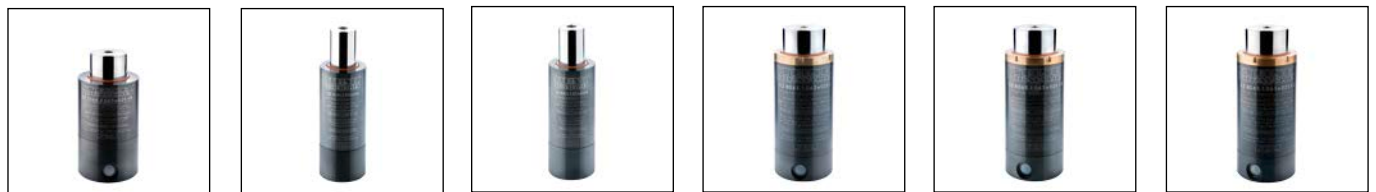
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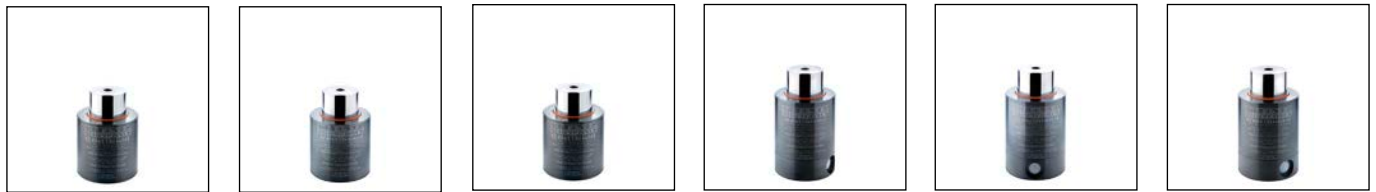
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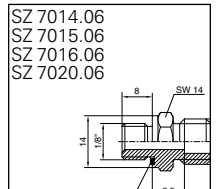
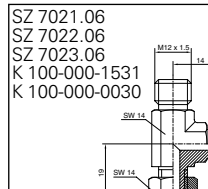
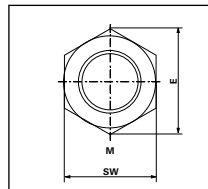
SZ 7066.2.VB Page 5.104 **SZ 8065.2** Page 5.106 **SZ 8065.2.B** Page 5.108 **SZ 8065.2.V** Page 5.110 **SZ 8065.2.VB** Page 5.112 **SZ 8065.2.VZ** Page 5.114



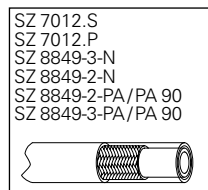
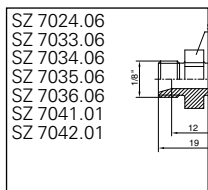
SZ 8063.1 Page 5.116 **SZ 8063.1.B** Page 5.120 **SZ 8063.1.PD** Page 5.122 **SZ 8063.1.V** Page 5.124 **SZ 8063.1.VB** Page 5.126 **SZ 8063.1.VZ** Page 5.128



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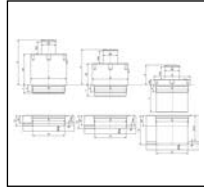
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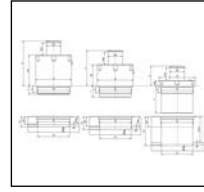
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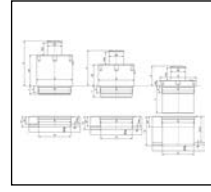
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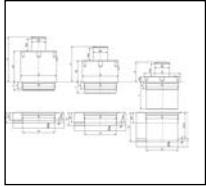
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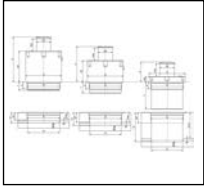
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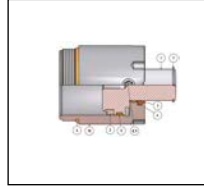
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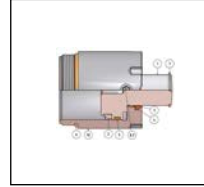
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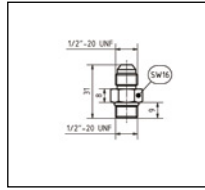
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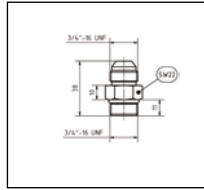
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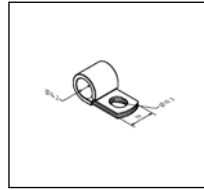
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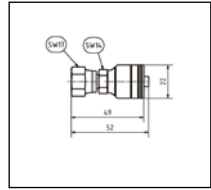
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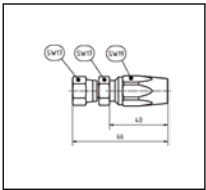
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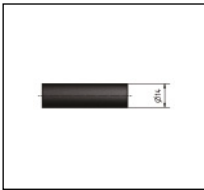
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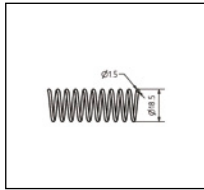
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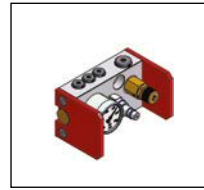
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ST 8849-x-SS Page 5.183



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Helical compression springs in 8 types of load:

The system springs made from profiled valve spring steel wire are available in 8 types of load. These helical compression springs have the same installation dimensions so that an increase or reduction of the required compressive force can take place without a problem, even at a later date.

The system springs have different colours for immediate distinction, and can thus be quickly allocated to the respective type of load.

Ascending order numbers also mean ascending types of load of the system springs, so that it is only necessary to add the sleeve diameter (D_h) x of the unloaded spring length (L_0).

Order number	Type of load	Identification colour
SZ 8005. $D_h \times L_0$	Extra light load	Lilac
SZ 8010. $D_h \times L_0$	Light load	Green
SZ 8020. $D_h \times L_0$	Medium load	Blue
SZ 8030. $D_h \times L_0$	Heavy load	Red
SZ 8040. $D_h \times L_0$	Very heavy load	Yellow
SZ 8045. $D_h \times L_0$	Extra heavy load	Bronze
SZ 8047. $D_h \times L_0$	Extra, extra heavy load	Black
SZ 8049. $D_h \times L_0$	Extra, extra heavy load	Double black

Installation dimensions – basic dimensions:

The STEINEL system springs are available in nine basic dimensions for the following sleeve diameters (D_h)/pin diameters (D_d).

D_h/D_d	D_h/D_d	D_h/D_d
10/5	20/10	40/20
12.5/6.3	25/12.5	50/25
16/8	32/16	63/38

The installation lengths of the unloaded springs (L_0) are based on inch sizes corresponding to 25 to 254 mm.

Material:

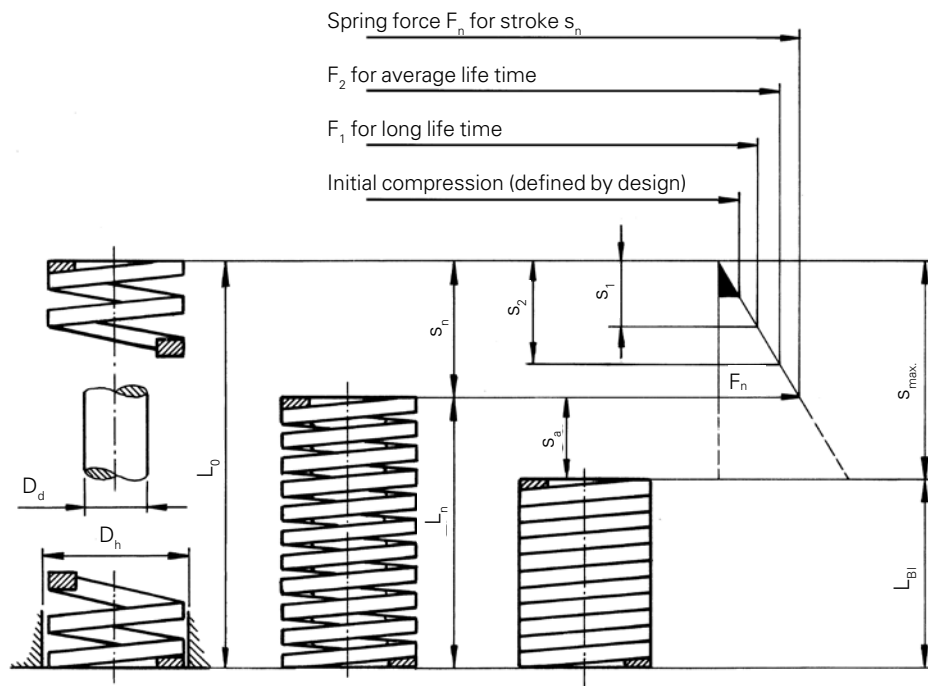
All springs are made from alloyed valve spring steel wire (CrV/CRSi). This wire is particularly resistant to impact and vibration strains. In addition, this quality can also be used for higher operating temperatures of up to 180 °C/ 356 °F. Versions SZ 8047 and SZ 8049 up to 125 °C/257 °F.

Manufacturing and testing procedures:

All springs are subjected to special thermal treatments, shot-blasted and set. This eliminates tension in order to achieve high durability.

The spring ends are closed and rectangular ground.

The springs are subjected to strict quality control, with additional life time testing being carried out in the form of vibration tests.



Explanations of the dimension letters:

- c = Spring rate in N/mm (spring force per mm stroke)
- D_d = Pin diameter (inner guide) in mm
- D_h = Sleeve diameter (outer guide) in mm
- F_1 to F_n = Spring force in N assigned to the stroke s_1 to s_n
- L_0 = Length of the unloaded springs in mm
- L_n = Smallest permissible length of loaded springs
- s_1 to s_n = Strokes in mm assigned to the spring forces F_1 to F_n
- L_n = Smallest permissible test length $L_{Bl} + s_a$
- L_{Bl} = Block length of spring (all windings are adjacent to one another)
- s_{max} = Maximum theoretical stroke mm
- s_a = Sum of the minimum distances between the individual cushioned windings

Tolerances for the length of the unloaded springs, L_0

The tolerance of L_0 is $\pm 1\%$, min. ± 0.75 mm.

For SZ 8047 and SZ 8049, L_0 is $\pm 0.5\%$, min. ± 0.2 mm.

Design-related selection guidelines:

- The stroke is the priority
- The spring force is the priority
- The life time is the priority

Note:

The stroke s_n (max. working length) and the resulting spring force F_n listed in the tables must not be exceeded.

Every spring should always be pre-loaded, since natural vibration and impact-shock strain on an unloaded spring reduce its life time.

Each spring must be guided by an outer guide (D_h) and/or an inner guide (D_d). A rule of thumb is: The depression depth or rod length should be at least two to three windings of the spring. The longer the spring, the longer the guide.

In terms of design, a long spring life time should always be aimed for. For this reason, the spring should preferably be designed according to stroke s_1 and the resulting spring force F_1 . For short springs, the length tolerance should be taken into consideration or removed from the stroke.

Stroke designations:

- s_1 = Long life time
- s_2 = Medium life time

System springs

quick overview



Helical compression springs

Material:

Profiled valve spring steel wire (52SiCrNi5)

The springs are set, installed and rectangular ground.

The most important characteristics:

- c = Spring rate in N/mm
(spring force per mm stroke)
- D_h = Sleeve diameter in mm
- L₀ = Length of the unloaded spring in mm

Sleeves Ø D _h ^{H15}	Pin Ø D _{dh15}	Unloaded Length L ₀	Lilac extra light load c	Order number	Green light load c	Order number	Blue medium load c	Order number	Red heavy load c	Order number
10	5	25	8.5	SZ 8005.10 x 025	10.0	SZ 8010.10 x 025	16.0	SZ 8020.10 x 025	22.1	SZ 8030.10 x 025
		32	6.5	SZ 8005.10 x 032	8.5	SZ 8010.10 x 032	13.0	SZ 8020.10 x 032	17.5	SZ 8030.10 x 032
		38	5.5	SZ 8005.10 x 038	6.8	SZ 8010.10 x 038	11.9	SZ 8020.10 x 038	17.1	SZ 8030.10 x 038
		44	5.0	SZ 8005.10 x 044	6.0	SZ 8010.10 x 044	10.3	SZ 8020.10 x 044	15.0	SZ 8030.10 x 044
		51	4.5	SZ 8005.10 x 051	5.0	SZ 8010.10 x 051	8.9	SZ 8020.10 x 051	12.8	SZ 8030.10 x 051
		64	3.3	SZ 8005.10 x 064	4.3	SZ 8010.10 x 064	7.5	SZ 8020.10 x 064	10.7	SZ 8030.10 x 064
		76	3.2	SZ 8005.10 x 076	3.2	SZ 8010.10 x 076	5.3	SZ 8020.10 x 076	7.5	SZ 8030.10 x 076
		305	0.6	SZ 8005.10 x 305	1.1	SZ 8010.10 x 305	1.6	SZ 8020.10 x 305	2.1	SZ 8030.10 x 305
12.5	6.3	25	15.5	SZ 8005.13 x 025	17.9	SZ 8010.13 x 025	30.0	SZ 8020.13 x 025	42.1	SZ 8030.13 x 025
		32	12.2	SZ 8005.13 x 032	16.4	SZ 8010.13 x 032	24.8	SZ 8020.13 x 032	33.2	SZ 8030.13 x 032
		38	10.3	SZ 8005.13 x 038	13.6	SZ 8010.13 x 038	21.4	SZ 8020.13 x 038	29.3	SZ 8030.13 x 038
		44	8.7	SZ 8005.13 x 044	12.1	SZ 8010.13 x 044	18.5	SZ 8020.13 x 044	24.6	SZ 8030.13 x 044
		51	7.5	SZ 8005.13 x 051	11.4	SZ 8010.13 x 051	15.5	SZ 8020.13 x 051	19.6	SZ 8030.13 x 051
		64	5.8	SZ 8005.13 x 064	9.3	SZ 8010.13 x 064	12.1	SZ 8020.13 x 064	15.0	SZ 8030.13 x 064
		76	4.7	SZ 8005.13 x 076	7.1	SZ 8010.13 x 076	10.2	SZ 8020.13 x 076	13.2	SZ 8030.13 x 076
		305	1.2	SZ 8005.13 x 305	1.4	SZ 8010.13 x 305	2.1	SZ 8020.13 x 305	2.8	SZ 8030.13 x 305
16	8	25	20.2	SZ 8005.16 x 025	23.4	SZ 8010.16 x 025	49.4	SZ 8020.16 x 025	75.7	SZ 8030.16 x 025
		32	14.4	SZ 8005.16 x 032	22.9	SZ 8010.16 x 032	37.1	SZ 8020.16 x 032	52.8	SZ 8030.16 x 032
		38	12.3	SZ 8005.16 x 038	19.3	SZ 8010.16 x 038	33.9	SZ 8020.16 x 038	48.5	SZ 8030.16 x 038
		44	10.6	SZ 8005.16 x 044	17.1	SZ 8010.16 x 044	30.0	SZ 8020.16 x 044	42.8	SZ 8030.16 x 044
		51	8.9	SZ 8005.16 x 051	15.7	SZ 8010.16 x 051	26.4	SZ 8020.16 x 051	37.1	SZ 8030.16 x 051
		64	7.0	SZ 8005.16 x 064	10.7	SZ 8010.16 x 064	20.5	SZ 8020.16 x 064	30.3	SZ 8030.16 x 064
		76	5.8	SZ 8005.16 x 076	10.0	SZ 8010.16 x 076	17.8	SZ 8020.16 x 076	25.8	SZ 8030.16 x 076
		305	1.5	SZ 8005.16 x 305	2.5	SZ 8010.16 x 305	4.8	SZ 8020.16 x 305	7.1	SZ 8030.16 x 305
20	10	25	32.1	SZ 8005.20 x 025	55.8	SZ 8010.20 x 025	98.0	SZ 8020.20 x 025	216.0	SZ 8030.20 x 025
		32	24.7	SZ 8005.20 x 032	45.0	SZ 8010.20 x 032	72.6	SZ 8020.20 x 032	168.0	SZ 8030.20 x 032
		38	20.7	SZ 8005.20 x 038	33.3	SZ 8010.20 x 038	56.0	SZ 8020.20 x 038	129.0	SZ 8030.20 x 038
		44	17.8	SZ 8005.20 x 044	30.0	SZ 8010.20 x 044	47.5	SZ 8020.20 x 044	112.0	SZ 8030.20 x 044
		51	15.3	SZ 8005.20 x 051	24.5	SZ 8010.20 x 051	41.7	SZ 8020.20 x 051	94.0	SZ 8030.20 x 051
		64	12.1	SZ 8005.20 x 064	20.0	SZ 8010.20 x 064	32.3	SZ 8020.20 x 064	72.1	SZ 8030.20 x 064
		76	10.2	SZ 8005.20 x 076	16.0	SZ 8010.20 x 076	25.1	SZ 8020.20 x 076	59.7	SZ 8030.20 x 076
		89	8.6	SZ 8005.20 x 089	14.0	SZ 8010.20 x 089	22.0	SZ 8020.20 x 089	50.5	SZ 8030.20 x 089
		102	7.5	SZ 8005.20 x 102	12.0	SZ 8010.20 x 102	19.8	SZ 8020.20 x 102	44.2	SZ 8030.20 x 102
		115	6.7	SZ 8005.20 x 115	10.9	SZ 8010.20 x 115	18.1	SZ 8020.20 x 115	38.4	SZ 8030.20 x 115
		127	6.1	SZ 8005.20 x 127	9.5	SZ 8010.20 x 127	16.6	SZ 8020.20 x 127	34.1	SZ 8030.20 x 127
		139	5.5	SZ 8005.20 x 139	8.4	SZ 8010.20 x 139	15.1	SZ 8020.20 x 139	31.0	SZ 8030.20 x 139
		152	5.1	SZ 8005.20 x 152	7.5	SZ 8010.20 x 152	13.2	SZ 8020.20 x 152	28.2	SZ 8030.20 x 152
305	2.5	SZ 8005.20 x 305	4.0	SZ 8010.20 x 305	6.1	SZ 8020.20 x 305	15.0	SZ 8030.20 x 305		

Sleeves Ø D _h ^{H15}	Pin Ø D _{dh15}	Unloaded Lilac			Green		Blue		Red		
		Length L ₀	extra light load c	Order number	light load c	Order number	medium load c	Order number	heavy load c	Order number	
25	12.5	25	52.7	SZ 8005.25 x 025	100.0	SZ 8010.25 x 025	147.0	SZ 8020.25 x 025	375.0	SZ 8030.25 x 025	
		32	40.0	SZ 8005.25 x 032	80.3	SZ 8010.25 x 032	118.0	SZ 8020.25 x 032	297.0	SZ 8030.25 x 032	
		38	33.3	SZ 8005.25 x 038	62.0	SZ 8010.25 x 038	93.0	SZ 8020.25 x 038	219.0	SZ 8030.25 x 038	
		44	28.6	SZ 8005.25 x 044	52.9	SZ 8010.25 x 044	80.0	SZ 8020.25 x 044	187.0	SZ 8030.25 x 044	
		51	24.7	SZ 8005.25 x 051	44.0	SZ 8010.25 x 051	68.6	SZ 8020.25 x 051	156.0	SZ 8030.25 x 051	
		64	19.4	SZ 8005.25 x 064	35.2	SZ 8010.25 x 064	53.0	SZ 8020.25 x 064	123.0	SZ 8030.25 x 064	
		76	16.3	SZ 8005.25 x 076	28.0	SZ 8010.25 x 076	43.2	SZ 8020.25 x 076	99.0	SZ 8030.25 x 076	
		89	13.9	SZ 8005.25 x 089	24.0	SZ 8010.25 x 089	38.2	SZ 8020.25 x 089	84.0	SZ 8030.25 x 089	
		102	12.1	SZ 8005.25 x 102	21.1	SZ 8010.25 x 102	33.0	SZ 8020.25 x 102	73.0	SZ 8030.25 x 102	
		115	10.8	SZ 8005.25 x 115	18.7	SZ 8010.25 x 115	28.0	SZ 8020.25 x 115	65.0	SZ 8030.25 x 115	
		127	9.8	SZ 8005.25 x 127	16.7	SZ 8010.25 x 127	25.9	SZ 8020.25 x 127	57.7	SZ 8030.25 x 127	
		139	8.9	SZ 8005.25 x 139	15.3	SZ 8010.25 x 139	23.2	SZ 8020.25 x 139	52.7	SZ 8030.25 x 139	
		152	8.1	SZ 8005.25 x 152	14.0	SZ 8010.25 x 152	20.8	SZ 8020.25 x 152	47.8	SZ 8030.25 x 152	
		178	6.9	SZ 8005.25 x 178	12.5	SZ 8010.25 x 178	17.8	SZ 8020.25 x 178	41.0	SZ 8030.25 x 178	
		203	6.1	SZ 8005.25 x 203	10.4	SZ 8010.25 x 203	15.8	SZ 8020.25 x 203	35.8	SZ 8030.25 x 203	
305	4.0	SZ 8005.25 x 305	7.0	SZ 8010.25 x 305	10.2	SZ 8020.25 x 305	22.9	SZ 8030.25 x 305			
32	16	38	43.8	SZ 8005.32 x 038	94.0	SZ 8010.32 x 038	185.0	SZ 8020.32 x 038	388.0	SZ 8030.32 x 038	
		44	37.5	SZ 8005.32 x 044	79.5	SZ 8010.32 x 044	158.0	SZ 8020.32 x 044	324.0	SZ 8030.32 x 044	
		51	32.3	SZ 8005.32 x 051	67.0	SZ 8010.32 x 051	134.0	SZ 8020.32 x 051	272.0	SZ 8030.32 x 051	
		64	25.4	SZ 8005.32 x 064	53.0	SZ 8010.32 x 064	99.0	SZ 8020.32 x 064	212.0	SZ 8030.32 x 064	
		76	21.3	SZ 8005.32 x 076	44.0	SZ 8010.32 x 076	80.5	SZ 8020.32 x 076	172.0	SZ 8030.32 x 076	
		89	18.1	SZ 8005.32 x 089	37.2	SZ 8010.32 x 089	69.1	SZ 8020.32 x 089	141.0	SZ 8030.32 x 089	
		102	15.8	SZ 8005.32 x 102	32.0	SZ 8010.32 x 102	58.8	SZ 8020.32 x 102	122.0	SZ 8030.32 x 102	
		115	13.9	SZ 8005.32 x 115	29.0	SZ 8010.32 x 115	51.5	SZ 8020.32 x 115	107.0	SZ 8030.32 x 115	
		127	12.6	SZ 8005.32 x 127	25.0	SZ 8010.32 x 127	44.8	SZ 8020.32 x 127	93.0	SZ 8030.32 x 127	
		139	11.4	SZ 8005.32 x 139	23.0	SZ 8010.32 x 139	42.3	SZ 8020.32 x 139	86.0	SZ 8030.32 x 139	
		152	10.5	SZ 8005.32 x 152	21.5	SZ 8010.32 x 152	37.8	SZ 8020.32 x 152	78.0	SZ 8030.32 x 152	
		178	8.9	SZ 8005.32 x 178	18.2	SZ 8010.32 x 178	32.5	SZ 8020.32 x 178	67.2	SZ 8030.32 x 178	
		203	7.8	SZ 8005.32 x 203	15.8	SZ 8010.32 x 203	28.9	SZ 8020.32 x 203	59.1	SZ 8030.32 x 203	
		254	6.2	SZ 8005.32 x 254	12.5	SZ 8010.32 x 254	21.4	SZ 8020.32 x 254	46.4	SZ 8030.32 x 254	
		305	5.2	SZ 8005.32 x 305	10.3	SZ 8010.32 x 305	18.3	SZ 8020.32 x 305	38.0	SZ 8030.32 x 305	
40	20	51	50.8	SZ 8005.40 x 051	92.0	SZ 8010.40 x 051	181.6	SZ 8020.40 x 051	350.0	SZ 8030.40 x 051	
		64	39.7	SZ 8005.40 x 064	73.0	SZ 8010.40 x 064	140.4	SZ 8020.40 x 064	269.0	SZ 8030.40 x 064	
		76	33.1	SZ 8005.40 x 076	63.0	SZ 8010.40 x 076	108.0	SZ 8020.40 x 076	219.0	SZ 8030.40 x 076	
		89	28.1	SZ 8005.40 x 089	51.0	SZ 8010.40 x 089	90.7	SZ 8020.40 x 089	190.0	SZ 8030.40 x 089	
		102	24.5	SZ 8005.40 x 102	43.0	SZ 8010.40 x 102	81.0	SZ 8020.40 x 102	163.0	SZ 8030.40 x 102	
		115	21.6	SZ 8005.40 x 115	39.6	SZ 8010.40 x 115	71.8	SZ 8020.40 x 115	142.0	SZ 8030.40 x 115	
		127	19.5	SZ 8005.40 x 127	37.0	SZ 8010.40 x 127	62.7	SZ 8020.40 x 127	128.0	SZ 8030.40 x 127	
		139	17.8	SZ 8005.40 x 139	32.0	SZ 8010.40 x 139	57.5	SZ 8020.40 x 139	115.0	SZ 8030.40 x 139	
		152	16.3	SZ 8005.40 x 152	28.0	SZ 8010.40 x 152	51.6	SZ 8020.40 x 152	105.0	SZ 8030.40 x 152	
		160	-	-	-	-	47.5	SZ 8020.40 x 160	-	-	
		178	13.8	SZ 8005.40 x 178	25.2	SZ 8010.40 x 178	44.1	SZ 8020.40 x 178	89.0	SZ 8030.40 x 178	
		203	12.1	SZ 8005.40 x 203	22.7	SZ 8010.40 x 203	36.7	SZ 8020.40 x 203	77.0	SZ 8030.40 x 203	
		254	9.7	SZ 8005.40 x 254	17.0	SZ 8010.40 x 254	30.1	SZ 8020.40 x 254	61.0	SZ 8030.40 x 254	
		305	8.0	SZ 8005.40 x 305	14.8	SZ 8010.40 x 305	24.6	SZ 8020.40 x 305	51.0	SZ 8030.40 x 305	
		50	25	64	80.2	SZ 8005.50 x 064	156.0	SZ 8010.50 x 064	209.0	SZ 8020.50 x 064	413.0
76	66.9			SZ 8005.50 x 076	125.0	SZ 8010.50 x 076	168.0	SZ 8020.50 x 076	339.0	SZ 8030.50 x 076	
89	56.6			SZ 8005.50 x 089	109.0	SZ 8010.50 x 089	140.4	SZ 8020.50 x 089	288.0	SZ 8030.50 x 089	
102	49.3			SZ 8005.50 x 102	94.0	SZ 8010.50 x 102	119.0	SZ 8020.50 x 102	245.0	SZ 8030.50 x 102	
115	43.5			SZ 8005.50 x 115	81.0	SZ 8010.50 x 115	106.0	SZ 8020.50 x 115	215.0	SZ 8030.50 x 115	
127	39.3			SZ 8005.50 x 127	71.0	SZ 8010.50 x 127	97.0	SZ 8020.50 x 127	192.0	SZ 8030.50 x 127	
139	35.8			SZ 8005.50 x 139	66.5	SZ 8010.50 x 139	87.0	SZ 8020.50 x 139	168.0	SZ 8030.50 x 139	
152	32.8			SZ 8005.50 x 152	60.0	SZ 8010.50 x 152	80.0	SZ 8020.50 x 152	154.0	SZ 8030.50 x 152	
160	-			-	-	-	76.0	SZ 8020.50 x 160	-	-	
178	27.8			SZ 8005.50 x 178	52.0	SZ 8010.50 x 178	69.5	SZ 8020.50 x 178	134.0	SZ 8030.50 x 178	
203	24.2			SZ 8005.50 x 203	44.0	SZ 8010.50 x 203	59.8	SZ 8020.50 x 203	117.0	SZ 8030.50 x 203	
229	-			-	-	-	38.2	SZ 8010.50 x 229	50.9	SZ 8020.50 x 229	-
254	19.2			SZ 8005.50 x 254	35.0	SZ 8010.50 x 254	43.9	SZ 8020.50 x 254	89.0	SZ 8030.50 x 254	
305	16.0			SZ 8005.50 x 305	28.5	SZ 8010.50 x 305	38.6	SZ 8020.50 x 305	73.0	SZ 8030.50 x 305	
63	38			76	57.8	SZ 8005.63 x 076	189.0	SZ 8010.63 x 076	312.0	SZ 8020.63 x 076	630.0
		89	51.4	SZ 8005.63 x 089	158.0	SZ 8010.63 x 089	260.0	SZ 8020.63 x 089	485.0	SZ 8030.63 x 089	
		102	44.4	SZ 8005.63 x 102	131.0	SZ 8010.63 x 102	221.0	SZ 8020.63 x 102	434.0	SZ 8030.63 x 102	
		115	41.6	SZ 8005.63 x 115	116.0	SZ 8010.63 x 115	187.0	SZ 8020.63 x 115	384.0	SZ 8030.63 x 115	
		127	33.2	SZ 8005.63 x 127	103.0	SZ 8010.63 x 127	168.0	SZ 8020.63 x 127	349.0	SZ 8030.63 x 127	
		152	27.4	SZ 8005.63 x 152	84.3	SZ 8010.63 x 152	136.0	SZ 8020.63 x 152	276.0	SZ 8030.63 x 152	
		160	-	-	-	-	128.0	SZ 8020.63 x 160	-	-	
		178	24.0	SZ 8005.63 x 178	71.5	SZ 8010.63 x 178	114.0	SZ 8020.63 x 178	237.0	SZ 8030.63 x 178	
		203	21.0	SZ 8005.63 x 203	61.7	SZ 8010.63 x 203	100.0	SZ 8020.63 x 203	210.0	SZ 8030.63 x 203	
		229	-	-	-	-	89.2	SZ 8020.63 x 229	-	-	
		254	16.4	SZ 8005.63 x 254	47.0	SZ 8010.63 x 254	78.4	SZ 8020.63 x 254	165.0	SZ 8030.63 x 254	
		305	13.6	SZ 8005.63 x 305	38.2	SZ 8010.63 x 305	64.7	SZ 8020.63 x 305	134.0	SZ 8030.63 x 305	
		315	-	-	-	-	62.8	SZ 8020.63 x 315	-	-	
		400	-	-	-	-	48.5	SZ 8020.63 x 400	-	-	

System springs

quick overview



Helical compression springs

Material:

Profiled valve spring steel wire (52SiCrNi5)

The springs are set, installed and rectangular ground.

The most important characteristics:

- c = Spring rate in N/mm (spring force per mm stroke)
- D_h = Sleeve diameter in mm
- L₀ = Length of the unloaded spring in mm

Sleeves Ø	Pin Ø	Unloaded Length	Yellow particularly heavy load		Bronze extra heavy load		Unloaded Length	Black extra, extra heavy load		Black double extra, extra heavy load	
D _h ^{H15}	D _{dh15}	L ₀	c	Order number	c	Order number	L ₀	c	Order number	c	Order number
10	5	25	36.8	SZ 8040.10 x 025	167.0	SZ 8045.10 x 025	20	580.0	SZ 8047.10 x 020	-	-
		32	27.9	SZ 8040.10 x 032	130.0	SZ 8045.10 x 032	30	360.0	SZ 8047.10 x 030	-	-
		38	23.7	SZ 8040.10 x 038	105.0	SZ 8045.10 x 038	40	260.0	SZ 8047.10 x 040	-	-
		44	19.2	SZ 8040.10 x 044	86.0	SZ 8045.10 x 044	50	200.0	SZ 8047.10 x 050	-	-
		51	16.5	SZ 8040.10 x 051	79.0	SZ 8045.10 x 051	-	-	-	-	-
		64	13.2	SZ 8040.10 x 064	62.0	SZ 8045.10 x 064	-	-	-	-	-
		76	10.9	SZ 8040.10 x 076	51.0	SZ 8045.10 x 076	-	-	-	-	-
		305	2.6	SZ 8040.10 x 305	-	-	-	-	-	-	-
12.5	6.3	25	58.5	SZ 8040.13 x 025	288.0	SZ 8045.13 x 025	20	850.0	SZ 8047.13 x 020	-	-
		32	43.9	SZ 8040.13 x 032	216.0	SZ 8045.13 x 032	30	590.0	SZ 8047.13 x 030	-	-
		38	36.0	SZ 8040.13 x 038	176.0	SZ 8045.13 x 038	40	400.0	SZ 8047.13 x 040	-	-
		44	30.3	SZ 8040.13 x 044	149.0	SZ 8045.13 x 044	50	320.0	SZ 8047.13 x 050	-	-
		51	26.2	SZ 8040.13 x 051	128.0	SZ 8045.13 x 051	-	-	-	-	-
		64	21.2	SZ 8040.13 x 064	100.0	SZ 8045.13 x 064	-	-	-	-	-
		76	17.1	SZ 8040.13 x 076	84.0	SZ 8045.13 x 076	-	-	-	-	-
		89	14.5	SZ 8040.13 x 089	71.0	SZ 8045.13 x 089	-	-	-	-	-
		102	12.5	SZ 8040.13 x 102	61.0	SZ 8045.13 x 102	-	-	-	-	-
16	8	25	118.0	SZ 8040.16 x 025	-	-	20	1650.0	SZ 8047.16 x 020	-	-
		32	89.0	SZ 8040.16 x 032	449.0	SZ 8045.16 x 032	35	920.0	SZ 8047.16 x 035	-	-
		38	72.1	SZ 8040.16 x 038	363.0	SZ 8045.16 x 038	50	580.0	SZ 8047.16 x 050	-	-
		44	60.9	SZ 8040.16 x 044	309.0	SZ 8045.16 x 044	75	410.0	SZ 8047.16 x 075	-	-
		51	52.3	SZ 8040.16 x 051	256.0	SZ 8045.16 x 051	100	280.0	SZ 8047.16 x 100	-	-
		64	41.2	SZ 8040.16 x 064	203.0	SZ 8045.16 x 064	-	-	-	-	-
		76	34.1	SZ 8040.16 x 076	166.0	SZ 8045.16 x 076	-	-	-	-	-
		89	29.5	SZ 8040.16 x 089	139.0	SZ 8045.16 x 089	-	-	-	-	-
		102	25.6	SZ 8040.16 x 102	114.0	SZ 8045.16 x 102	-	-	-	-	-
		115	22.8	SZ 8040.16 x 115	105.0	SZ 8045.16 x 105	-	-	-	-	-
		127	-	-	94.0	SZ 8045.16 x 127	-	-	-	-	-
		152	-	-	69.0	SZ 8045.16 x 152	-	-	-	-	-
		305	8.4	SZ 8040.16 x 305	37.0	SZ 8045.16 x 305	-	-	-	-	-
19	10	-	-	-	-	-	25	2270.0	SZ 8047.20 x 025	-	-
		-	-	-	-	-	40	1160.0	SZ 8047.20 x 040	-	-
		-	-	-	-	-	50	830.0	SZ 8047.20 x 050	-	-
		-	-	-	-	-	75	500.0	SZ 8047.20 x 075	-	-
		-	-	-	-	-	100	360.0	SZ 8047.20 x 100	-	-

Sleeves	Pin	Unloaded	Yellow		Bronze		Unloaded	Black		Black double	
Ø	Ø	Length	particularly heavy load		extra heavy load		Length	extra, extra heavy load		extra, extra heavy load	
D _h ^{H15}	D _{dh15}	L ₀	c	Order number	c	Order number	L ₀	c	Order number	c	Order number
20	10	25	293.0	SZ 8040.20 x 025	-	-	-	-	-	-	-
		32	224.0	SZ 8040.20 x 032	-	-	-	-	-	-	-
		38	177.0	SZ 8040.20 x 038	-	-	-	-	-	-	-
		44	149.0	SZ 8040.20 x 044	452.0	SZ 8045.20 x 044	-	-	-	-	-
		51	128.0	SZ 8040.20 x 051	378.0	SZ 8045.20 x 051	-	-	-	-	-
		64	99.0	SZ 8040.20 x 064	301.0	SZ 8045.20 x 064	-	-	-	-	-
		76	81.7	SZ 8040.20 x 076	247.0	SZ 8045.20 x 076	-	-	-	-	-
		89	69.5	SZ 8040.20 x 089	208.0	SZ 8045.20 x 089	-	-	-	-	-
		102	60.6	SZ 8040.20 x 102	188.0	SZ 8045.20 x 102	-	-	-	-	-
		115	53.0	SZ 8040.20 x 115	159.0	SZ 8045.20 x 115	-	-	-	-	-
		127	47.5	SZ 8040.20 x 127	146.0	SZ 8045.20 x 127	-	-	-	-	-
		139	43.0	SZ 8040.20 x 139	-	-	-	-	-	-	-
		152	39.0	SZ 8040.20 x 152	91.0	SZ 8045.20 x 152	-	-	-	-	-
305	21.2	SZ 8040.20 x 305	60.0	SZ 8045.20 x 305	-	-	-	-	-		
25	12.5	25	488.0	SZ 8040.25 x 025	-	-	30	4550.0	SZ 8047.25 x 030	-	-
		32	374.4	SZ 8040.25 x 032	-	-	50	2000.0	SZ 8047.25 x 050	-	-
		38	346.0	SZ 8040.25 x 038	-	-	60	1500.0	SZ 8047.25 x 060	-	-
		44	244.0	SZ 8040.25 x 044	1158.0	SZ 8045.25 x 044	75	1250.0	SZ 8047.25 x 075	-	-
		51	207.5	SZ 8040.25 x 051	933.0	SZ 8045.25 x 051	100	830.0	SZ 8047.25 x 100	-	-
		64	161.0	SZ 8040.25 x 064	730.0	SZ 8045.25 x 064	125	710.0	SZ 8047.25 x 125	-	-
		76	130.8	SZ 8040.25 x 076	556.0	SZ 8045.25 x 076	-	-	-	-	
		89	110.5	SZ 8040.25 x 089	462.0	SZ 8045.25 x 089	-	-	-	-	
		102	96.3	SZ 8040.25 x 102	390.0	SZ 8045.25 x 102	-	-	-	-	
		115	85.7	SZ 8040.25 x 115	360.0	SZ 8045.25 x 115	-	-	-	-	
		127	76.3	SZ 8040.25 x 127	326.0	SZ 8045.25 x 127	-	-	-	-	
		139	69.5	SZ 8040.25 x 139	-	-	-	-	-	-	
		152	63.5	SZ 8040.25 x 152	255.0	SZ 8045.25 x 152	-	-	-	-	
178	53.9	SZ 8040.25 x 178	230.0	SZ 8045.25 x 178	-	-	-	-			
203	47.0	SZ 8040.25 x 203	202.0	SZ 8045.25 x 203	-	-	-	-			
305	30.9	SZ 8040.25 x 305	136.0	SZ 8045.25 x 305	-	-	-	-			
32	8	-	-	-	-	-	35	-	-	6280.0	SZ 8049.32 x 035
		-	-	-	-	-	50	-	-	3580.0	SZ 8049.32 x 050
		-	-	-	-	-	75	-	-	2080.0	SZ 8049.32 x 075
		-	-	-	-	-	100	-	-	1480.0	SZ 8049.32 x 100
32	16	38	528.2	SZ 8040.32 x 038	-	-	35	5360.0	SZ 8047.32 x 035	-	-
		44	424.4	SZ 8040.32 x 044	1300.0	SZ 8045.32 x 044	50	3000.0	SZ 8047.32 x 050	-	-
		51	353.0	SZ 8040.32 x 051	1150.0	SZ 8045.32 x 051	75	1670.0	SZ 8047.32 x 075	-	-
		64	269.2	SZ 8040.32 x 064	887.0	SZ 8045.32 x 064	100	1200.0	SZ 8047.32 x 100	-	-
		76	218.5	SZ 8040.32 x 076	733.0	SZ 8045.32 x 076	125	940.0	SZ 8047.32 x 125	-	-
		89	180.3	SZ 8040.32 x 089	612.0	SZ 8045.32 x 089	150	810.0	SZ 8047.32 x 150	-	-
		102	155.0	SZ 8040.32 x 102	544.0	SZ 8045.32 x 102	-	-	-	-	
		115	140.4	SZ 8040.32 x 115	494.0	SZ 8045.32 x 115	-	-	-	-	
		127	124.0	SZ 8040.32 x 127	432.0	SZ 8045.32 x 127	-	-	-	-	
		139	112.0	SZ 8040.32 x 139	-	-	-	-	-	-	
		152	102.0	SZ 8040.32 x 152	356.0	SZ 8045.32 x 152	-	-	-	-	
		178	88.2	SZ 8040.32 x 178	304.0	SZ 8045.32 x 178	-	-	-	-	
		203	76.0	SZ 8040.32 x 203	265.0	SZ 8045.32 x 203	-	-	-	-	
254	60.8	SZ 8040.32 x 254	214.0	SZ 8045.32 x 254	-	-	-	-			
305	49.0	SZ 8040.32 x 305	177.0	SZ 8045.32 x 305	-	-	-	-			
38	10	-	-	-	-	-	40	-	-	6880.0	SZ 8049.40 x 040
		-	-	-	-	-	50	-	-	4830.0	SZ 8049.40 x 050
		-	-	-	-	-	75	-	-	2720.0	SZ 8049.40 x 075
		-	-	-	-	-	100	-	-	1900.0	SZ 8049.40 x 100
38	20	-	-	-	-	-	40	5710.0	SZ 8047.40 x 040	-	-
		-	-	-	-	-	50	4000.0	SZ 8047.40 x 050	-	-
		-	-	-	-	-	75	2220.0	SZ 8047.40 x 075	-	-
		-	-	-	-	-	100	1540.0	SZ 8047.40 x 100	-	-
		-	-	-	-	-	150	1050.0	SZ 8047.40 x 150	-	-
		-	-	-	-	-	200	740.0	SZ 8047.40 x 200	-	-

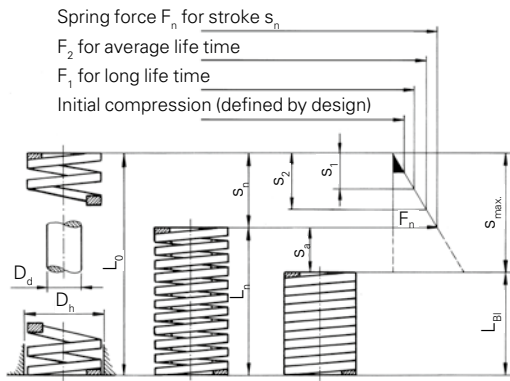
System springs

quick overview

Sleeves Ø	Pin Ø	Unloaded Length L ₀	Yellow particularly heavy load		Bronze extra heavy load		Unloaded Length L ₀	Black extra, extra heavy load		Black double extra, extra heavy load	
D _h ^{H15}	D _{dh15}	L ₀	c	Order number	c	Order number	L ₀	c	Order number	c	Order number
40	20	51	628.0	SZ 8040.40 x 051	–	–	–	–	–	–	–
		64	487.0	SZ 8040.40 x 064	1228.0	SZ 8045.40 x 064	–	–	–	–	–
		76	379.0	SZ 8040.40 x 076	1017.0	SZ 8045.40 x 076	–	–	–	–	–
		89	321.0	SZ 8040.40 x 089	880.0	SZ 8045.40 x 089	–	–	–	–	–
		102	281.0	SZ 8040.40 x 102	762.0	SZ 8045.40 x 102	–	–	–	–	–
		115	245.0	SZ 8040.40 x 115	679.0	SZ 8045.40 x 115	–	–	–	–	–
		127	221.0	SZ 8040.40 x 127	622.0	SZ 8045.40 x 127	–	–	–	–	–
		139	195.0	SZ 8040.40 x 139	–	–	–	–	–	–	–
		152	168.0	SZ 8040.40 x 152	509.0	SZ 8045.40 x 152	–	–	–	–	–
		178	150.0	SZ 8040.40 x 178	429.0	SZ 8045.40 x 178	–	–	–	–	–
		203	132.0	SZ 8040.40 x 203	374.0	SZ 8045.40 x 203	–	–	–	–	–
		254	107.0	SZ 8040.40 x 254	296.0	SZ 8045.40 x 254	–	–	–	–	–
		305	87.8	SZ 8040.40 x 305	246.0	SZ 8045.40 x 305	–	–	–	–	–
50	12.5	–	–	–	–	–	60	–	–	6645.0	SZ 8049.50 x 060
		–	–	–	–	–	75	–	–	5135.0	SZ 8049.50 x 075
		–	–	–	–	–	100	–	–	3560.0	SZ 8049.50 x 100
		–	–	–	–	–	125	–	–	2810.0	SZ 8049.50 x 125
50	25	64	709.0	SZ 8040.50 x 064	1980.0	SZ 8045.50 x 064	60	5145.0	SZ 8047.50 x 060	–	–
		76	572.0	SZ 8040.50 x 076	1811.0	SZ 8045.50 x 076	75	3885.0	SZ 8047.50 x 075	–	–
		89	475.0	SZ 8040.50 x 089	1410.0	SZ 8045.50 x 089	100	2730.0	SZ 8047.50 x 100	–	–
		102	405.0	SZ 8040.50 x 102	1215.0	SZ 8045.50 x 102	125	2100.0	SZ 8047.50 x 125	–	–
		115	352.0	SZ 8040.50 x 115	1076.0	SZ 8045.50 x 115	150	1680.0	SZ 8047.50 x 150	–	–
		127	316.0	SZ 8040.50 x 127	968.0	SZ 8045.50 x 127	200	1208.0	SZ 8047.50 x 200	–	–
		139	289.0	SZ 8040.50 x 139	–	–	–	–	–	–	–
		152	239.0	SZ 8040.50 x 152	806.0	SZ 8045.50 x 152	–	–	–	–	–
		178	216.0	SZ 8040.50 x 178	698.0	SZ 8045.50 x 178	–	–	–	–	–
		203	187.0	SZ 8040.50 x 203	612.0	SZ 8045.50 x 203	–	–	–	–	–
63	38	76	842.0	SZ 8040.63 x 076	–	–	–	–	–	–	–
		89	726.0	SZ 8040.63 x 089	1517.0	SZ 8045.63 x 089	–	–	–	–	–
		102	656.0	SZ 8040.63 x 102	1295.0	SZ 8045.63 x 102	–	–	–	–	–
63	38	115	534.0	SZ 8040.63 x 115	1070.0	SZ 8045.63 x 115	–	–	–	–	–
		127	480.0	SZ 8040.63 x 127	979.0	SZ 8045.63 x 127	–	–	–	–	–
		152	396.0	SZ 8040.63 x 152	775.0	SZ 8045.63 x 152	–	–	–	–	–
		178	335.0	SZ 8040.63 x 178	630.0	SZ 8045.63 x 178	–	–	–	–	–
		203	297.0	SZ 8040.63 x 203	546.0	SZ 8045.63 x 203	–	–	–	–	–
		254	235.0	SZ 8040.63 x 254	423.0	SZ 8045.63 x 254	–	–	–	–	–
		305	194.0	SZ 8040.63 x 305	349.0	SZ 8045.63 x 305	–	–	–	–	–

System springs SZ 8005

for extra light load, identification colour lilac



Helical compression spring for extra light load

Material:
Profiled valve spring steel wire (52SiCrNi5)

The springs are set, installed and rectangular ground at a right angle.

Order example: System spring for extra light load **SZ 8005**
 $D_h = 25 \text{ mm}$, $L_0 = 76 \text{ mm}$
 Addition **25 x 076**
 Order number **SZ 8005.25 x 076**

Add size to order number


Order number **SZ 8005.**

x

Sleeves	Pin	Wire	Unloaded Length	Spring rate	Long life time	Max. stroke			
$\varnothing D_h^{H15}$	$\varnothing D_{dh15}$		L_0	in N/mm $c \pm 10\%$	$s_1 = 35\%$ in mm	F_1 in N	$s_2 = 50\%$ in mm	F_2 in N	
10	5	2.1 x 0.9	25	8.5	8.8	74	12.5	106	10 x 025
			32	6.5	11.2	73	16.0	104	10 x 032
			38	5.5	13.3	73	19.0	105	10 x 038
			44	5.0	15.4	77	22.0	110	10 x 044
			51	4.5	17.9	80	25.5	115	10 x 051
			64	3.3	22.4	74	32.0	106	10 x 064
			76	3.2	26.6	85	38.0	122	10 x 076
12.5	6.3	2.5 x 1.2	305	0.6	106.8	64	152.5	92	10 x 305
			25	15.5	8.8	136	12.5	194	13 x 025
			32	12.2	11.2	137	16.0	195	13 x 032
			38	10.3	13.3	137	19.0	196	13 x 038
			44	8.7	15.4	134	22.0	191	13 x 044
			51	7.5	17.9	134	25.5	191	13 x 051
			64	5.8	22.4	130	32.0	186	13 x 064
16	8	3.4 x 1.2	76	4.7	26.6	125	38.0	179	13 x 076
			89	4.1	31.2	128	44.5	182	13 x 089
			102	3.6	35.7	129	51.0	184	13 x 102
			305	1.2	106.8	128	152.5	183	13 x 305
			25	20.2	8.8	177	12.5	253	16 x 025
			32	14.4	11.2	161	16.0	230	16 x 032
			38	12.3	13.3	164	19.0	234	16 x 038
20	10	4.0 x 1.7	44	10.6	15.4	163	22.0	233	16 x 044
			51	8.9	17.9	159	25.5	227	16 x 051
			64	7.0	22.4	157	32.0	224	16 x 064
			76	5.8	26.6	154	38.0	220	16 x 076
			89	4.8	31.2	150	44.5	214	16 x 089
			102	4.0	35.7	143	51.0	204	16 x 102
			115	3.9	40.3	157	57.5	224	16 x 115
20	10	4.0 x 1.7	305	1.5	106.8	160	152.5	229	16 x 305
			25	32.1	8.8	281	12.5	401	20 x 025
			32	24.7	11.2	277	16.0	395	20 x 032
			38	20.7	13.3	275	19.0	393	20 x 038
			44	17.8	15.4	274	22.0	392	20 x 044
			51	15.3	17.9	273	25.5	390	20 x 051
			64	12.1	22.4	271	32.0	387	20 x 064
			76	10.2	26.6	271	38.0	388	20 x 076
			89	8.6	31.2	268	44.5	383	20 x 089
			102	7.5	35.7	268	51.0	383	20 x 102
20	10	4.0 x 1.7	115	6.7	40.3	270	57.5	385	20 x 115
			127	6.1	44.5	271	63.5	387	20 x 127
			139	5.5	48.7	268	69.5	382	20 x 139
			152	5.1	53.2	271	76.0	388	20 x 152
			305	2.5	106.8	267	152.5	381	20 x 305

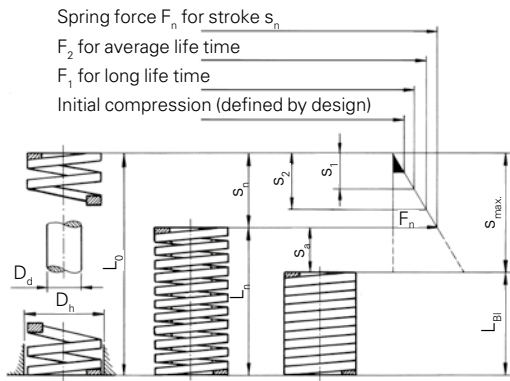
Order number **SZ 8005**.



Sleeves	Pin	Wire	Unloaded Length	Spring rate	Long life time	F ₁	Max. stroke	F ₂				
Ø D _h ^{H15}	Ø D _{dh15}		L ₀	in N/mm c ± 10 %	s ₁ = 35 % in mm	in N	s ₂ = 50 % in mm	in N				
25	12.5	5.4 x 2.2	25	52.7	8.8	461	12.5	659	25 x 025			
			32	40.0	11.2	448	16.0	640	25 x 032			
			38	33.3	13.3	443	19.0	633	25 x 038			
			44	28.6	15.4	440	22.0	629	25 x 044			
			51	24.7	17.9	441	25.5	630	25 x 051			
			64	19.4	22.4	435	32.0	621	25 x 064			
			76	16.3	26.6	434	38.0	619	25 x 076			
			89	13.9	31.2	433	44.5	619	25 x 089			
			102	12.1	35.7	432	51.0	617	25 x 102			
			115	10.8	40.3	435	57.5	621	25 x 115			
			127	9.8	44.5	436	63.5	622	25 x 127			
			139	8.9	48.7	433	69.5	619	25 x 139			
			152	8.1	53.2	431	76.0	616	25 x 152			
			178	6.9	62.3	430	89.0	614	25 x 178			
203	6.1	71.1	433	101.5	619	25 x 203						
305	4.0	106.8	427	152.5	610	25 x 305						
32	16	6.4 x 2.7	38	43.8	13.3	583	19.0	832	32 x 038			
			44	37.5	15.4	578	22.0	825	32 x 044			
			51	32.3	17.9	577	25.5	824	32 x 051			
			64	25.4	22.4	569	32.0	813	32 x 064			
			76	21.3	26.6	567	38.0	809	32 x 076			
			89	18.1	31.2	564	44.5	805	32 x 089			
			102	15.8	35.7	564	51.0	806	32 x 102			
			115	13.9	40.3	559	57.5	799	32 x 115			
			127	12.6	44.5	560	63.5	800	32 x 127			
			139	11.4	48.7	555	69.5	792	32 x 139			
			152	10.5	53.2	559	76.0	798	32 x 152			
			178	8.9	62.3	554	89.0	792	32 x 178			
			203	7.8	71.1	554	101.5	792	32 x 203			
			254	6.2	88.9	551	127.0	787	32 x 254			
305	5.2	106.8	555	152.5	793	32 x 305						
40	20	7.8 x 3.4	51	50.8	17.9	907	25.5	1295	40 x 051			
			64	39.7	22.4	889	32.0	1270	40 x 064			
			76	33.1	26.6	880	38.0	1258	40 x 076			
			89	28.1	31.2	875	44.5	1250	40 x 089			
			102	24.5	35.7	875	51.0	1250	40 x 102			
			115	21.6	40.3	869	57.5	1242	40 x 115			
			127	19.5	44.5	867	63.5	1238	40 x 127			
			139	17.8	48.7	866	69.5	1237	40 x 139			
			152	16.3	53.2	867	76.0	1239	40 x 152			
			178	13.8	62.3	860	89.0	1228	40 x 178			
			203	12.1	71.1	860	101.5	1228	40 x 203			
			254	9.7	88.9	862	127.0	1232	40 x 254			
			305	8.0	106.8	854	152.5	1220	40 x 305			
			50	25	10.7 x 4.4	64	80.2	22.4	1796	32.0	2566	50 x 064
76	66.9	26.6				1780	38.0	2542	50 x 076			
89	56.6	31.2				1763	44.5	2519	50 x 089			
102	49.3	35.7				1760	51.0	2514	50 x 102			
115	43.5	40.3				1751	57.5	2501	50 x 115			
127	39.3	44.5				1747	63.5	2496	50 x 127			
139	35.8	48.7				1742	69.5	2488	50 x 139			
152	32.8	53.2				1745	76.0	2493	50 x 152			
178	27.8	62.3				1732	89.0	2474	50 x 178			
203	24.2	71.1				1719	101.5	2456	50 x 203			
254	19.2	88.9				1707	127.0	2438	50 x 254			
305	16.0	106.8				1708	152.5	2440	50 x 305			
63	38	11.4 x 5.1				76	57.8	26.6	1537	38.0	2196	63 x 076
						89	51.4	31.2	1601	44.5	2287	63 x 089
			102	44.4	35.7	1585	51.0	2264	63 x 102			
			115	41.6	40.3	1674	57.5	2392	63 x 115			
			127	33.2	44.5	1476	63.5	2108	63 x 127			
			152	27.4	53.2	1458	76.0	2082	63 x 152			
			178	24.0	62.3	1495	89.0	2136	63 x 178			
			203	21.0	71.1	1492	101.5	2132	63 x 203			
			254	16.4	88.9	1458	127.0	2083	63 x 254			
			305	13.6	106.8	1452	152.5	2074	63 x 305			

System springs SZ 8010

for light load, identification colour green



ISO 10243

Helical compression springs for light load

Material:

Profiled valve spring steel wire (52SiCrNi5)

The springs are set, installed and rectangular ground.

Order example: System spring for light load **SZ 8010**

$D_h = 25 \text{ mm}$, $L_0 = 76 \text{ mm}$


Addition **25 x 076**


Order number **SZ 8010.25 x 076**

Add size to order number

Order number **SZ 8010.**

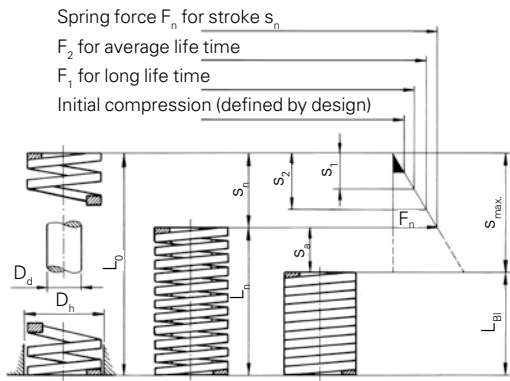
x

Sleeves	Pin	Wire	Unloaded Length L_0	Spring rate in N/mm $c \pm 10\%$	Long life time $s_1 = 30\%$ in mm	F_1 in N	Max. stroke $s_2 = 40\%$ in mm	F_2 in N	
$\varnothing D_h^{H15}$	$\varnothing D_{dh15}$								
10	5	1.7 x 1.1	25	10.0	7.5	75	10.0	100	10 x 025
			32	8.5	9.6	82	12.8	109	10 x 032
			38	6.8	11.4	78	15.2	103	10 x 038
			44	6.0	13.2	79	17.6	106	10 x 044
			51	5.0	15.3	77	20.4	102	10 x 051
			64	4.3	19.2	83	25.6	110	10 x 064
			76	3.2	22.8	73	30.4	97	10 x 076
			305	1.1	91.5	101	122.0	134	10 x 305
12.5	6.3	2.3 x 1.5	25	17.9	7.5	134	10.0	179	13 x 025
			32	16.4	9.6	157	12.8	210	13 x 032
			38	13.6	11.4	155	15.2	207	13 x 038
			44	12.1	13.2	160	17.6	213	13 x 044
			51	11.4	15.3	174	20.4	233	13 x 051
			64	9.3	19.2	179	25.6	238	13 x 064
			76	7.1	22.8	162	30.4	216	13 x 076
			89	5.4	26.7	144	35.6	192	13 x 089
			102	4.6	30.6	141	40.8	188	13 x 102
			305	1.4	91.5	128	122.0	171	13 x 305
16	8	3.2 x 1.7	25	23.4	7.5	176	10.0	234	16 x 025
			32	22.9	9.6	220	12.8	293	16 x 032
			38	19.3	11.4	220	15.2	293	16 x 038
			44	17.1	13.2	226	17.6	301	16 x 044
			51	15.7	15.3	240	20.4	320	16 x 051
			64	10.7	19.2	205	25.6	274	16 x 064
			76	10.0	22.8	228	30.4	304	16 x 076
			89	8.6	26.7	230	35.6	306	16 x 089
			102	7.8	30.6	239	40.8	318	16 x 102
			115	7.0	34.5	242	46.0	322	16 x 115
			305	2.5	91.5	229	122.0	305	16 x 305
20	10	4.0 x 2.1	25	55.8	7.5	419	10.0	558	20 x 025
			32	45.0	9.6	432	12.8	576	20 x 032
			38	33.3	11.4	380	15.2	506	20 x 038
			44	30.0	13.2	396	17.6	528	20 x 044
			51	24.5	15.3	375	20.4	500	20 x 051
			64	20.0	19.2	384	25.6	512	20 x 064
			76	16.0	22.8	365	30.4	486	20 x 076
			89	14.0	26.7	374	35.6	498	20 x 089
			102	12.0	30.6	367	40.8	490	20 x 102
			115	10.9	34.5	376	46.0	501	20 x 115
			127	9.5	38.1	362	50.8	483	20 x 127
			139	8.4	41.7	350	55.6	467	20 x 139
			152	7.5	45.6	342	60.8	456	20 x 152
			305	4.0	91.5	366	122.0	488	20 x 305

Order number SZ 8010.													
Sleeves	Pin	Wire	Unloaded	Spring rate	Long life time		Max. stroke						
\varnothing D_h^{H15}	\varnothing D_{dh15}		Length L_0	in N/mm $c \pm 10\%$	$s_1 = 30\%$ in mm	F_1 in N	$s_2 = 40\%$ in mm	F_2 in N					
25	12.5	5.3 x 2.7	25	100.0	7.5	750	10.0	1000		25 x 025			
			32	80.3	9.6	771	12.8	1028		25 x 032			
			38	62.0	11.4	707	15.2	942		25 x 038			
			44	52.9	13.2	698	17.6	931		25 x 044			
			51	44.0	15.3	673	20.4	898		25 x 051			
			64	35.2	19.2	676	25.6	901		25 x 064			
			76	28.0	22.8	638	30.4	851		25 x 076			
			89	24.0	26.7	641	35.6	854		25 x 089			
			102	21.1	30.6	646	40.8	861		25 x 102			
			115	18.7	34.5	645	46.0	860		25 x 115			
			127	16.7	38.1	636	50.8	848		25 x 127			
			139	15.3	41.7	638	55.6	851		25 x 139			
			152	14.0	45.6	638	60.8	851		25 x 152			
			178	12.5	53.4	668	71.2	890		25 x 178			
			203	10.4	60.9	633	81.2	844		25 x 203			
305	7.0	91.5	641	122.0	854		25 x 305						
32	16	6.7 x 3.3	38	94.0	11.4	1072	15.2	1429		32 x 038			
			44	79.5	13.2	1049	17.6	1399		32 x 044			
			51	67.0	15.3	1025	20.4	1367		32 x 051			
			64	53.0	19.2	1018	25.6	1357		32 x 064			
			76	44.0	22.8	1003	30.4	1338		32 x 076			
			89	37.2	26.7	993	35.6	1324		32 x 089			
			102	32.0	30.6	979	40.8	1306		32 x 102			
			115	29.0	34.5	1001	46.0	1334		32 x 115			
			127	25.0	38.1	953	50.8	1270		32 x 127			
			139	23.0	41.7	959	55.6	1279		32 x 139			
			152	21.5	45.6	980	60.8	1307		32 x 152			
			178	18.2	53.4	972	71.2	1296		32 x 178			
			203	15.8	60.9	962	81.2	1283		32 x 203			
			254	12.5	76.2	953	101.6	1270		32 x 254			
			305	10.3	91.5	942	122.0	1257		32 x 305			
40	20	8.0 x 4.0	51	92.0	15.3	1408	20.4	1877		40 x 051			
			64	73.0	19.2	1402	25.6	1869		40 x 064			
			76	63.0	22.8	1436	30.4	1915		40 x 076			
			89	51.0	26.7	1362	35.6	1816		40 x 089			
			102	43.0	30.6	1316	40.8	1754		40 x 102			
			115	39.6	34.5	1366	46.0	1822		40 x 115			
			127	37.0	38.1	1410	50.8	1880		40 x 127			
			139	32.0	41.7	1334	55.6	1779		40 x 139			
			152	28.0	45.6	1277	60.8	1702		40 x 152			
			178	25.2	53.4	1346	71.2	1794		40 x 178			
			203	22.7	60.9	1382	81.2	1843		40 x 203			
			254	17.0	76.2	1295	101.6	1727		40 x 254			
			305	14.8	91.5	1354	122.0	1806		40 x 305			
			50	25	11.1 x 5.5	64	156.0	19.2	2995	25.6	3994		50 x 064
						76	125.0	22.8	2850	30.4	3800		50 x 076
89	109.0	26.7				2910	35.6	3880		50 x 089			
102	94.0	30.6				2876	40.8	3835		50 x 102			
115	81.0	34.5				2795	46.0	3726		50 x 115			
127	71.0	38.1				2705	50.8	3607		50 x 127			
139	66.5	41.7				2773	55.6	3697		50 x 139			
152	60.0	45.6				2736	60.8	3648		50 x 152			
178	52.0	53.4				2777	71.2	3702		50 x 178			
203	44.0	60.9				2680	81.2	3573		50 x 203			
229	38.2	68.7				2624	91.6	3499		50 x 229			
254	35.0	76.2				2667	101.6	3556		50 x 254			
305	28.5	91.5				2608	122.0	3477		50 x 305			
63	38	11.6 x 7.7				76	189.0	22.8	4309	30.4	5746		63 x 076
						89	158.0	26.7	4219	35.6	5625		63 x 089
			102	131.0	30.6	4009	40.8	5345		63 x 102			
			115	116.0	34.5	4002	46.0	5336		63 x 115			
			127	103.0	38.1	3924	50.8	5232		63 x 127			
			152	84.3	45.6	3844	60.8	5125		63 x 152			
			178	71.5	53.4	3818	71.2	5091		63 x 178			
			203	61.7	60.9	3758	81.2	5010		63 x 203			
			254	47.0	76.2	3581	101.6	4775		63 x 254			
			305	38.2	91.5	3495	122.0	4660		63 x 305			

System springs SZ 8020

for medium load, identification colour blue



ISO 10243

Helical compression springs for medium load

Material:

Profiled valve spring steel wire (52SiCrNi5)

The springs are set, installed and rectangular ground.

Order example: System spring for medium load **SZ 8020**

$D_h = 25$ mm, $L_0 = 76$ mm

Addition **25 x 076**

Order number **SZ 8020.25 x 076**

Add size to order number

Order number **SZ 8020.**

x

Sleeves \varnothing D_h^{H15}	Pin \varnothing D_{dh15}	Wire	Unloaded Length L_0	Spring rate in N/mm $c \pm 10\%$	Long life time $s_1 = 25\%$ in mm	F_1 in N	Max. stroke $s_2 = 37.5\%$ in mm	F_2 in N	
10	5	1.8 x 1.2	25	16.0	6.3	100	9.4	150	10 x 025
			32	13.0	8.0	104	12.0	156	10 x 032
			38	11.9	9.5	113	14.3	170	10 x 038
			44	10.3	11.0	113	16.5	170	10 x 044
			51	8.9	12.8	113	19.1	170	10 x 051
			64	7.5	16.0	120	24.0	180	10 x 064
			76	5.3	19.0	101	28.5	151	10 x 076
			305	1.6	76.3	122	114.4	183	10 x 305
12.5	6.3	2.5 x 1.7	25	30.0	6.3	188	9.4	281	13 x 025
			32	24.8	8.0	198	12.0	298	13 x 032
			38	21.4	9.5	203	14.3	305	13 x 038
			44	18.5	11.0	204	16.5	305	13 x 044
			51	15.5	12.8	198	19.1	296	13 x 051
			64	12.1	16.0	194	24.0	290	13 x 064
			76	10.2	19.0	194	28.5	291	13 x 076
			89	8.4	22.3	187	33.4	280	13 x 089
102	7.1	25.5	181	38.3	272	13 x 102			
305	2.1	76.3	160	114.4	240	13 x 305			
16	8	3.2 x 2.0	25	49.4	6.3	309	9.4	463	16 x 025
			32	37.1	8.0	297	12.0	445	16 x 032
			38	33.9	9.5	322	14.3	483	16 x 038
			44	30.0	11.0	330	16.5	495	16 x 044
			51	26.4	12.8	337	19.1	505	16 x 051
			64	20.5	16.0	328	24.0	492	16 x 064
			76	17.8	19.0	338	28.5	507	16 x 076
			89	15.2	22.3	338	33.4	507	16 x 089
102	13.5	25.5	344	38.3	516	16 x 102			
115	12.0	28.8	345	43.1	518	16 x 115			
305	4.8	76.3	366	114.4	549	16 x 305			
20	10	4.0 x 2.4	25	98.0	6.3	613	9.4	919	20 x 025
			32	72.6	8.0	581	12.0	871	20 x 032
			38	56.0	9.5	532	14.3	798	20 x 038
			44	47.5	11.0	523	16.5	784	20 x 044
			51	41.7	12.8	532	19.1	798	20 x 051
			64	32.3	16.0	517	24.0	775	20 x 064
			76	25.1	19.0	477	28.5	715	20 x 076
			89	22.0	22.3	490	33.4	734	20 x 089
			102	19.8	25.5	505	38.3	757	20 x 102
			115	18.1	28.8	520	43.1	781	20 x 115
			127	16.6	31.8	527	47.6	791	20 x 127
			139	15.1	34.8	525	52.1	787	20 x 139
152	13.2	38.0	502	57.0	752	20 x 152			
305	6.1	76.3	465	114.4	698	20 x 305			

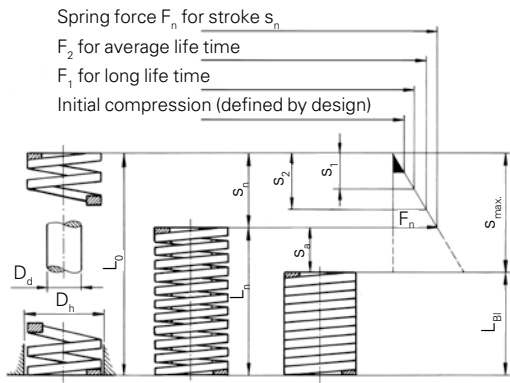
Order number **SZ 8020.**



Sleeves	Pin	Wire	Unloaded	Spring rate	Long life time		Max. stroke		
Ø	Ø		Length	in N/mm	s ₁ = 25 %	F ₁	s ₂ = 37.5 %	F ₂	
D _h ^{H15}	D _{dh15}		L ₀	c ± 10 %	in mm	in N	in mm	in N	
25	12.5	5.3 x 3.1	25	147.0	6.3	919	9.4	1378	25 x 025
			32	118.0	8.0	944	12.0	1416	25 x 032
			38	93.0	9.5	884	14.3	1325	25 x 038
			44	80.8	11.0	889	16.5	1333	25 x 044
			51	68.6	12.8	875	19.1	1312	25 x 051
			64	53.0	16.0	848	24.0	1272	25 x 064
			76	43.2	19.0	821	28.5	1231	25 x 076
			89	38.2	22.3	850	33.4	1275	25 x 089
			102	33.0	25.5	842	38.3	1262	25 x 102
			115	28.0	28.8	805	43.1	1208	25 x 115
			127	25.9	31.8	822	47.6	1233	25 x 127
			139	23.2	34.8	806	52.1	1209	25 x 139
			152	20.8	38.0	790	57.0	1186	25 x 152
			178	17.8	44.5	792	66.8	1188	25 x 178
			203	15.8	50.8	802	76.1	1203	25 x 203
305	10.2	76.3	778	114.4	1167	25 x 305			
32	16	6.8 x 4.0	38	185.0	9.5	1758	14.3	2636	32 x 038
			44	158.0	11.0	1738	16.5	2607	32 x 044
			51	134.0	12.8	1709	19.1	2563	32 x 051
			64	99.0	16.0	1584	24.0	2376	32 x 064
			76	80.5	19.0	1530	28.5	2294	32 x 076
			89	69.1	22.3	1537	33.4	2306	32 x 089
			102	58.8	25.5	1499	38.3	2249	32 x 102
			115	51.5	28.8	1481	43.1	2221	32 x 115
			127	44.8	31.8	1422	47.6	2134	32 x 127
			139	42.3	34.8	1470	51.1	2205	32 x 139
			152	37.8	38.0	1436	57.0	2155	32 x 152
			178	32.5	44.5	1446	66.8	2169	32 x 178
			203	28.9	50.8	1467	76.1	2200	32 x 203
			254	21.4	63.5	1359	95.3	2038	32 x 254
			305	18.3	76.3	1395	114.4	2093	32 x 305
40	20	8.1 x 4.8	51	181.6	12.8	2315	19.1	3473	40 x 051
			64	140.0	16.0	2240	24.0	3360	40 x 064
			76	108.0	19.0	2052	28.5	3078	40 x 076
			89	90.7	22.3	2018	33.4	3027	40 x 089
			102	81.0	25.5	2066	38.3	3098	40 x 102
			115	71.8	28.8	2064	43.1	3096	40 x 115
			127	62.7	31.8	1991	47.6	2986	40 x 127
			139	57.5	34.8	1998	52.1	2997	40 x 139
			152	51.6	38.0	1961	57.0	2941	40 x 152
			160	47.5	40.0	1900	60.0	2850	40 x 160
			178	44.1	44.5	1962	66.8	2944	40 x 178
			203	36.7	50.8	1863	76.1	2794	40 x 203
			254	30.1	63.5	1911	95.3	2867	40 x 254
			305	24.6	76.3	1876	114.4	2814	40 x 305
			50	25	10.9 x 6.0	64	209.0	16.0	3344
76	168.0	19.0				3192	28.5	4788	50 x 076
89	140.0	22.3				3115	33.4	4673	50 x 089
102	119.0	25.5				3035	38.3	4552	50 x 102
115	106.0	28.8				3048	43.1	4571	50 x 115
127	97.0	31.8				3080	47.6	4620	50 x 127
139	87.0	34.8				3023	52.1	4535	50 x 139
152	80.0	38.0				3040	57.0	4560	50 x 152
160	76.0	40.0				3040	60.0	4560	50 x 160
178	69.5	44.5				3093	66.8	4639	50 x 178
203	59.8	50.8				3035	76.1	4552	50 x 203
229	50.9	57.3				2914	85.9	4371	50 x 229
254	43.9	63.5				2788	95.3	4181	50 x 254
305	38.6	76.3				2943	114.4	4415	50 x 305
63	38	11.5 x 9.3				76	312.0	19.0	5928
			89	260.0	22.3	5785	33.4	8678	63 x 089
			102	221.0	25.5	5636	38.3	8453	63 x 102
			115	187.0	28.8	5376	43.1	8064	63 x 115
			127	168.0	31.8	5334	47.6	8001	63 x 127
			152	136.0	38.0	5168	57.0	7752	63 x 152
			160	128.0	40.0	5120	60.0	7680	63 x 160
			178	114.0	44.5	5073	66.8	7610	63 x 178
			203	100.0	50.8	5075	76.1	7613	63 x 203
			229	89.2	57.3	5107	85.9	7660	63 x 229
			254	78.4	63.5	4978	95.3	7468	63 x 254
			305	64.7	76.3	4933	114.4	7400	63 x 305
			315	62.8	78.8	4946	118.1	7418	63 x 315
			400	48.5	100.0	4850	150.0	7275	63 x 400

System springs SZ 8030

for heavy load, identification colour red



ISO 10243

Helical compression springs for heavy load

Material:

Profiled valve spring steel wire (52SiCrNi5)

The springs are set, installed and rectangular ground.

Order example: System spring for heavy load **SZ 8030**

$D_h = 25 \text{ mm}$, $L_0 = 76 \text{ mm}$

Addition **25 x 076**

Order number **SZ 8030.25 x 076**

Add size to order number


x

Order number **SZ 8030.**

Sleeves	Pin	Wire	Unloaded Length	Spring rate	Long life time		Max. stroke		
\varnothing	\varnothing		L_0	in N/mm	$s_1 = 20 \%$	F_1	$s_2 = 30 \%$	F_2	
D_h^{H15}	D_{dh15}			$c \pm 10 \%$	in mm	in N	in mm	in N	
10	5	1.8 x 1.4	25	22.1	5.0	111	7.5	166	10 x 025
			32	17.5	6.4	112	9.6	168	10 x 032
			38	17.1	7.6	130	11.4	195	10 x 038
			44	15.0	8.8	132	13.2	198	10 x 044
			51	12.8	10.2	131	15.3	196	10 x 051
			64	10.7	12.8	137	19.2	205	10 x 064
			76	7.5	15.2	114	22.8	171	10 x 076
			305	2.1	61.0	128	91.5	192	10 x 305
12.5	6.3	2.4 x 2.0	25	42.1	5.0	211	7.5	316	13 x 025
			32	33.2	6.4	212	9.6	319	13 x 032
			38	29.3	7.6	223	11.4	334	13 x 038
			44	24.6	8.8	216	13.2	325	13 x 044
			51	19.6	10.2	200	15.3	300	13 x 051
			64	15.0	12.8	192	19.2	288	13 x 064
			76	13.2	15.2	201	22.8	301	13 x 076
			89	11.4	17.8	203	26.7	304	13 x 089
102	9.4	20.4	192	30.6	288	13 x 102			
305	2.8	61.0	171	91.5	256	13 x 305			
16	8	3.0 x 2.4	25	75.7	5.0	379	7.5	568	16 x 025
			32	52.8	6.4	338	9.6	507	16 x 032
			38	48.5	7.6	369	11.4	553	16 x 038
			44	42.8	8.8	377	13.2	565	16 x 044
			51	37.1	10.2	378	15.3	568	16 x 051
			64	30.3	12.8	388	19.2	582	16 x 064
			76	25.8	15.2	392	22.8	588	16 x 076
			89	21.7	17.8	386	26.7	579	16 x 089
102	19.3	20.4	394	30.6	591	16 x 102			
115	17.0	23.0	391	34.5	587	16 x 115			
305	7.1	61.0	433	91.5	650	16 x 305			
20	10	4.0 x 3.2	25	216.0	5.0	1080	7.5	1620	20 x 025
			32	168.0	6.4	1075	9.6	1613	20 x 032
			38	129.0	7.6	980	11.4	1471	20 x 038
			44	112.0	8.8	986	13.2	1478	20 x 044
			51	94.0	10.2	959	15.3	1438	20 x 051
			64	72.1	12.8	923	19.2	1384	20 x 064
			76	59.7	15.2	907	22.8	1361	20 x 076
			89	50.5	17.8	899	26.7	1348	20 x 089
102	44.2	20.4	902	30.6	1353	20 x 102			
115	38.4	23.0	883	34.5	1325	20 x 115			
127	34.1	25.4	866	38.1	1299	20 x 127			
139	31.0	27.8	862	41.7	1293	20 x 139			
152	28.2	30.4	857	45.6	1286	20 x 152			
305	15.0	61.0	915	91.5	1373	20 x 305			

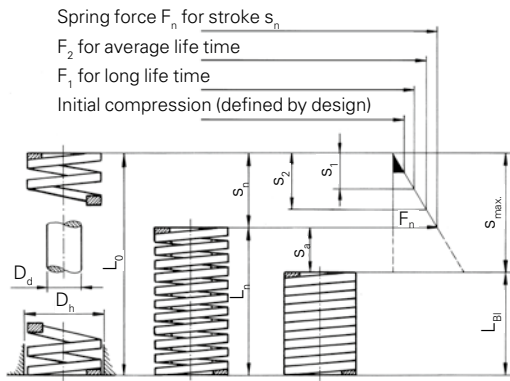
Order number **SZ 8030**.



Sleeves Ø D _h ^{H15}	Pin Ø D _{dh15}	Wire 	Unloaded Length L ₀	Spring rate in N/mm c ± 10 %	Long life time s ₁ = 20 % in mm	F ₁ in N	Max. stroke s ₂ = 30 % in mm	F ₂ in N				
25	12.5	5.6 x 4.1	25	375.0	5.0	1875	7.5	2813	25 x 025			
			32	297.0	6.4	1901	9.6	2851	25 x 032			
			38	219.0	7.6	1664	11.4	2497	25 x 038			
			44	187.0	8.8	1646	13.2	2468	25 x 044			
			51	156.0	10.2	1591	15.3	2387	25 x 051			
			64	123.0	12.8	1574	19.2	2362	25 x 064			
			76	99.0	15.2	1505	22.8	2257	25 x 076			
			89	84.0	17.8	1495	26.7	2243	25 x 089			
			102	73.0	20.4	1489	30.6	2234	25 x 102			
			115	65.0	23.0	1495	34.5	2243	25 x 115			
			127	57.7	25.4	1466	38.1	2198	25 x 127			
			139	52.7	27.8	1465	41.7	2198	25 x 139			
			152	47.8	30.4	1453	45.6	2180	25 x 152			
			178	41.0	35.6	1460	53.4	2189	25 x 178			
			203	35.8	40.6	1453	60.9	2180	25 x 203			
305	22.9	61.0	1397	91.5	2095	25 x 305						
32	16	6.9 x 5.3	38	388.0	7.6	2949	11.4	4423	32 x 038			
			44	324.0	8.8	2851	13.2	4277	32 x 044			
			51	272.0	10.2	2774	15.3	4162	32 x 051			
			64	212.0	12.8	2714	19.2	4070	32 x 064			
			76	172.0	15.2	2614	22.8	3922	32 x 076			
			89	141.0	17.8	2510	26.7	3765	32 x 089			
			102	122.0	20.4	2489	30.6	3733	32 x 102			
			115	107.0	23.0	2461	34.5	3692	32 x 115			
			127	93.0	25.4	2362	38.1	3543	32 x 127			
			139	86.0	27.8	2391	41.7	3586	32 x 139			
			152	78.0	30.4	2371	45.6	3557	32 x 152			
			178	67.2	35.6	2392	53.4	3588	32 x 178			
			203	59.1	40.6	2399	60.9	3599	32 x 203			
			254	46.4	50.8	2357	76.2	3536	32 x 254			
			305	38.0	61.0	2318	91.5	3477	32 x 305			
40	20	8.4 x 6.2	51	350.0	10.2	3570	15.3	5355	40 x 051			
			64	269.0	12.8	3443	19.2	5165	40 x 064			
			76	219.0	15.2	3329	22.8	4993	40 x 076			
			89	190.0	17.8	3382	26.7	5073	40 x 089			
			102	163.0	20.4	3325	30.6	4988	40 x 102			
			115	142.0	23.0	3266	34.5	4899	40 x 115			
			127	128.0	25.4	3251	38.1	4877	40 x 127			
			139	115.0	27.8	3197	41.7	4796	40 x 139			
			152	105.0	30.4	3192	45.6	4788	40 x 152			
			178	89.0	35.6	3168	53.4	4753	40 x 178			
			203	77.0	40.6	3126	60.9	4689	40 x 203			
			254	61.0	50.8	3099	76.2	4648	40 x 254			
			305	51.0	61.0	3111	91.5	4667	40 x 305			
			50	25	11.3 x 7.4	64	413.0	12.8	5286	19.2	7930	50 x 064
						76	339.0	15.2	5153	22.8	7729	50 x 076
89	288.0	17.8				5126	26.7	7690	50 x 089			
102	245.0	20.4				4998	30.6	7497	50 x 102			
115	215.0	23.0				4945	34.5	7418	50 x 115			
127	192.0	25.4				4877	38.1	7315	50 x 127			
139	168.0	27.8				4670	41.7	7006	50 x 139			
152	154.0	30.4				4682	45.6	7022	50 x 152			
178	134.0	35.6				4770	53.4	7156	50 x 178			
203	117.0	40.6				4750	60.9	7125	50 x 203			
254	89.0	50.8				4521	76.2	6782	50 x 254			
305	73.0	61.0				4453	91.5	6680	50 x 305			
63	38	11.2 x 12.9				76	630.0	15.2	9576	22.8	14364	63 x 076
						89	485.0	17.8	8633	26.7	12950	63 x 089
						102	434.0	20.4	8854	30.6	13280	63 x 102
			115	384.0	23.0	8832	34.5	13248	63 x 115			
			127	349.0	25.4	8865	38.1	13297	63 x 127			
			152	276.0	30.4	8390	45.6	12586	63 x 152			
			178	237.0	35.6	8437	53.4	12656	63 x 178			
			203	210.0	40.6	8526	60.9	12789	63 x 203			
			254	165.0	50.8	8382	76.2	12573	63 x 254			
			305	134.0	61.0	8174	91.5	12261	63 x 305			

System springs SZ 8040

for very heavy load, identification colour yellow



ISO 10243

Helical compression springs for very heavy load

Material:

Profiled valve spring steel wire (52SiCrNi5)

The springs are set, installed and rectangular ground.

Order example: System spring for very heavy load **SZ 8040**

$D_h = 25 \text{ mm}$, $L_0 = 76 \text{ mm}$

Addition **25 x 076**

Order number **SZ 8040.25 x 076**

Add size to order number


Order number **SZ 8040.**

x

Sleeves	Pin	Wire	Unloaded Length	Spring rate	Long life time		Max. stroke		
\varnothing	\varnothing		L_0	in N/mm	$s_1 = 17\%$	F_1	$s_2 = 25\%$	F_2	
D_h^{H15}	D_{dh15}			$c \pm 10\%$	in mm	in N	in mm	in N	
10	5	1.9 x 1.5	25	36.8	4.3	156	6.3	230	10 x 025
			32	27.9	5.4	152	8.0	223	10 x 032
			38	23.7	6.5	153	9.5	225	10 x 038
			44	19.2	7.5	144	11.0	211	10 x 044
			51	16.5	8.7	143	12.8	210	10 x 051
			64	13.2	10.9	144	16.0	211	10 x 064
			76	10.9	12.9	141	19.0	207	10 x 076
			305	2.6	51.9	135	76.3	198	10 x 305
12.5	6.3	2.3 x 2.2	25	58.5	4.3	249	6.3	366	13 x 025
			32	43.9	5.4	239	8.0	351	13 x 032
			38	36.0	6.5	233	9.5	342	13 x 038
			44	30.3	7.5	227	11.0	333	13 x 044
			51	26.2	8.7	227	12.8	334	13 x 051
			64	21.2	10.9	231	16.0	339	13 x 064
			76	17.1	12.9	221	19.0	325	13 x 076
			102	14.5	15.1	219	22.3	323	13 x 089
16	8	3.2 x 2.7	25	118.0	4.3	502	6.3	738	16 x 025
			32	89.0	5.4	484	8.0	712	16 x 032
			38	72.1	6.5	466	9.5	685	16 x 038
			44	60.9	7.5	456	11.0	670	16 x 044
			51	52.3	8.7	453	12.8	667	16 x 051
			64	41.2	10.9	448	16.0	659	16 x 064
			76	34.1	12.9	441	19.0	648	16 x 076
			89	29.5	15.1	446	22.3	656	16 x 089
20	10	4.1 x 3.7	25	293.0	4.3	1245	6.3	1831	20 x 025
			32	224.0	5.4	1219	8.0	1792	20 x 032
			38	177.0	6.5	1143	9.5	1682	20 x 038
			44	149.0	7.5	1115	11.0	1639	20 x 044
			51	128.0	8.7	1110	12.8	1632	20 x 051
			64	99.0	10.9	1077	16.0	1584	20 x 064
			76	81.7	12.9	1056	19.0	1552	20 x 076
			89	69.5	15.1	1052	22.3	1546	20 x 089
			102	60.6	17.3	1051	25.5	1545	20 x 102
			115	53.0	19.6	1036	28.8	1524	20 x 115
			127	47.5	21.6	1026	31.8	1508	20 x 127
			139	43.0	23.6	1016	34.8	1494	20 x 139
			152	39.0	25.8	1008	38.0	1482	20 x 152
			305	21.2	51.9	1099	76.3	1617	20 x 305

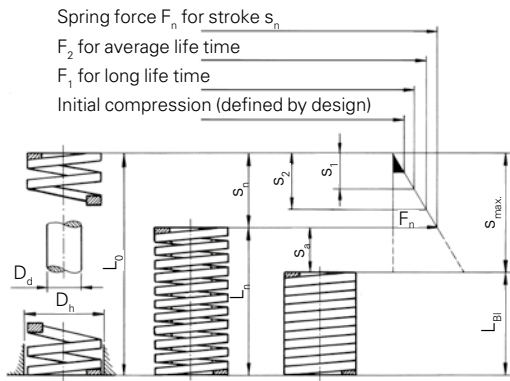
Order number **SZ 8040.**

x

Sleeves	Pin	Wire	Unloaded Length	Spring rate	Long life time	F ₁	Max. stroke	F ₂				
Ø	Ø		L ₀	in N/mm	s ₁ = 17 %	F ₁ in N	s ₂ = 25 %	F ₂ in N				
D _h ^{H15}	D _{dh15}			c ± 10 %	in mm		in mm					
25	12.5	5.6 x 4.6	25	488.0	4.3	2098	6.3	3074	25 x 025			
			32	374.4	5.4	2037	8.0	2995	25 x 032			
			38	346.0	6.5	2235	9.5	3287	25 x 038			
			44	244.0	7.5	1825	11.0	2684	25 x 044			
			51	207.5	8.7	1799	12.8	2646	25 x 051			
			64	161.0	10.9	1752	16.0	2576	25 x 064			
			76	130.8	12.9	1690	19.0	2485	25 x 076			
			89	110.5	15.1	1672	22.3	2459	25 x 089			
			102	96.3	17.3	1670	25.5	2456	25 x 102			
			115	85.7	19.6	1675	28.8	2464	25 x 115			
			127	76.3	21.6	1647	31.8	2423	25 x 127			
			139	69.5	23.6	1642	34.8	2415	25 x 139			
			152	63.5	25.8	1641	38.0	2413	25 x 152			
			178	53.9	30.3	1631	44.5	2399	25 x 178			
			203	47.0	34.5	1622	50.8	2385	25 x 203			
305	30.9	51.9	1602	76.3	2356	25 x 305						
32	16	7.2 x 5.6	38	528.2	6.5	3412	9.5	5018	32 x 038			
			44	424.4	7.5	3175	11.0	4668	32 x 044			
			51	353.0	8.7	3061	12.8	4501	32 x 051			
			64	269.2	10.9	2929	16.0	4307	32 x 064			
			76	218.5	12.9	2823	19.0	4152	32 x 076			
			89	180.3	15.1	2728	22.3	4012	32 x 089			
			102	155.0	17.3	2688	25.5	3953	32 x 102			
			115	140.0	19.6	2737	28.8	4025	32 x 115			
			127	124.0	21.6	2677	31.8	3937	32 x 127			
			139	112.0	23.6	2647	34.8	3898	32 x 139			
			152	102.0	25.8	2636	38.0	3876	32 x 152			
			178	88.2	30.3	2669	44.5	3925	32 x 178			
			203	76.0	34.5	2623	50.8	3857	32 x 203			
			254	60.8	43.2	2625	63.5	3861	32 x 254			
			305	49.0	51.9	2541	76.3	3736	32 x 305			
40	20	8.7 x 7.3	51	628.0	8.7	5445	12.8	8007	40 x 051			
			64	487.0	10.9	5299	16.0	7792	40 x 064			
			76	379.0	12.9	4897	19.0	7201	40 x 076			
			89	321.0	15.1	4857	22.3	7142	40 x 089			
			102	281.0	17.3	4873	25.5	7166	40 x 102			
			115	245.0	19.6	4790	28.8	7044	40 x 115			
			127	221.0	21.6	4771	31.8	7017	40 x 127			
			139	195.0	23.6	4602	34.8	6786	40 x 139			
			152	168.0	25.8	4341	38.0	6384	40 x 152			
			178	150.0	30.3	4545	44.5	6675	40 x 178			
			203	132.0	34.5	4555	50.8	6699	40 x 203			
			254	107.0	43.2	4620	63.5	6795	40 x 254			
			305	87.8	51.9	4552	76.3	6695	40 x 305			
			50	25	11.4 x 9.1	64	709.0	10.9	7714	16.0	11344	50 x 064
						76	572.0	12.9	7390	19.0	10868	50 x 076
89	475.0	15.1				7187	22.3	10569	50 x 089			
102	405.0	17.3				7023	25.5	10328	50 x 102			
115	352.0	19.6				6882	28.8	10120	50 x 115			
127	316.0	21.6				6822	31.8	10033	50 x 127			
139	289.0	23.6				6829	34.8	10043	50 x 139			
152	239.0	25.8				6176	38.0	9082	50 x 152			
178	216.0	30.3				6536	44.5	9612	50 x 178			
203	187.0	34.5				6453	50.8	9490	50 x 203			
254	153.0	43.2				6607	63.5	9716	50 x 254			
305	127.0	51.9				6585	76.3	9684	50 x 305			
63	38	11.8 x 13.4				76	842.0	12.9	10879	19.0	15998	63 x 076
						89	726.0	15.1	10984	22.3	16154	63 x 089
						102	656.0	17.3	11375	25.5	16728	63 x 102
			115	534.0	19.6	10440	28.8	15353	63 x 115			
			127	480.0	21.6	10363	31.8	15240	63 x 127			
			152	396.0	25.8	10233	38.0	15048	63 x 152			
			178	335.0	30.3	10137	44.5	14908	63 x 178			
			203	297.0	34.5	10249	50.8	15073	63 x 203			
			254	235.0	43.2	10147	63.5	14923	63 x 254			
			305	194.0	51.9	10059	76.3	14793	63 x 305			

System springs SZ 8045

for extra heavy load, identification colour bronze



Helical compression springs for extra heavy load

Material:
Profiled valve spring steel wire (52SiCrNi5)

The springs are set, installed and rectangular ground.

Order example: System spring for extra heavy load **SZ 8045**

$D_h = 25 \text{ mm}$, $L_0 = 89 \text{ mm}$

Addition **25 x 089**

Order number **SZ 8045.25 x 089**

Add size to order number


Order number **SZ 8045.**

x

Sleeves \varnothing D_h^{H15}	Pin \varnothing D_{dh15}	Wire	Unloaded Length L_0	Spring rate in N/mm $c \pm 10\%$	Long life time $s_1 = 10\%$ in mm	F_1 in N	Max. stroke $s_2 = 15\%$ in mm	F_2 in N	
10	5	2.2 x 2.7	25	167.0	2.5	418	3.8	626	10 x 025
			32	130.0	3.2	416	4.8	624	10 x 032
			38	105.0	3.8	399	5.7	599	10 x 038
			44	86.0	4.4	378	6.6	568	10 x 044
			51	79.0	5.1	403	7.7	604	10 x 051
			64	62.0	6.4	397	9.6	595	10 x 064
			76	51.0	7.6	388	11.4	581	10 x 076
12.5	6.3	2.8 x 3.4	25	288.0	2.5	720	3.8	1080	13 x 025
			32	216.0	3.2	691	4.8	1037	13 x 032
			38	176.0	3.8	669	5.7	1003	13 x 038
			44	149.0	4.4	656	6.6	983	13 x 044
			51	128.0	5.1	653	7.7	979	13 x 051
			64	100.0	6.4	640	9.6	960	13 x 064
			76	84.0	7.6	638	11.4	958	13 x 076
			89	71.0	8.9	632	13.4	948	13 x 089
16	8	3.5 x 4.6	102	61.0	10.2	622	15.3	933	13 x 102
			32	449.0	3.2	1437	4.8	2155	16 x 032
			38	363.0	3.8	1379	5.7	2069	16 x 038
			44	309.9	4.4	1360	6.6	2039	16 x 044
			51	256.0	5.1	1306	7.7	1958	16 x 051
			64	203.0	6.4	1299	9.6	1949	16 x 064
			76	166.0	7.6	1262	11.4	1892	16 x 076
			89	139.0	8.9	1237	13.4	1856	16 x 089
			102	114.0	10.2	1163	15.3	1744	16 x 102
			115	105.0	11.5	1208	17.3	17.3	16 x 115
20	10	4.1 x 5.9	127	94.0	12.7	1194	19.1	1791	16 x 127
			152	69.0	15.2	1049	22.8	1573	16 x 152
			305	37.0	30.5	1129	45.8	1693	16 x 305
			44	452.0	4.4	1989	6.6	2983	20 x 044
			51	378.0	5.1	1928	7.7	2892	20 x 051
			64	301.0	6.4	1926	9.6	2890	20 x 064
			76	247.0	7.6	1877	11.4	2816	20 x 076
			89	208.0	8.9	1851	13.4	2777	20 x 089
			102	188.0	10.2	1918	15.3	2876	20 x 102
			115	159.0	11.5	1829	17.3	2743	20 x 115
20	10	4.1 x 5.9	127	146.0	12.7	1854	19.1	2781	20 x 127
			152	121.0	15.2	1839	22.8	2759	20 x 152
			305	60.0	30.5	1830	45.8	2745	20 x 305

Order number **SZ 8045.**

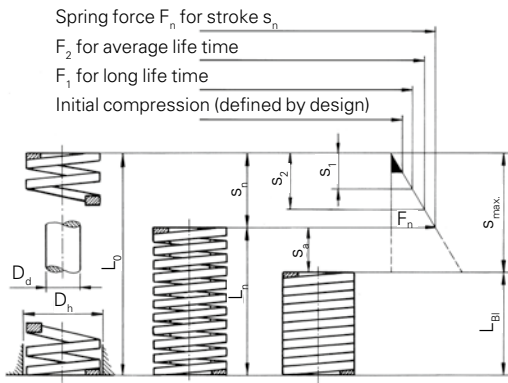
x

Sleeves Ø D _h ^{H15}	Pin Ø D _{dh15}	Wire 	Unloaded Length L ₀	Spring rate in N/mm c ± 10 %	Long life time s ₁ = 10 % in mm	F ₁ in N	Max. stroke s ₂ = 15 % in mm	F ₂ in N	
25	12.5	5.7 x 7.4	44	1158.0	4.4	5095	6.6	7643	25 x 044
			51	933.0	5.1	4758	7.7	7137	25 x 051
			64	730.0	6.4	4672	9.6	7008	25 x 064
			76	556.0	7.6	4226	11.4	6338	25 x 076
			89	462.0	8.9	4112	13.4	6168	25 x 089
			102	390.0	10.2	3978	15.3	5967	25 x 102
			115	360.0	11.5	4140	17.3	6210	25 x 115
			127	326.0	12.7	4140	19.1	6210	25 x 127
			152	255.0	15.2	3876	22.8	5814	25 x 152
			178	230.0	17.8	4094	26.7	6141	25 x 178
			203	202.0	20.3	4101	30.5	6151	25 x 203
305	136.0	30.5	4148	45.8	6222	25 x 305			
32	16	7.4 x 8.8	44	1300.0	4.4	5720	6.6	8580	32 x 044
			51	1150.0	5.1	5865	7.7	8798	32 x 051
			64	887.0	6.4	5677	9.6	8515	32 x 064
			76	733.0	7.6	5571	11.4	8356	32 x 076
			89	612.0	8.9	5447	13.4	8170	32 x 089
			102	544.0	10.2	5549	15.3	8323	32 x 102
			115	494.0	11.5	5681	17.3	8522	32 x 115
			127	432.0	12.7	5486	19.1	8230	32 x 127
			152	356.0	15.2	5411	22.8	8117	32 x 152
			178	304.0	17.8	5411	26.7	8117	32 x 178
			203	265.0	20.3	5380	30.5	8069	32 x 203
254	214.0	25.4	5436	38.1	8153	32 x 254			
305	177.0	30.5	5399	45.8	8098	32 x 305			
40	20	8.4 x 10.9	64	1228.0	6.4	7859	9.6	11789	40 x 064
			76	1017.0	7.6	7729	11.4	11594	40 x 076
			89	880.0	8.9	7832	13.4	11748	40 x 089
			102	762.0	10.2	7772	15.3	11659	40 x 102
			115	679.0	11.5	7809	17.3	11713	40 x 115
			127	622.0	12.7	7899	19.1	11849	40 x 127
			152	509.0	15.2	7737	22.8	11605	40 x 152
			178	429.0	17.8	7636	26.7	11454	40 x 178
			203	374.0	20.3	7592	30.5	11388	40 x 203
			254	296.0	25.4	7518	38.1	11278	40 x 254
			305	246.0	30.5	7503	45.8	11255	40 x 305
50	25	11.8 x 13.4	64	1980.0	6.4	12672	9.6	19008	50 x 064
			76	1811.0	7.6	13764	11.4	20645	50 x 076
			89	1410.0	8.9	12549	13.4	18824	50 x 089
			102	1215.0	10.2	12393	15.3	18590	50 x 102
			115	1076.0	11.5	12374	17.3	18561	50 x 115
			127	968.0	12.7	12294	19.1	18440	50 x 127
			152	806.0	15.2	12251	22.8	18377	50 x 152
			178	698.0	17.8	12424	26.7	18637	50 x 178
			203	612.0	20.3	12424	30.5	18635	50 x 203
			254	472.0	25.4	11989	38.1	17983	50 x 254
			305	388.0	30.5	11834	45.8	17751	50 x 305
63	38	11.8 x 17.8	89	1517.0	12.6	19172	17.8	27003	63 x 089
			102	1295.0	14.5	18757	20.9	27078	63 x 102
			115	1070.0	17.5	18704	25.1	26825	63 x 115
			127	979.0	19.1	18650	27.3	26732	63 x 127
			152	775.0	24.3	18848	34.2	26505	63 x 152
			178	630.0	29.4	18503	41.8	26353	63 x 178
			203	546.0	33.9	18510	48.5	26490	63 x 203
			254	423.0	44.5	18802	62.2	26323	63 x 254
305	349.0	53.4	18628	74.7	26079	63 x 305			

System springs SZ 8047

for extra, extra heavy load, identification colour black

STEINEL®



Helical compression spring for extra, extra heavy load

Material:

Profiled valve spring steel wire

The springs are set, installed and rectangular ground at a right angle.

Order example: System spring for extra heavy load **SZ 8047**

$D_h = 40 \text{ mm}$, $L_0 = 100 \text{ mm}$, $F_N = 20000 \text{ N}$

Addition **40 x 100**

Order number **SZ 8047.40 x 100**

Add size to order number

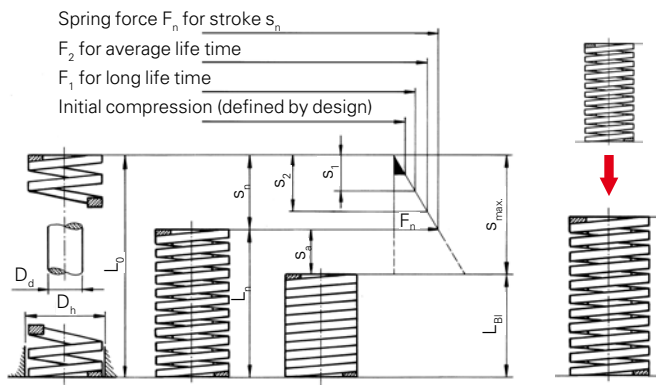
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Order number **SZ 8047.**

Sleeves	Pin	Unloaded Length	Spring rate	Long life time		
\varnothing	\varnothing	$L_{\pm 0.5\%}$ $L_{\text{min. } 0.2 \text{ mm}}$	in N/mm	s_{max}	F_{max}	
D_h^{H15}	D_{dh15}		$c \pm 10\%$	in mm	in N	
10	5	20	580.0	2.2	1250	10 x 020
		30	360.0	3.5	1250	10 x 030
		40	260.0	4.8	1250	10 x 040
		50	200.0	6.0	1250	10 x 050
12.5	6.3	20	850.0	2.4	2000	13 x 020
		30	590.0	3.3	2000	13 x 030
		40	400.0	5.0	2000	13 x 040
		50	320.0	6.0	2000	13 x 050
16	8	20	1650.0	2.1	3500	16 x 020
		35	920.0	3.8	3500	16 x 035
		50	580.0	6.0	3500	16 x 050
		75	410.0	8.5	3500	16 x 075
		100	280.0	12.5	3500	16 x 100
19	10	25	2270.0	2.2	5000	20 x 025
		40	1160.0	4.3	5000	20 x 040
		50	830.0	6.0	5000	20 x 050
		75	500.0	10.0	5000	20 x 075
		100	360.0	14.0	5000	20 x 100
25	12.5	30	4550.0	2.2	10000	25 x 030
		50	2000.0	5.0	10000	25 x 050
		60	1500.0	6.5	10000	25 x 060
		75	1250.0	8.0	10000	25 x 075
		100	830.0	12.0	10000	25 x 100
		125	710.0	14.0	10000	25 x 125
32	16	35	5360.0	2.8	15000	32 x 035
		50	3000.0	5.0	15000	32 x 050
		75	1670.0	9.0	15000	32 x 075
		100	1200.0	12.5	15000	32 x 100
		125	940.0	16.0	15000	32 x 125
		150	810.0	18.5	15000	32 x 150
38	20	40	5710.0	3.5	20000	40 x 040
		50	4000.0	5.0	20000	40 x 050
		75	2220.0	9.0	20000	40 x 075
		100	1540.0	13.0	20000	40 x 100
		150	1050.0	19.0	20000	40 x 150
50	25	200	740.0	27.0	20000	40 x 200
		60	5145.0	6.7	35000	50 x 060
		75	3885.0	8.6	35000	50 x 075
		100	2730.0	12.5	35000	50 x 100
		125	2100.0	16.0	35000	50 x 125
		150	1680.0	20.0	35000	50 x 150
		200	1208.0	29.0	35000	50 x 200

System springs SZ 8049

for extra, extra heavy load, identification colour black, double



Helical compression spring for extra, extra heavy load

Material:
Profiled valve spring steel wire

The springs are set, installed and rectangular ground at a right angle.

Order example: System spring for extra heavy load **SZ 8049**
 $D_h = 40$ mm, $L_0 = 100$ mm, $F_N = 25000$ N
 Addition **40 x 100**
 Order number **SZ 8049.40 x 100**

Add size to order number

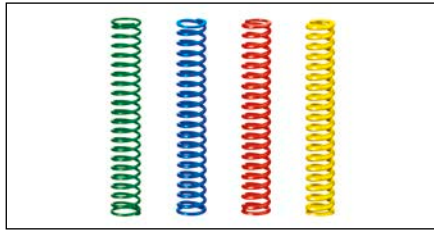
Order number **SZ 8049.**

x

Sleeves	Pin	Unloaded Length	Spring rate	Long life time		
\varnothing	\varnothing	$L_0 \pm 0.5\%$ $L_0 \text{ min. } 0.2 \text{ mm}$	in N/mm $c \pm 10\%$	s_{max} in mm	F_{max} in N	
D_h^{H15}	D_{dh15}					
32	8	35	6280.0	3.0	18500	32 x 035
		50	3580.0	5.2	18500	32 x 050
		75	2080.0	9.0	18500	32 x 075
		100	1480.0	12.5	18500	32 x 100
38	10	40	6880.0	3.6	25000	40 x 040
		50	4830.0	5.2	25000	40 x 050
		75	2720.0	9.2	25000	40 x 075
		100	1900.0	13.2	25000	40 x 100
50	12.5	60	6645.0	6.7	45000	50 x 060
		75	5135.0	8.6	45000	50 x 075
		100	3560.0	12.5	45000	50 x 100
		125	2810.0	16.0	45000	50 x 125

System springs

small series



System springs, small series (4 types of load)

Material:

Spring steel wire in accordance with EN 10270-1 DH (type D)

The springs are set, closed at both ends per 1 winding and ground.

Note:

The spring must always be pre-loaded.
The table contains the maximum permissible strokes with 1 mm pre-load for long life time.

When a pre-load greater than 1 mm is selected, the maximum stroke is reduced, and DIN EN 13906 must be taken into account for the design.

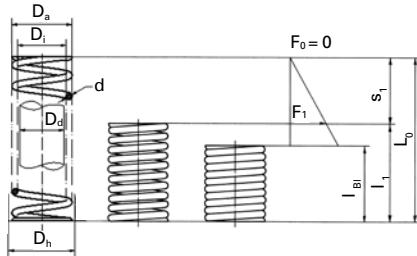
We would be happy to help you with the design in any way we can.

Order example: System spring, small series, light load (green) **SZ 8111**

$D_a = 6 \text{ mm}$, $l_0 = 25 \text{ mm}$

Addition **06 x 25**

Order number **SZ 8111.06 x 25**



Add size to order number

Pressure spring, light load (green) Order number **SZ 8111**

x

$\varnothing D_h^{H15}$	$\varnothing D_{dh15}$	$\varnothing D_a$	$\varnothing D_i$	Wire $\varnothing d$	L_0	c Spring rate (N/mm)	Long life time s_1 bei 1 mm pre-load in mm	F_1 in N	Standard pack	
6.3	4.4	6	4.7	0.6	16	1.534	5.20	7.98	20	06 x 016
6.3	4.4	6	4.7	0.6	25	0.844	8.50	7.17	20	06 x 025
6.3	4.4	6	4.7	0.6	38	0.527	14.00	7.38	20	06 x 038
6.3	4.4	6	4.7	0.6	51	0.383	19.00	7.28	20	06 x 051
8.3	5.9	8	6.2	0.8	16	2.250	6.00	13.50	20	08 x 016
8.3	5.9	8	6.2	0.8	25	1.250	11.00	13.75	20	08 x 025
8.3	5.9	8	6.2	0.8	38	0.803	16.00	12.85	20	08 x 038
8.3	5.9	8	6.2	0.8	51	0.562	23.00	12.93	20	08 x 051

Pressure spring, medium load (blue) Order number **SZ 8112**.

x

$\varnothing D_h^{H15}$	$\varnothing D_{dh15}$	$\varnothing D_a$	$\varnothing D_i$	$\varnothing d$	L_0	c Spring rate (N/mm)	Long life time s_1 with 1 mm pre-load in mm	F_1 in N	Standard pack	
6.3	3.9	6	4.2	0.8	16	5.430	3.20	17.38	20	06 x 016
6.3	3.9	6	4.2	0.8	25	3.000	6.00	18.00	20	06 x 025
6.3	3.9	6	4.2	0.8	38	1.866	9.50	17.73	20	06 x 038
6.3	3.9	6	4.2	0.8	51	1.537	12.50	16.96	20	06 x 051
8.3	5.5	8	5.8	1.0	16	7.470	3.30	24.65	20	08 x 016
8.3	5.5	8	5.8	1.0	25	3.730	6.60	24.62	20	08 x 025
8.3	5.5	8	5.8	1.0	38	2.300	10.80	24.84	20	08 x 038
8.3	5.5	8	5.8	1.0	51	1.660	15.00	24.90	20	08 x 051

Pressure spring, heavy load (red) Order number **SZ 8113**.

x

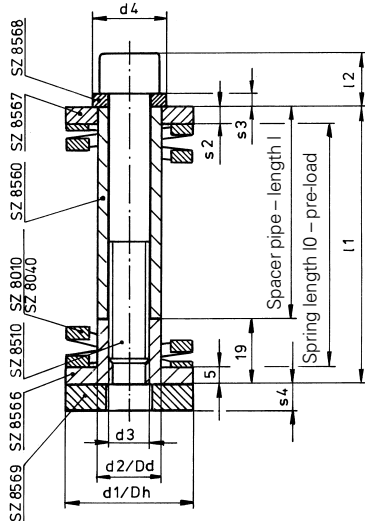
$\varnothing D_h^{H15}$	$\varnothing D_{dh15}$	$\varnothing D_a$	$\varnothing D_i$	$\varnothing d$	L_0	c Spring rate (N/mm)	Long life time s_1 with 1 mm pre-load in mm	F_1 in N	Standard pack	
6.3	3.6	6	3.9	1.0	16	16.400	2.10	34.44	20	06 x 016
6.3	3.6	6	3.9	1.0	25	9.111	3.80	34.62	20	06 x 025
6.3	3.6	6	3.9	1.0	38	5.857	5.90	34.56	20	06 x 038
6.3	3.6	6	3.9	1.0	51	4.100	8.40	34.44	20	06 x 051
8.3	5.2	8	5.5	1.2	16	16.900	3.10	52.39	20	08 x 016
8.3	5.2	8	5.5	1.2	25	8.450	5.50	46.48	20	08 x 025
8.3	5.2	8	5.5	1.2	38	5.200	8.40	43.68	20	08 x 038
8.3	5.2	8	5.5	1.2	51	3.755	11.60	43.56	20	08 x 051

Pressure spring, very heavy load (yellow) Order number **SZ 8114**.

x

$\varnothing D_h^{H15}$	$\varnothing D_{dh15}$	$\varnothing D_a$	$\varnothing D_i$	$\varnothing d$	L_0	c Spring rate (N/mm)	Long life time s_1 with 1 mm pre-load in mm	F_1 in N	Standard pack	
6.3	3.2	6	3.5	1.2	16	38.440	2.00	76.88	20	06 x 016
6.3	3.2	6	3.5	1.2	25	21.350	3.10	66.19	20	06 x 025
6.3	3.2	6	3.5	1.2	38	13.730	4.50	61.79	20	06 x 038
6.3	3.2	6	3.5	1.2	51	9.610	6.00	57.66	20	06 x 051
8.3	4.5	8	4.8	1.5	16	47.240	2.20	103.93	20	08 x 016
8.3	4.5	8	4.8	1.5	25	23.620	3.80	89.76	20	08 x 025
8.3	4.5	8	4.8	1.5	38	14.530	6.00	87.18	20	08 x 038
8.3	4.5	8	4.8	1.5	51	10.500	7.60	79.80	20	08 x 051

System spring units SZ 8565



System spring unit SZ 8565.00 complete, but without spring:

1 socket-head screw	SZ 8510
1 spacer pipe	SZ 8560
1 threaded disc	SZ 8566
1 adapting disc	SZ 8567
1 clamping disc	SZ 8568
1 regrinding disc	SZ 8569

System spring unit complete with spring:

SZ 8010	SZ 8565.10
SZ 8020	SZ 8565.20
SZ 8030	SZ 8565.30
SZ 8040	SZ 8565.40

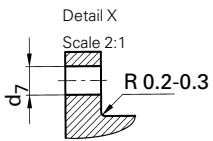
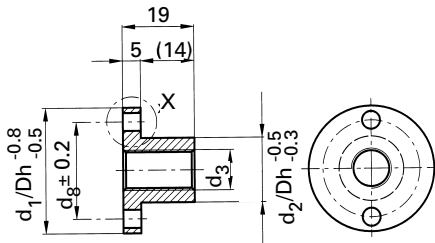
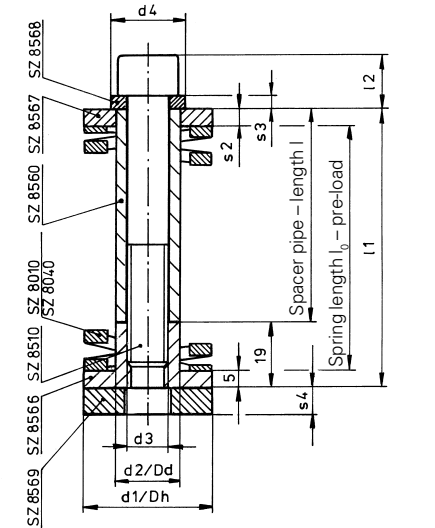
Add size to order number:

Sleeves $\emptyset d_1/D_h \times l_1$

Add size to order number

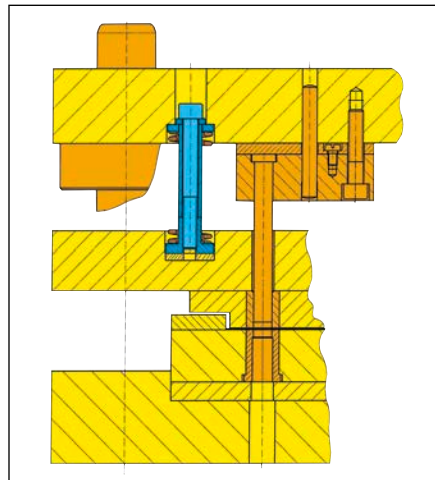
Order number SZ 8565.																
Sleeves		Pin		SZ 8510 in		SZ 8560 in		SZ 8566 in		SZ 8567 in		SZ 8568 in		matching		
\emptyset	\emptyset															
d_1/D_h	d_2/D_d	d_3	d_4	l	l_1	l_2	s_2	s_3	SZ 8565 included	SZ 8565 included	SZ 8565 included	SZ 8565 included	SZ 8565 included	SZ 8010-40		
20	10	M6	13	20	39	9	4	3	06 x 035	10 x 020	20	20	20	20 x 032		20 x 039
				30	49				06 x 045	10 x 030				20 x 044		20 x 049
				50	69				06 x 070	10 x 050				20 x 064		20 x 069
				63	82				06 x 080	10 x 063				20 x 076		20 x 082
25	12.5	M8	16	20	39	11	4	3	08 x 035	12 x 020	25	25	25	25 x 032		25 x 039
				30	49				08 x 045	12 x 030				25 x 044		25 x 049
				50	69				08 x 070	12 x 050				25 x 064		25 x 069
				63	82				08 x 080	12 x 063				25 x 076		25 x 082
				100	119				08 x 120	12 x 100				25 x 115		25 x 119
32	16	M10	19	30	49	13	4	3	10 x 050	16 x 030	32	32	32	32 x 044		32 x 049
				50	69				10 x 070	16 x 050				32 x 064		32 x 069
				63	82				10 x 080	16 x 063				32 x 076		32 x 082
				100	119				10 x 120	16 x 100				32 x 115		32 x 119
40	20	M12	23	50	69	16	5	4	12 x 070	20 x 050	40	40	40	40 x 064		40 x 069
				63	82				12 x 080	20 x 063				40 x 076		40 x 082
				100	119				12 x 120	20 x 100				40 x 115		40 x 119
50	25	M16	28	50	69	20	5	4	16 x 070	25 x 050	50	50	50	50 x 064		50 x 069
				63	82				16 x 080	25 x 063				50 x 076		50 x 082
				100	119				16 x 120	25 x 100				50 x 115		50 x 119

Force-path table																
Spring elements	With system springs		SZ 8010 green (light load)			SZ 8020 blue (medium load)			SZ 8030 red (heavy load)			SZ 8040 yellow (very heavy load)				
	SZ 8020	pre-load	pre-load	max. working	max. spring	pre-load	max. working	max. spring	pre-load	max. working	max. spring	pre-load	max. working	max. spring		
SZ 8565	SZ 8030	SZ 8040	mm	%	force (N)	path (N)	force (N)	path (N)	force (N)	path (N)	force (N)	path (N)	force (N)	path (N)		
20 x 039	20 x 032	2	6		90	10.8	576	145	9.2	813	336	7.6	1612	448	6	1792
20 x 049	20 x 044	4	9		120	13.6	528	190	11.4	731	448	9.2	1478	596	7	1639
20 x 069	20 x 064	4	6		80	21.6	512	129	18.4	723	288	15.2	1384	396	12	1584
20 x 082	20 x 076	3	4		48	27.4	486	75	23.6	667	179	19.8	1361	245	16	1552
25 x 039	25 x 032	2	6		160	10.8	1027	236	9.2	1321	594	7.6	2851	748	6	2995
25 x 049	25 x 044	4	9		211	13.6	931	323	11.4	1244	748	9.2	2468	976	7	2684
25 x 069	25 x 064	4	6		140	21.6	901	212	18.4	1187	492	15.2	2361	644	12	2576
25 x 082	25 x 076	3	4		84	27.4	851	129	23.6	1149	297	19.8	2257	392	16	2485
25 x 119	25 x 115	5	4		93	41.0	860	140	35.3	1128	325	29.5	2242	428	23.8	2468
32 x 049	32 x 044	4	9		318	13.6	1399	632	11.4	2433	1296	9.2	4276	1976	7	4668
32 x 069	32 x 064	4	6		212	21.6	1356	396	18.4	2217	848	15.2	4070	1076	12	4307
32 x 082	32 x 076	3	4		132	27.4	1337	241	23.6	2141	516	19.8	3921	655	16	4151
32 x 119	32 x 115	5	4		145	41.0	1334	257	35.3	2058	535	29.5	3691	700	23.8	4032
40 x 069	40 x 064	5	8		365	20.6	1868	700	17.4	3136	1345	14.2	5164	2435	11	7792
40 x 082	40 x 076	4	5		252	26.4	1915	432	22.6	2872	876	18.8	4993	1516	15	7201
40 x 119	40 x 115	6	5		237	40.0	1821	430	34.3	2893	852	28.5	4899	1470	22.8	7056
50 x 069	50 x 064	5	8		780	20.6	3993	1045	17.4	4681	2065	14.2	7929	3545	11	11344
50 x 082	50 x 076	4	5		500	26.4	3800	672	22.6	4468	1356	18.8	7729	2288	15	10868
50 x 119	50 x 115	6	5		486	40.0	3726	636	34.3	4271	1290	28.5	7417	2112	22.8	10137



Material: C45

SZ 8566



Order example: System spring unit complete, but without spring
SZ 8565.00

Sleeves $\varnothing d_1/D_h = 32$ mm
Installation length $l_1 = 82$ mm
Addition **32 x 082**
Order number **SZ 8565.00.32 x 082**

Order example: System spring unit, complete with spring, e.g. SZ 8040
SZ 8565.40

Sleeves $\varnothing d_1/D_h = 32$ mm
Installation length $l_1 = 82$ mm
Addition **32 x 082**
Order number **SZ 8565.40.32 x 082**

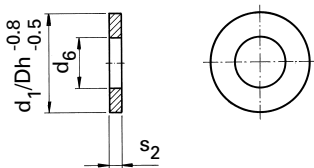
Order example for individual parts:

Threaded disc **SZ 8566**
Sleeves $\varnothing d_1/D_h = 32$ mm
Addition **32**
Order number **SZ 8566.32**

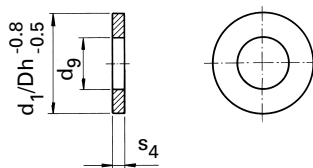
Matching this:

- Spacer pipe SZ 8560
- Socket-head screws SZ 8510
- System springs SZ 8010, SZ 8020, SZ 8030, SZ 8040

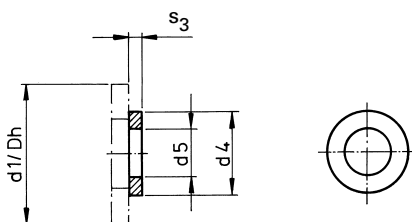
see respective catalogue page



SZ 8567



SZ 8569



SZ 8568

Add size to order number

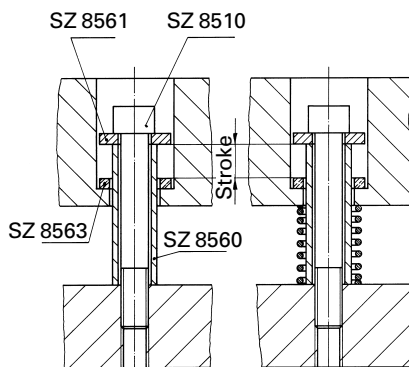
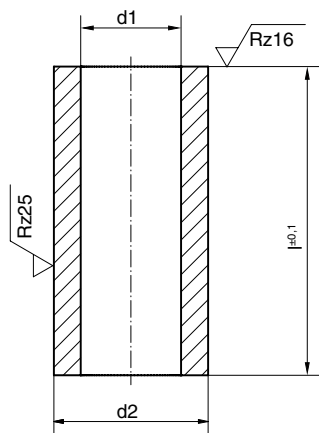
Individual parts for special lengths

Threaded disc	Order number SZ 8566.	<input type="text"/>
Adapting disc	Order number SZ 8567.	<input type="text"/>
Clamping disc	Order number SZ 8568.	<input type="text"/>
Regrinding disc	Order number SZ 8569.	<input type="text"/>

$d_1/D_h^{-0.8}_{-0.5}$	$d_2/Dd^{-0.5}_{-0.3}$	d_3	d_4	d_5	d_6	d_7	d_8	d_9	s_2	s_3	s_4	
20	10.0	M6	13	6.5	10.5	3.2	14	6.5	4	3	8	20
25	12.5	M8	16	8.5	13.0	4.2	18.5	8.5	4	3	8	25
32	16.0	M10	19	10.5	16.5	4.2	25	10.5	4	3	10	32
40	20.0	M12	23	12.5	20.5	4.2	30	12.5	5	4	10	40
50	25.0	M16	28	16.5	25.5	4.2	40	16.5	5	4	10	50

Spacer pipes

Add size to order number



Spacer pipes

Material:

1.0308 (St 35), hardened,
hardness 56–58 HRC

Order example: Spacer pipe SZ 8560

$d_2 = 16 \text{ mm}$, $l = 40 \text{ mm}$

Addition **16 x 040**

Order number **SZ 8560.16 x 040**

Special lengths upon request.

Minimum purchase quantity

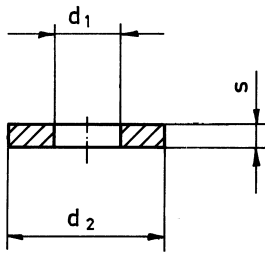
Ø10–Ø16 20 pieces

Ø19–Ø36 10 pieces

Order number **SZ 8560.**

x

d_1	d_2	$r^{0.1}$	matching this SZ 8561	matching this SZ 8563	
7	10	20	6.4	11	10 x 020
		30			10 x 030
		40			10 x 040
		50			10 x 050
		63			10 x 063
		80			10 x 080
9	12.5	20	8.4	14	12 x 020
		30			12 x 030
		40			12 x 040
		50			12 x 050
		63			12 x 063
		80			12 x 080
9	13	20	8.4	14	13 x 020
		30			13 x 030
		40			13 x 040
		50			13 x 050
		63			13 x 063
		80			13 x 080
11	16	30	10.5	17	16 x 030
		40			16 x 040
		50			16 x 050
		60			16 x 060
		63			16 x 063
		80			16 x 080
13	19	30	13	21	19 x 030
		40			19 x 040
		50			19 x 050
		60			19 x 060
		63			19 x 063
		80			19 x 080
13	20	30	13	21	20 x 030
		40			20 x 040
		50			20 x 050
		60			20 x 060
		63			20 x 063
		80			20 x 080
13	20	100	13	21	20 x 100
		125			20 x 125
		200			20 x 200
		30			25 x 050
		60			25 x 060
		63			25 x 063
17	25	70	17	26	25 x 070
		80			25 x 080
		90			25 x 090
		100			25 x 100
		125			25 x 125
		200			25 x 200
22	30	70	21	31	30 x 070
		80			30 x 080
		90			30 x 090
		100			30 x 100
		120			30 x 120
		125			30 x 125
26	36	150	25	37	36 x 150
		200			36 x 200
		80			36 x 080
		100			36 x 100
		125			36 x 125
		150			36 x 150
26	36	200	25	37	36 x 200
		200			36 x 200



Discs

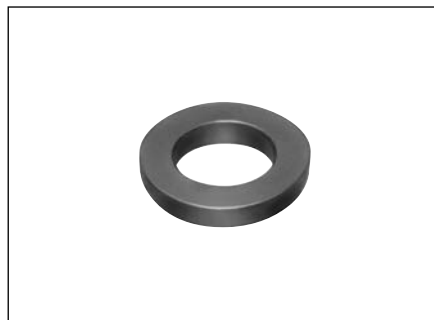
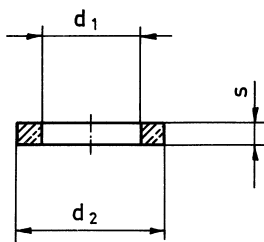
Material:
1.0503 (C 45),
hardness 45–64 HRC

Order example: Disc **SZ 8561**
 $d_1 = 10.5$ mm
Addition **10.5**
Order number **SZ 8561.10.5**

Add size to
order number

Order number **SZ 8561.**

d_1	d_2	s	
6.4	17	3	6.4
8.4	23	4	8.4
10.5	26	4	10.5
13	30	5	13
17	35	6	17
21	42	8	21
25	46	10	25



Damping discs

Material:
Vulkollan,
Polyurethane elastomer (PUR)
on the basis of Desmodur 15,
hardness 90 ± 5 Shore A

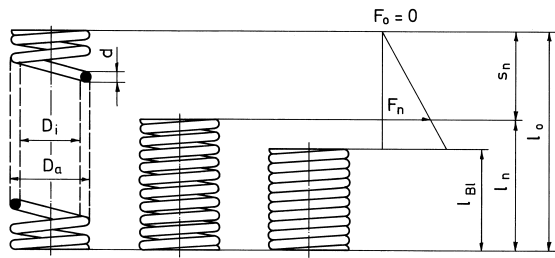
Order example: Damping plate **SZ 8563**
 $d_1 = 17$ mm
Addition **17**
Order number **SZ 8563.17**

Add size to
order number

Order number **SZ 8563.**

d_1	d_2	s	
11	17	3	11
14	23	4	14
17	26	4	17
21	30	5	21
26	35	6	26
31	42	6	31
37	46	6	37

Helical springs SZ 8100



Helical springs with round wire cross-section

Material:

Patented cold-drawn steel wire, class C in accordance with DIN 17223

Quality grade 2 in accordance with DIN 2095. The springs are set, closed at both ends per 1 winding and ground.

Springs with round wire cross-sections should be preferred, because they have the most positive attributes.

Order example: Helical spring with round wire cross-section **SZ 8100**

$D_a = 46 \text{ mm}$, $l_0 = 67 \text{ mm}$

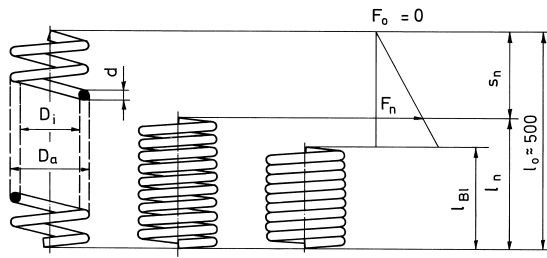
Addition **46 x 67**

Order number **SZ 8100.46 x 67**

Add size to order number

Order number SZ 8100.										<input type="text"/> x <input type="text"/>	
D_a	D_i	d	l_0	l_n	s_n	Spring force $F_n^*)$ (N) $\pm 10 \%$	l_{BI}	Standard pack			
10	7	1.5	40	23.9	16.1	130	18	50	10	x 40	
12	9	1.5	55	25.3	29.7	110	23	50	12	x 55	
14	10	2	40	22.4	17.6	210	20.5	50	14	x 40	
14	10	2	50	25	25	250	24	50	14	x 50	
15	11	2	40	20	20	220	17.5	50	15	x 40	
17	12.5	2.25	85	41	44	260	35	30	17	x 85	
17.5	11.5	3	45	31	14	490	29	30	17.5	x 45	
17.5	11.5	3	50	34	16	480	33	30	17.5	x 50	
18	10	4	83	65	18	1330	61.5	20	18	x 83	
19	11	4	35	27	8	1340	26	30	19	x 35	
19	10	4.5	90	72.4	17.6	1690	70.5	20	19	x 90	
19.5	14.5	2.5	35	20	15	200	18.5	30	19.5	x 35	
19.5	13.5	3	40	26	14	450	24.5	30	19.5	x 40	
20.5	15.5	2.5	95	46.2	48.8	200	37	20	20.5	x 95	
21	13	4	40	29	11	1140	28	20	21	x 40	
21.5	15.5	3	45	23.6	21.4	540	22.5	20	21.5	x 45	
21.5	13.5	4	50	34.4	15.6	1140	32	20	21.5	x 50	
25	17	4	24	16.8	7.2	950	15.5	30	25	x 24	
27.8	13.8	7	70	59	11	3680	57	10	27.8	x 70	
30	22	4	70	36	34	810	34	20	30	x 70	
30	17	6.5	150	122	28	2850	108	10	30	x 150	
32	20	6	125	93	32	2110	84	10	32	x 125	
42	26	8	130	94	36	3830	82	6	42	x 130	
42	26	8	200	137.7	62.3	3830	125	6	42	x 200	
46	26	10	67	58	9	5640	53	6	46	x 67	
47	30	8.5	50	39	11	3630	36	10	47	x 50	
53	31	11	200	157	43	6620	145	4	53	x 200	
56	40	8	50	36	14	2080	34	10	56	x 50	
61	39	11	180	137	43	5100	124	4	61	x 180	
84	64	10	200	110	90	3750	75	2	84	x 200	

*) Helical springs arranged according to forces, see relevant page

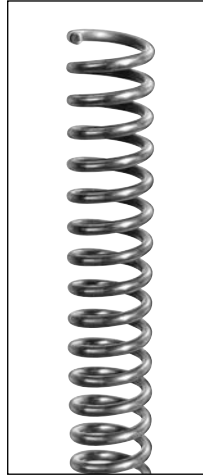


Order example: Helical spring with round wire cross-section, 500 mm long **SZ 8101**

$D_a = 18$ mm, $d = 4$ mm

Addition **18 x 4**

Order number **SZ 8101.18 x 4**



Helical springs with round wire cross-section, 500 mm long

Material:

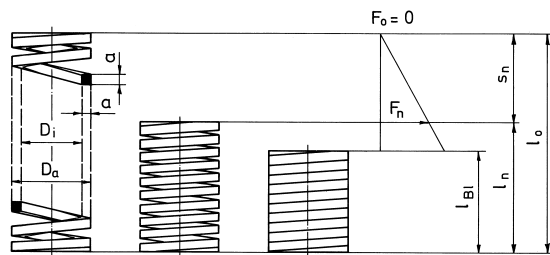
Patented cold-drawn steel wire, class C in accordance with DIN 17223

Quality grade 2 in accordance with DIN 2095. The springs are set.

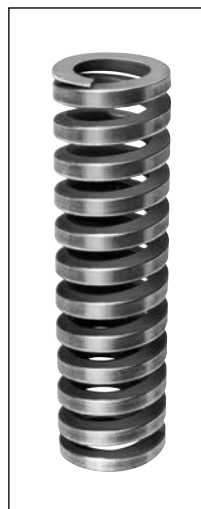
500 mm long helical springs are suitable for the manufacture of any spring lengths. After cutting off the desired length, close the spring ends and grind at a right angle to the spring axle. Avoid excessive heating during closing!

Add size to order number

Order number SZ 8101.							x
D_a	D_i	d	l_n	s_n	Spring force F_n (N)	Standard pack	
10	7	1.5	300	200	130	5	10 x 1.5
12	9	1.5	230	270	110	5	12 x 1.5
14	10	2	280	220	210	5	14 x 2
15	11	2	250	250	220	5	15 x 2
17	12.5	2.25	240	260	260	3	17 x 2.25
17.5	11.5	3	344	156	490	3	17.5 x 3
18	10	4	392	108	1330	3	18 x 4
19	10	4.5	400	100	1690	3	19 x 4.5
19.5	14.5	2.5	286	214	200	3	19.5 x 2.5
19.5	13.5	3	325	175	450	3	19.5 x 3
20.5	15.5	2.5	243	257	200	3	20.5 x 2.5
21	13	4	363	137	1140	3	21 x 4
21.5	15.5	3	262	238	540	3	21.5 x 3
21.5	13.5	4	344	156	1140	3	21.5 x 4
25	17	4	350	150	950	3	25 x 4
27.8	13.8	7	420	80	3680	3	27.8 x 7
30	22	4	257	243	810	3	30 x 4
30	17	6.5	407	93	2850	3	30 x 6.5
32	20	6	372	128	2110	3	32 x 6
42	26	8	362	138	3830	1	42 x 8
46	26	10	433	67	5640	1	46 x 10
47	30	8.5	390	110	3630	1	47 x 8.5
53	31	11	393	107	6620	1	53 x 11
56	40	8	360	140	2080	1	56 x 8
61	39	11	380	120	5100	1	61 x 11



Order example: Helical spring with square wire cross-section **SZ 8200**
 $D_a = 19.5$ mm, $l_0 = 45$ mm
 Addition **19.5 x 45**
 Order number **SZ 8200.19.5 x 45**



Helical springs with square wire cross-section

Material:
 Patented cold-drawn steel wire, class C in accordance with DIN 17223

Tolerances similar DIN 2095 The springs are set, closed at both ends per 1 winding and ground.

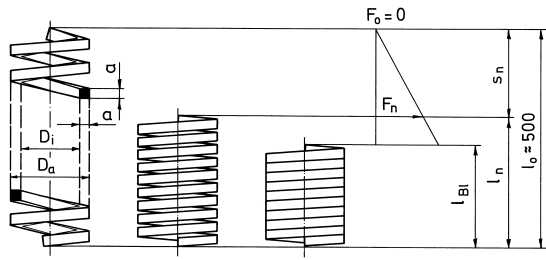
The spring force of springs with a square cross-section is higher than that of comparable springs with a round wire cross-section. However, the life time is somewhat shorter as a result of the unfavourable stress distribution in the wire cross-section.

Add size to order number

Order number SZ 8200.										<input type="text"/> x <input type="text"/>
D_a	D_i	$a \times a$	l_0	l_n	s_n	Spring force $F_n^*)$ (N) $\pm 10\%$	$l_{Bl.}$	Standard pack		
10	7	1.5	20	12.6	7.4	170	11.5	50	10	x 20
11.5	7.5	2	20	14.2	5.8	290	13.5	50	11.5	x 20
12	9	1.5	50	23.2	26.8	130	22	30	12	x 50
12.5	7.5	2.5	25	21	4	450	19	40	12.5	x 25
14	9	2.5	50	37.5	12.5	420	33	30	14	x 50
14.5	9.5	2.5	32	21.6	10.4	510	20	30	14.5	x 32
17.5	9.5	4	45	37.8	7.2	1570	35.5	30	17.5	x 45
19	11	4	50	39.4	10.6	1720	36.5	20	19	x 50
19.5	11.5	4	45	35.2	9.8	1570	32.5	20	19.5	x 45
21	13	4	45	34	11	1280	32	20	21	x 45
23	15	4	83	58.4	24.6	1100	55	10	23	x 83
26	14	6	45	40.2	4.8	2950	37	10	26	x 45
28	14	7	98	83.5	14.5	7200	82	6	28	x 98
30	21	4.5	50	32.5	17.5	1240	30.5	10	30	x 50
36	26	5	50	31	19	1340	29	10	36	x 50
42	26	8	72	55.5	16.5	4610	53	4	42	x 72
60	40	10	120	91	29	5010	84	2	60	x 120
70	54	8	60	39	21	1790	36	4	70	x 60

*) Helical springs arranged according to forces, see relevant page

Helical springs SZ 8201



Order example: Helical spring with square wire cross-section 500 mm long **SZ 8201**
 $D_a = 19$ mm, $a = 4$ mm
 Addition **19 x 4**
 Order number **SZ 8201.19 x 4**



Helical springs with square wire cross-section, 500 mm long

Material:
 Patented cold-drawn steel wire, class C in accordance with DIN 17223

Tolerances similar DIN 2095.
 The springs are set.

The spring force of springs with a square cross-section is higher than that of comparable springs with a round wire cross-section. However, the life time is somewhat shorter as a result of the unfavourable stress distribution in the wire cross-section.

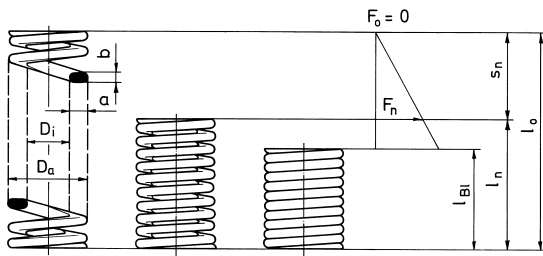
500 mm long helical springs are suitable for the manufacture of any spring lengths. After cutting off the desired length, close the spring ends and grind at a right angle to the spring axle. Avoid excessive heating during closing!

Add size to order number

Order number **SZ 8201.**

x

D_a	D_i	$a \times a$	l_n	s_n	Spring force F_n (N)	Standard pack	
10	7	1.5	315	185	170	5	10 x 1.5
11.5	7.5	2	355	145	290	5	11.5 x 2
12	9	1.5	232	268	130	5	12 x 1.5
12.5	7.5	2.5	420	80	450	5	12.5 x 2.5
14.5	9.5	2.5	338	162	510	5	14.5 x 2.5
19	11	4	394	106	1720	3	19 x 4
21	13	4	378	122	1280	3	21 x 4
23	15	4	352	148	1100	3	23 x 4
28	14	7	426	74	6400	3	28 x 7
30	21	4.5	325	175	1240	3	30 x 4.5
36	26	5	310	190	1340	3	36 x 5
42	26	8	385	115	4610	1	42 x 8
60	40	10	380	120	5010	1	60 x 10
70	54	8	325	175	1790	1	70 x 8

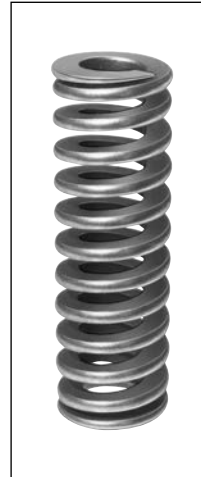


Order example: Helical spring with oval wire cross-section **SZ 8400**

$D_a = 32 \text{ mm}$, $l_0 = 69 \text{ mm}$

Addition **32 x 69**

Order number **SZ 8400.32 x 69**



Helical compression spring with oval wire cross-section

Material:

Patented cold-drawn steel wire, class C in accordance with DIN 17223

Tolerances similar DIN 2095 The springs are set, closed at both ends per 1 winding and ground.

Special treatment: Shot-blasted

Note:

For long life time with oscillating load $s_{\text{max}} = \text{ca. } 0.7 s_n$.

The spring force of springs with an oval cross-section is higher than that of comparable springs with a round wire cross-section. However, the life time is somewhat shorter as a result of the unfavourable stress distribution in the wire cross-section.

Add size to order number

Order number **SZ 8400.**

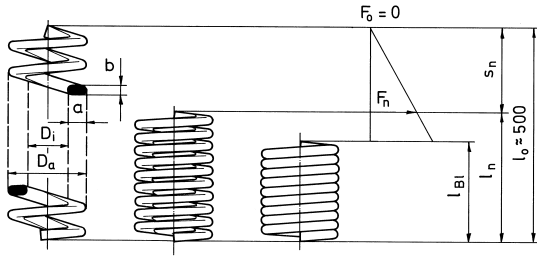
x

D_a	D_i	$a \times b$	l_0	l_n	s_n	Spring force $F_n^*)$ (N) $\pm 10 \%$	l_{BI}	Standard pack	
11	7	2 x 1.25	20	10	10	200	9.5	50	11 x 20
12.5	7.5	2.5 x 1.5	20	13	7	270	12	50	12.5 x 20
13	9	2 x 1.25	50	20	30	150	18.5	50	13 x 50
14	8	3 x 1.6	25	15	10	400	13.5	50	14 x 25
15.5*	8.5	3.5 x 2.2	25	17	8	740	15.5	40	15.5 x 25
17	9	4 x 2	50	32	18	690	30	30	17 x 50
17.6	9.6	4 x 2	30	18	12	690	17.5	40	17.6 x 30
25	13	6 x 3	54	35	19	1180	32	20	25 x 54
25	13	6 x 3	65	42	23	1180	36	10	25 x 65
25	13	6 x 3	77	50	27	1180	44	10	25 x 77
25	13	6 x 3	99	64	35	1180	52	10	25 x 99
25	13	6 x 3	123	79	44	1180	68	10	25 x 123
32	17	7.5 x 4	69	45	24	2020	43	10	32 x 69
32	17	7.5 x 4	84	55	29	2020	50	10	32 x 84
32	17	7.5 x 4	98	64	34	2020	60	10	32 x 98
32	17	7.5 x 4	127	83	44	2020	74	10	32 x 127
38	21	8.5 x 5	67	45	22	2950	44	10	38 x 67
38	21	8.5 x 5	85	57	28	2950	50	6	38 x 85
38	21	8.5 x 5	102	68	34	2950	64	6	38 x 102
38	21	8.5 x 5	120	80	40	2950	70	6	38 x 120
38	21	8.5 x 5	147	97	50	2950	88	4	38 x 147
50	28	11 x 6	100	72	28	3440	60	4	50 x 100
50	28	11 x 6	150	105	45	3440	87	4	50 x 150
50	28	11 x 6	193	135	58	3440	118	2	50 x 193

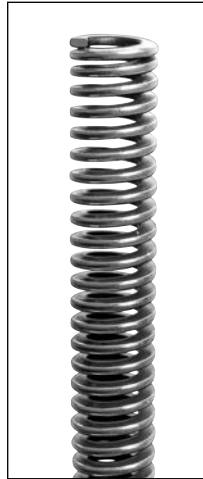
*) Helical springs arranged according to forces, see relevant page

* Helical compression spring with trapezoidal wire cross-section

Helical springs SZ 8401



Order example: Helical spring with oval wire cross-section, 500 mm long **SZ 8401**
 $D_a = 32$ mm, $a = 7.5$ mm, $b = 4$ mm
 Addition **32 x 7.5 x 4**
 Order number **SZ 8401.32 x 7.5 x 4**



Helical springs with oval wire cross-section, 500 mm long

Material:
 Patented cold-drawn steel wire, class C in accordance with DIN 17223

Tolerances similar DIN 2095.
 The springs are set.
 Special treatment: Shot-blasted

Note:
 For long life time with oscillating load $s_{max} = ca. 0.7 s_n$.

The spring force of springs with an oval cross-section is higher than that of comparable springs with a round wire cross-section. However, the life time is somewhat shorter as a result of the unfavourable stress distribution in the wire cross-section.

500 mm long helical springs are suitable for the manufacture of any spring lengths. After cutting off the desired length, close the spring ends and grind at a right angle to the spring axle. Avoid excessive heating during closing!

Add size to order number

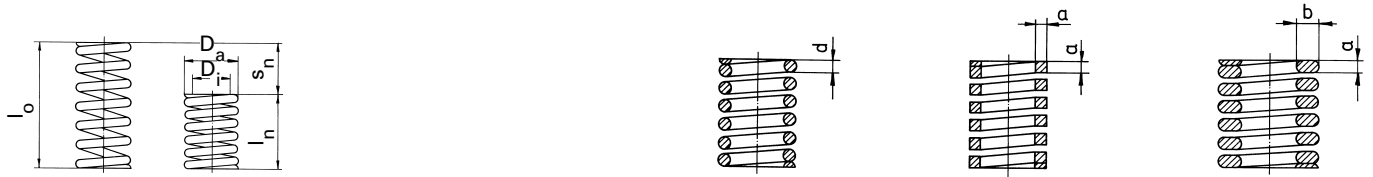
Order number **SZ 8401.** x x

D_a	D_i	$a \times b$	l_n	s_n	Spring force F_n (N)	Standard pack	
11	7	2 x 1.25	250	250	200	5	11 x 2 x 1.25
13	9	2 x 1.25	200	300	150	5	13 x 2 x 1.25
14	8	3 x 1.6	300	200	400	5	14 x 3 x 1.6
15.5	8.5	3.5 x 2.2	340	160	740	3	15.5 x 3.5 x 2.2
17	9	4 x 2	320	180	690	3	17 x 4 x 2
25	13	6 x 3	324	176	1180	3	25 x 6 x 3
32	17	7.5 x 4	326	174	2020	3	32 x 7.5 x 4
38	21	8.5 x 5	333	167	2950	3	38 x 8.5 x 5
50	28	11 x 6	350	150	3440	1	50 x 11 x 6

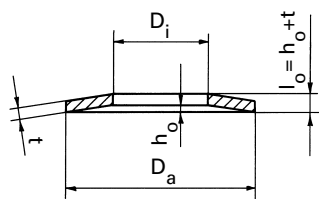
Helical springs SZ 8100, SZ 8200, SZ 8400

STEINEL®

arranged according to forces



Order number	SZ 8100. <input type="checkbox"/> x <input type="checkbox"/>						SZ 8200. <input type="checkbox"/> x <input type="checkbox"/>			SZ 8400. <input type="checkbox"/> x <input type="checkbox"/>		
Spring force Fn (N)	D _a	D _i	l ₀	l _n	s _n	d	a x a		a x b			
110	12	9	55	25.3	29.7	1.5	12 x 55	-	-	-	-	
130	10	7	40	23.9	16.1	1.5	10 x 40	-	-	-	-	
130	12	9	50	23.2	26.8	-	-	1.5 x 1.5	12 x 50	-	-	
150	13	9	50	20	30	-	-	-	-	2 x 1.25	13 x 50	
170	10	7	20	12.6	7.4	-	-	1.5 x 1.5	10 x 20	-	-	
200	11	7	20	10	10	-	-	-	-	2 x 1.25	11 x 20	
200	19.5	14.5	35	20	15	2.5	19.5 x 35	-	-	-	-	
200	20.5	15.5	95	46.2	48.8	2.5	20.5 x 95	-	-	-	-	
210	14	10	40	22.4	17.6	2	14 x 40	-	-	-	-	
220	15	11	40	20	20	2	15 x 40	-	-	-	-	
250	14	10	50	25	25	2	14 x 50	-	-	-	-	
260	17	12.5	85	41	44	2.25	17 x 85	-	-	-	-	
270	12.5	7.5	20	13	7	-	-	-	-	2.5 x 1.5	12.5 x 20	
290	11.5	7.5	20	14.2	5.8	-	-	2 x 2	11.5 x 20	-	-	
400	14	8	25	15	10	-	-	-	-	3 x 1.6	14 x 25	
420	14	9	50	37.5	12.5	-	-	2.5 x 2.5	14 x 50	-	-	
450	12.5	7.5	25	21	4	-	-	2.5 x 2.5	12.5 x 25	-	-	
450	19.5	13.5	40	26	14	3	19.5 x 40	-	-	-	-	
480	17.5	11.5	50	34	16	3	17.5 x 50	-	-	-	-	
490	17.5	11.5	45	31	14	3	17.5 x 45	-	-	-	-	
510	14.5	9.5	32	21.6	10.4	-	-	2.5 x 2.5	14.5 x 32	-	-	
540	21.5	15.5	45	23.6	21.4	3	21.5 x 45	-	-	-	-	
690	17	9	50	32	18	-	-	-	-	4 x 2	17 x 50	
690	17.6	9.6	30	18	12	-	-	-	-	4 x 2	17.6 x 30	
740	15.5	8.5	25	17	8	-	-	-	-	3.5 x 2.2	15.5 x 25	
810	30	22	70	36	34	4	30 x 70	-	-	-	-	
950	25	17	24	16.8	7.2	4	25 x 24	-	-	-	-	
1100	23	15	83	58.4	24.6	-	-	4 x 4	23 x 83	-	-	
1140	21	13	40	29	11	4	21 x 40	-	-	-	-	
1140	21.5	13.5	50	34.4	15.6	4	21.5 x 50	-	-	-	-	
1180	25	13	54	35	19	-	-	-	-	6 x 3	25 x 54	
1180	25	13	65	42	23	-	-	-	-	6 x 3	25 x 65	
1180	25	13	77	50	27	-	-	-	-	6 x 3	25 x 77	
1180	25	13	99	64	35	-	-	-	-	6 x 3	25 x 99	
1180	25	13	123	79	44	-	-	-	-	6 x 3	25 x 123	
1240	30	21	50	32.5	17.5	-	-	4.5 x 4.5	30 x 50	-	-	
1280	21	13	45	34	11	-	-	4 x 4	21 x 45	-	-	
1330	18	10	83	65	18	4	18 x 83	-	-	-	-	
1340	19	11	35	27	8	4	19 x 35	-	-	-	-	
1340	36	26	50	31	19	-	-	5 x 5	36 x 50	-	-	
1570	17.5	9.5	45	37.8	7.2	-	-	4 x 4	17.5 x 45	-	-	
1570	19.5	11.5	45	35.2	9.8	-	-	4 x 4	19.5 x 45	-	-	
1690	19	10	90	72.4	17.6	4.5	19 x 90	-	-	-	-	
1720	19	11	50	39.4	10.6	-	-	4 x 4	19 x 50	-	-	
1790	70	54	60	39	21	-	-	8 x 8	70 x 60	-	-	
2020	32	17	69	45	24	-	-	-	-	7.5 x 4	32 x 69	
2020	32	17	84	55	29	-	-	-	-	7.5 x 4	32 x 84	
2020	32	17	98	64	34	-	-	-	-	7.5 x 4	32 x 98	
2020	32	17	127	83	44	-	-	-	-	7.5 x 4	32 x 127	
2080	56	40	50	36	14	8	56 x 50	-	-	-	-	
2110	32	20	125	93	32	6	32 x 125	-	-	-	-	
2850	30	17	150	122	28	6.5	30 x 150	-	-	-	-	
2950	26	14	45	40.2	4.8	-	-	6 x 6	26 x 45	-	-	
2950	38	21	67	45	22	-	-	-	-	8.5 x 5	38 x 67	
2950	38	21	85	57	28	-	-	-	-	8.5 x 5	38 x 85	
2950	38	21	102	68	34	-	-	-	-	8.5 x 5	38 x 102	
2950	38	21	120	80	40	-	-	-	-	8.5 x 5	38 x 120	
2950	38	21	147	97	50	-	-	-	-	8.5 x 5	38 x 147	
3440	50	28	100	72	28	-	-	-	-	11 x 6	50 x 100	
3440	50	28	150	105	45	-	-	-	-	11 x 6	50 x 150	
3440	50	28	193	135	58	-	-	-	-	11 x 6	50 x 193	
3440	50	28	230	160	70	-	-	-	-	11 x 6	50 x 230	
3630	47	30	50	39	11	8.5	47 x 50	-	-	-	-	
3680	27.8	13.8	70	59	11	7	27.8 x 70	-	-	-	-	
3750	84	64	200	110	90	10	84 x 200	-	-	-	-	
3830	42	26	130	94	36	8	42 x 130	-	-	-	-	
3830	42	26	200	137.7	62.3	8	42 x 200	-	-	-	-	
4610	42	26	72	55.5	16.5	-	-	8 x 8	42 x 72	-	-	
5010	60	40	120	91	29	-	-	10 x 10	60 x 120	-	-	
5100	61	39	180	137	43	11	61 x 180	-	-	-	-	
5300	28	14	98	83.5	14.5	-	-	7 x 7	28 x 98	-	-	
5640	46	26	67	58	9	10	46 x 67	-	-	-	-	
6620	53	31	200	157	43	11	53 x 200	-	-	-	-	



DIN 2093, series A and B

Sizes in brackets are not in accordance with DIN

Explanation:

F = Spring force (N)
s = Stroke (mm)

Order example: Disc spring SZ 8300

$D_a = 25 \text{ mm}$, $D_i = 12.2 \text{ mm}$, $t = 1.5 \text{ mm}$

Addition **25 x 12.2 x 1.5**

Order number **SZ 8300.25 x 12.2 x 1.5**

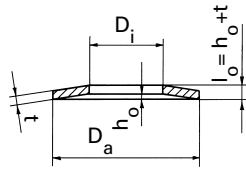
Add size to
order number

Order number SZ 8300.														<input type="text"/>	x	<input type="text"/>	x	<input type="text"/>
D_a	D_i	t	h_o	l_o	s = 0.2 h_o		s = 0.4 h_o		s = 0.6 h_o		s = 0.75 h_o		Standard pack					
					F*)	s	F*)	s	F*)	s	F*)	s						
8.0	4.2	0.3	0.25	0.55	42.5	0.05	75.6	0.10	102	0.15	119	0.19	100	08 x 4.2 x 0.3				
8.0	4.2	0.4	0.2	0.6	63.5	0.04	120	0.08	173	0.12	210	0.15	100	08 x 4.2 x 0.4				
10.0	5.2	0.4	0.3	0.7	72.1	0.06	130	0.12	178	0.18	213	0.23	100	10 x 5.2 x 0.4				
10.0	5.2	0.5	0.25	0.75	98.5	0.05	187	0.10	268	0.15	329	0.19	100	10 x 5.2 x 0.5				
12.5	6.2	0.5	0.35	0.85	98.3	0.07	180	0.14	248	0.21	291	0.26	100	12.5 x 6.2 x 0.5				
12.5	6.2	0.7	0.3	1.0	194	0.06	372	0.12	539	0.18	673	0.23	100	12.5 x 6.2 x 0.7				
14.0	7.2	0.5	0.4	0.9	98.9	0.08	177	0.16	239	0.24	279	0.30	100	14 x 7.2 x 0.5				
14.0	7.2	0.8	0.3	1.1	229	0.06	444	0.12	648	0.18	813	0.23	100	14 x 7.2 x 0.8				
15.0	5.2	0.7	0.4	1.1	174	0.08	326	0.16	461	0.24	555	0.30	100	(15) x 5.2 x (0.7)				
16.0	8.2	0.6	0.45	1.05	141	0.09	255	0.18	349	0.27	412	0.34	100	16 x 8.2 x 0.6				
16.0	8.2	0.9	0.35	1.25	293	0.07	566	0.14	825	0.21	1000	0.26	100	16 x 8.2 x 0.9				
18.0	9.2	0.7	0.5	1.2	191	0.10	348	0.20	480	0.30	572	0.38	100	18 x 9.2 x 0.7				
18.0	9.2	1.0	0.4	1.4	364	0.08	703	0.16	1020	0.24	1250	0.30	100	18 x 9.2 x 1.0				
20.0	10.2	0.8	0.55	1.35	249	0.11	456	0.22	631	0.33	745	0.41	100	20 x 10.2 x 0.8				
20.0	10.2	0.9	0.55	1.45	336	0.11	624	0.22	877	0.33	1040	0.41	100	(20) x 10.2 x (0.9)				
20.0	10.2	1.1	0.45	1.55	443	0.09	854	0.18	1240	0.27	1530	0.34	100	20 x 10.2 x 1.1				
22.5	11.2	0.8	0.65	1.45	252	0.13	450	0.26	608	0.39	710	0.49	100	22.5 x 11.2 x 0.8				
22.5	11.2	1.25	0.5	1.75	560	0.10	1080	0.20	1570	0.30	1950	0.38	100	22.5 x 11.2 x 1.25				
23.0	12.2	1.25	0.6	1.85	700	0.12	1330	0.24	1920	0.36	2330	0.45	100	(23) x 12.2 x (1.25)				
25.0	12.2	0.9	0.7	1.6	302	0.14	542	0.28	737	0.42	868	0.53	100	25 x 12.2 x 0.9				
25.0	12.2	1.5	0.55	2.05	838	0.11	1630	0.22	2380	0.33	2910	0.41	100	25 x 12.2 x 1.5				
28.0	14.2	1.0	0.8	1.8	392	0.16	702	0.32	949	0.48	1110	0.60	100	28 x 14.2 x 1.0				
28.0	14.2	1.5	0.65	2.15	836	0.13	1600	0.26	2320	0.39	2850	0.49	100	28 x 14.2 x 1.5				
31.5	16.3	1.25	0.9	2.15	648	0.18	1180	0.36	1620	0.54	1920	0.68	100	31.5 x 16.3 x 1.25				
31.5	16.3	1.75	0.7	2.45	1120	0.14	2170	0.28	3160	0.42	3900	0.53	100	31.5 x 16.3 x 1.75				
35.5	18.3	1.25	1.0	2.25	602	0.20	1080	0.40	1460	0.60	1700	0.75	50	35.5 x 18.3 x 1.25				
35.5	18.3	2.0	0.8	2.8	1500	0.16	2910	0.32	4230	0.48	5190	0.60	50	35.5 x 18.3 x 2.0				
40.0	20.4	1.5	1.15	2.65	911	0.23	1640	0.46	2240	0.69	2620	0.86	50	40 x 20.4 x 1.5				
40.0	20.4	2.25	0.9	3.15	1890	0.18	3640	0.36	5300	0.54	6540	0.68	50	40 x 20.4 x 2.25				
45.0	22.4	1.75	1.3	3.05	1250	0.26	2260	0.52	3100	0.78	3660	0.98	50	45 x 22.4 x 1.75				
45.0	22.4	2.5	1.0	3.5	2240	0.20	4320	0.40	6290	0.60	7720	0.75	50	45 x 22.4 x 2.5				
50.0	25.4	2.0	1.4	3.4	1600	0.28	2910	0.56	4020	0.84	4760	1.05	50	50 x 25.4 x 2.0				
50.0	25.4	2.5	1.4	3.9	2820	0.28	5300	0.56	7520	0.84	9060	1.05	50	(50) x 25.4 x (2.5)				
50.0	25.4	3.0	1.1	4.1	3430	0.22	6660	0.44	9740	0.66	12000	0.83	50	50 x 25.4 x 3.0				
56.0	28.5	2.0	1.6	3.6	1570	0.32	2810	0.64	3810	0.96	4440	1.20	50	56 x 28.5 x 2.0				
56.0	28.5	3.0	1.3	4.3	3350	0.26	6430	0.52	9320	0.78	11400	0.98	50	56 x 28.5 x 3.0				
63.0	31	2.5	1.75	4.25	2410	0.35	4400	0.70	6080	1.05	7180	1.31	50	63 x 31 x 2.5				
63.0	31	3.5	1.4	4.9	4360	0.28	8420	0.56	12300	0.84	15000	1.05	50	63 x 31 x 3.5				

*) Disc springs arranged according to forces, see relevant page
Sizes in brackets are not in accordance with DIN.

Disc springs SZ 8300

arranged according to forces



Explanation:

F = Spring force (N) of a disc spring or a group with $s = 0.75 h_0$

The named force at two or threefold coating arrangement is the theoretically calculated value. The actual values deviate from this due to friction losses.

s = Stroke of a single disc or a group ($0.75 h_0$)

l_{01} = Height of a single disc ($h_0 + t$)

l_{02} = Height of a disc set with twofold coating arrangement ($h_0 + 2 \cdot t$)

l_{03} = Height of a disc set with threefold coating arrangement ($h_0 + 3 \cdot t$)



Add size to order number

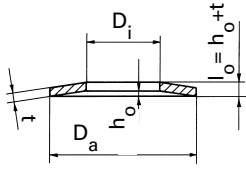
Order number **SZ 8300**.

x x

Spring force F _n (N)	s = 0.75 h ₀	D _a	D _i	t	l ₀₁	D _a	D _i	t	l ₀₂	D _a	D _i	t	l ₀₃	
119	0.19	8	4.2	0.3	0.55									08 x 4.2 x 0.3
210	0.15	8	4.2	0.4	0.6									08 x 4.2 x 0.4
213	0.23	10	5.2	0.4	0.7									10 x 5.2 x 0.4
238	0.19					8	4.2	0.3	0.85					08 x 4.2 x 0.3
279	0.30	14	7.2	0.5	0.9									14 x 7.2 x 0.5
291	0.26	12.5	6.2	0.5	0.85									12.5 x 6.2 x 0.5
329	0.19	10	5.2	0.5	0.75									10 x 5.2 x 0.5
357	0.19									8	4.2	0.3	1.15	08 x 4.2 x 0.3
412	0.34	16	8.2	0.6	1.05									16 x 8.2 x 0.6
420	0.15					8	4.2	0.4	1					08 x 4.2 x 0.4
426	0.23					10	5.2	0.4	1.1					10 x 5.2 x 0.4
555	0.30	15	5.2	0.7	1.1									15 x 5.2 x 0.7
558	0.30					14	7.2	0.5	1.4					14 x 7.2 x 0.5
572	0.38	18	9.2	0.7	1.2									18 x 9.2 x 0.7
582	0.26					12.5	6.2	0.5	1.35					12.5 x 6.2 x 0.5
630	0.15									8	4.2	0.4	1.4	08 x 4.2 x 0.4
639	0.23									10	5.2	0.4	1.5	10 x 5.2 x 0.4
658	0.19					10	5.2	0.5	1.25					10 x 5.2 x 0.5
673	0.23	12.5	6.2	0.7	1.0									12.5 x 6.2 x 0.7
710	0.49	22.5	11.2	0.8	1.45									22.5 x 11.2 x 0.8
745	0.41	20	10.2	0.8	1.35									20 x 10.2 x 0.8
813	0.23	14	7.2	0.8	1.1									14 x 7.2 x 0.8
824	0.34					16	8.2	0.6	1.65					16 x 8.2 x 0.6
837	0.30									14	7.2	0.5	1.9	14 x 7.2 x 0.5
868	0.53	25	12.2	0.9	1.6									25 x 12.2 x 0.9
873	0.26									12.5	6.2	0.5	1.85	12.5 x 6.2 x 0.5
987	0.19									10	5.2	0.5	1.75	10 x 5.2 x 0.5
1000	0.26	16	8.2	0.9	1.25									16 x 8.2 x 0.9
1040	0.41	20	10.2	0.9	1.45									20 x 10.2 x 0.9
1110	0.30					15	5.2	0.7	1.8					15 x 5.2 x 0.7
1110	0.60	28	14.2	1.0	1.8									28 x 14.2 x 1.0
1144	0.38					18	9.2	0.7	1.9					18 x 9.2 x 0.7
1236	0.34									16	8.2	0.6	2.25	16 x 8.2 x 0.6
1250	0.30	18	9.2	1.0	1.4									18 x 9.2 x 1.0
1346	0.23					12.5	6.2	0.7	1.7					12.5 x 6.2 x 0.7
1420	0.49					22.5	11.2	0.8	2.25					22.5 x 11.2 x 0.8
1490	0.41					20	10.2	0.8	2.15					20 x 10.2 x 0.8
1530	0.34	20	10.2	1.1	1.55									20.0 x 10.2 x 1.1

Disc springs SZ 8300

arranged according to forces



Explanation:

F = Spring force (N) of a disc spring or a group with $s = 0.75 h_0$

The named force at two or threefold coating arrangement is the theoretically calculated value. The actual values deviate from this due to friction losses.

s = Stroke of a single disc or a group ($0.75 h_0$)

l_{01} = Height of a single disc ($h_0 + t$)

l_{02} = Height of a disc set with twofold coating arrangement ($h_0 + 2 \cdot t$)

l_{03} = Height of a disc set with threefold coating arrangement ($h_0 + 3 \cdot t$)



Add size to order number

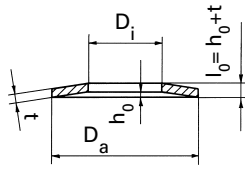
Order number **SZ 8300**.

 x x

Spring force F _n (N)	s = 0.75 h ₀	D _a	D _i	t	l ₀₁	D _a	D _i	t	l ₀₂	D _a	D _i	t	l ₀₃	
1626	0.23					14	7.2	0.8	1.9					14 x 7.2 x 0.8
1665	0.30									15	5.2	0.7	2.5	15 x 5.2 x 0.7
1700	0.75	35.5	18.3	1.25	2.25					18	9.2	0.7	2.6	35.5 x 18.3 x 1.25
1716	0.38													18 x 9.2 x 0.7
1736	0.53					25	12.2	0.9	2.5					25 x 12.2 x 0.9
1920	0.68	31.5	16.3	1.25	2.15									31.5 x 16.3 x 1.25
1950	0.38	22.5	11.2	1.25	1.75									22.5 x 11.2 x 1.25
2000	0.26					16	8.2	0.9	2.15					16 x 8.2 x 0.9
2019	0.23									12.5	6.2	0.7	2.4	12.5 x 6.2 x 0.7
2080	0.41					20	10.2	0.9	2.35					20 x 10.2 x 0.9
2130	0.49									22.5	11.2	0.8	3.05	22.5 x 11.2 x 0.8
2220	0.60					28	14.2	1.0	2.8					28 x 14.2 x 1.0
2235	0.41									20	10.2	0.8	2.95	20 x 10.2 x 0.8
2330	0.45	23	12.2	1.25	1.85									23 x 12.2 x 1.25
2439	0.23									14	7.2	0.8	2.7	14 x 7.2 x 0.8
2500	0.30					18	9.2	1.0	2.4					18 x 9.2 x 1.0
2604	0.53									25	12.2	0.9	3.4	25 x 12.2 x 0.9
2620	0.86	40	20.4	1.5	2.65									40 x 20.4 x 1.5
2850	0.49	28	14.2	1.5	2.15									28 x 14.2 x 1.5
2910	0.41	25	12.2	1.5	2.05									25 x 12.2 x 1.5
3000	0.26									16	8.2	0.9	3.05	16 x 8.2 x 0.9
3060	0.34					20	10.2	1.1	2.65					20 x 10.2 x 1.1
3120	0.41									20	10.2	0.9	3.25	20 x 10.2 x 0.9
3330	0.60									28	14.2	1.0	3.8	28 x 14.2 x 1.0
3400	0.75					35.5	18.3	1.25	3.5					35.5 x 18.3 x 1.25
3660	0.98	45	22.4	1.75	3.05									45 x 22.4 x 1.75
3750	0.30									18	9.2	1.0	3.4	18 x 9.2 x 1.0
3840	0.68					31.5	16.3	1.25	3.4					31.5 x 16.3 x 1.25
3900	0.38					22.5	11.2	1.25	3.0					22.5 x 11.2 x 1.25
3900	0.53	31.5	16.3	1.75	2.45									31.5 x 16.3 x 1.75
4440	1.20	56	28.5	2.0	3.6									56 x 28.5 x 2.0
4590	0.34									20	10.2	1.1	3.75	20 x 10.2 x 1.1
4660	0.45					23	12.2	1.25	3.1					23 x 12.2 x 1.25
4760	1.05	50	25.4	2.0	3.4									50 x 25.4 x 2.0
5100	0.75									35.5	18.3	1.25	4.75	35.5 x 18.3 x 1.25
5190	0.60	35.5	18.3	2.0	2.8									35.5 x 18.3 x 2.0
5240	0.86					40	20.4	1.5	4.15					40 x 20.4 x 1.5
5700	0.49					28	14.2	1.5	3.65					28 x 14.2 x 1.5

Disc springs SZ 8300

arranged according to forces



Explanation:

F = Spring force (N) of a disc spring or a group with $s = 0.75 h_0$
 The named force at two or threefold coating arrangement is the theoretically calculated value. The actual values deviate from this due to friction losses.

s = Stroke of a single disc or a group ($0.75 h_0$)

l_{01} = Height of a single disc ($h_0 + t$)

l_{02} = Height of a disc set with twofold coating arrangement ($h_0 + 2 \cdot t$)

l_{03} = Height of a disc set with threefold coating arrangement ($h_0 + 3 \cdot t$)



Add size to order number

Order number SZ 8300.														<input type="text"/> x <input type="text"/> x <input type="text"/>		
Spring force F _n (N)	s = 0.75 h ₀	D _a	D _i	t	l ₀₁	D _a	D _i	t	l ₀₂	D _a	D _i	t	l ₀₃			
5760	0.68									31.5	16.3	1.25	4.65	31.5 x 16.3 x 1.25		
5820	0.41					25	12.2	1.50	3.55					25 x 12.2 x 1.5		
5850	0.38									22.5	11.2	1.25	4.25	22.5 x 11.2 x 1.25		
6540	0.68	40	20.4	2.25	3.15									40 x 20.4 x 2.25		
6990	0.45									23	12.2	1.25	4.35	23 x 12.2 x 1.25		
7180	1.31	63	31	2.5	4.25									63 x 31 x 2.5		
7320	0.98					45	22.4	1.75	4.8					45 x 22.4 x 1.75		
7720	0.75	45	22.4	2.5	3.5									45 x 22.4 x 2.5		
7800	0.53					31.5	16.3	1.75	4.2					31.5 x 16.3 x 1.75		
7860	0.86									40	20.4	1.5	5.65	40 x 20.4 x 1.5		
8550	0.49									28	14.2	1.5	5.15	28 x 14.2 x 1.5		
8730	0.41									25	12.2	1.5	5.05	25 x 12.2 x 1.5		
8880	1.20					56	28.5	2.0	5.6					56 x 28.5 x 2.0		
9060	1.05	50	25.4	2.5	3.9									50 x 25.4 x 2.5		
9520	1.05					50	25.4	2.0	5.4					50 x 25.4 x 2.0		
10380	0.60					35.5	18.3	2.0	4.8					35.5 x 18.3 x 2.0		
10980	0.98									45	22.4	1.75	6.55	45 x 22.4 x 1.75		
11400	0.98	56	28.5	3.0	4.3									56 x 28.5 x 3.0		
11700	0.53									31.5	16.3	1.75	5.95	31.5 x 16.3 x 1.75		
12000	0.83	50	25.4	3.0	4.1									50 x 25.4 x 3.0		
13080	0.68					40	20.4	2.25	5.4					40 x 20.4 x 2.25		
13320	1.20									56	28.5	2.0	7.6	56 x 28.5 x 2.0		
14280	1.05									50	25.4	2.0	7.4	50 x 25.4 x 2.0		
14360	1.31					63	31	2.5	6.75					63 x 31 x 2.5		
15000	1.05	63	31	3.5	4.9									63 x 31 x 3.5		
15440	0.75					45	22.4	2.5	6.00					45 x 22.4 x 2.5		
15570	0.60									35.5	18.3	2.0	6.8	35.5 x 18.3 x 2.0		
18120	1.05					50	25.4	2.5	6.40					50 x 25.4 x 2.5		
19620	0.68									40	20.4	2.25	7.65	40 x 20.4 x 2.25		
21540	1.31									63	31	2.5	9.25	63 x 31 x 2.5		
22800	0.98					56	28.5	3.0	7.3					56 x 28.5 x 3.0		
23160	0.75									45	22.4	2.5	8.5	45 x 22.4 x 2.5		
24000	0.83					50	25.4	3.0	7.1					50 x 25.4 x 3.0		
27180	1.05									50	25.4	2.5	8.9	50 x 25.4 x 2.5		
30000	1.05					63	31	3.5	8.4					63 x 31 x 3.5		
34200	0.98									56	28.5	3.0	10.3	56 x 28.5 x 3.0		
36000	0.83									50	25.4	3.0	10.1	50 x 25.4 x 3.0		
45000	1.05									63	31	3.5	11.9	63 x 31 x 3.5		

Distance and fitting unit SZ 8580



Distance collar and fitting unit

The distance collar and fitting unit is used as a holding piece, spring unit, fitting bolt or distance collar unit.

Version:

Spacer pipe: Material, 9 S Mn 28 K, case-hardened 62–65 HRC, outer diameter ground

Note:

The distance collar and fitting unit is delivered with a mounted O-ring. Please remove this before installation.

Order example:

Distance collar and fitting unit cpl. **SZ 8580**

$d_1 = 12 \text{ mm}$, $l_1 = 50 \text{ mm}$

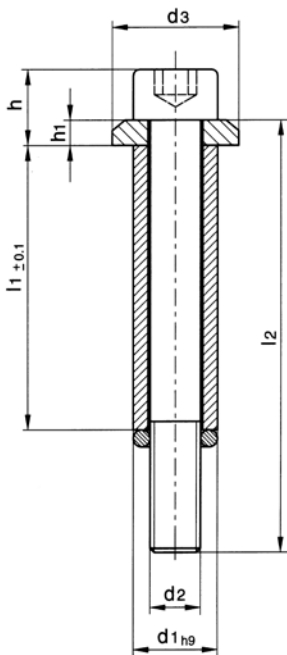
Addition **12 x 050**

Order number **SZ 8580.12 x 050**

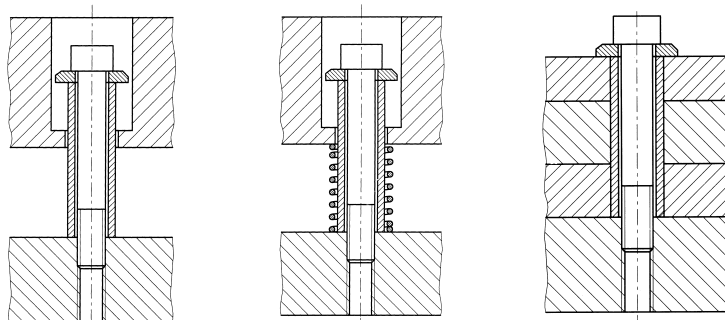
Add size to order number

Order number **SZ 8580.**

x



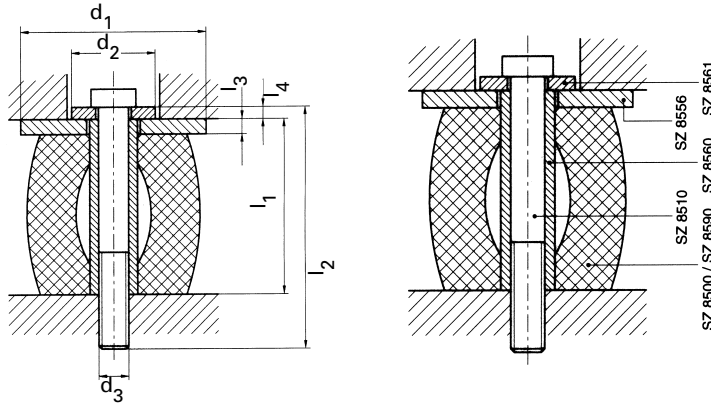
d_1	d_2	d_3	l_1	l_2	h	h_1	
10	M6	15	20	35	10	4	10 x 020
			30	45			10 x 030
			40	60			10 x 040
			50	70			10 x 050
			63	80			10 x 063
			80	100			10 x 080
12	M8	19	20	35	13	5	12 x 020
			30	45			12 x 030
			40	60			12 x 040
			50	70			12 x 050
			63	80			12 x 063
			80	100			12 x 080
16	M10	23	30	50	15.5	5.5	16 x 030
			40	60			16 x 040
			50	70			16 x 050
			63	80			16 x 063
			80	100			16 x 080
			100	120			16 x 100
20	M12	27	30	50	19	7	20 x 030
			40	60			20 x 040
			50	70			20 x 050
			63	90			20 x 063
			80	100			20 x 080
			100	120			20 x 100
25	M16	34	50	80	23	7	25 x 050
			63	90			25 x 063
			80	110			25 x 080
			100	130			25 x 100
			125	150			25 x 125



Use examples

Spring unit SZ 8526, SZ 8527

single for elastomer springs



Spring unit, complete

This spring unit can be used for any strokes. The stroke, including the pre-load, is a maximum of 25 % or 35 % of the L_0 of the elastomer springs used.

- The complete spring unit comprises:
- Elastomer spring SZ 8500 or SZ 8590
 - Spring washer SZ 8556
 - Disc SZ 8561
 - Spacer pipe SZ 8560
 - Socket-head screw SZ 8510

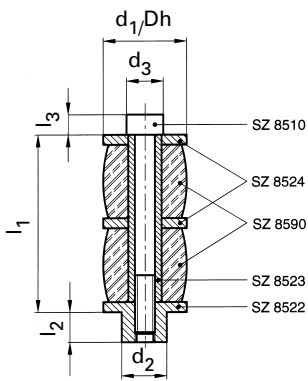
Order example: Spring unit with rubber spring **SZ 8500**
 $d_1 = 50 \text{ mm}$, $l_1 = 63 \text{ mm}$
 Addition **050 x 063**
 Order number **SZ 8526.050 x 063**

Add size to order number

d_1	d_2	d_3	l_1	l_2	l_3	l_4	Elast. spring	
With rubber spring SZ 8500		Order number SZ 8526.						<input type="text"/> x <input type="text"/>
With elastomer spring SZ 8590		Order number SZ 8527.						<input type="text"/> x <input type="text"/>
30	17	M6	20	30	5	3	025 x 020	030 x 020
30	17	M6	30	40	5	3	025 x 032	030 x 032
30	17	M6	40	50	5	3	025 x 040	030 x 040
40	23	M8	30	50	5	4	032 x 032	040 x 032
40	23	M8	40	60	5	4	032 x 040	040 x 040
40	23	M8	50	70	5	4	032 x 050	040 x 050
40	23	M8	63	80	5	4	032 x 063	040 x 063
50	23	M8	30	50	5	4	040 x 032	050 x 032
50	23	M8	40	60	5	4	040 x 040	050 x 040
50	23	M8	50	70	5	4	040 x 050	050 x 050
50	23	M8	63	80	5	4	040 x 063	050 x 063
50	23	M8	80	100	5	4	040 x 080	050 x 080
60	26	M10	30	50	6	4	050 x 032	060 x 032
60	26	M10	40	60	6	4	050 x 040	060 x 040
60	26	M10	50	70	6	4	050 x 050	060 x 050
60	26	M10	63	80	6	4	050 x 063	060 x 063
60	26	M10	80	100	6	4	050 x 080	060 x 080
60	26	M10	100	120	6	4	050 x 100	060 x 100
80	26	M10	30	50	6	4	063 x 032	080 x 032
80	26	M10	40	60	6	4	063 x 040	080 x 040
80	26	M10	50	70	6	4	063 x 050	080 x 050
80	26	M10	63	80	6	4	063 x 063	080 x 063
80	26	M10	80	100	6	4	063 x 080	080 x 080
80	26	M10	100	120	6	4	063 x 100	080 x 100
80	26	M10	125	140	6	4	063 x 125	080 x 125
100	30	M12	30	50	8	5	080 x 032	100 x 032
100	30	M12	40	60	8	5	080 x 040	100 x 040
100	30	M12	50	70	8	5	080 x 050	100 x 050
100	30	M12	63	80	8	5	080 x 063	100 x 063
100	30	M12	80	100	8	5	080 x 080	100 x 080
100	30	M12	100	120	8	5	080 x 100	100 x 100
100	30	M12	125	140	8	5	080 x 125	100 x 125
120	30	M12	30	50	8	5	100 x 032	120 x 032
120	30	M12	40	60	8	5	100 x 040	120 x 040
120	30	M12	50	70	8	5	100 x 050	120 x 050
120	30	M12	63	80	8	5	100 x 063	120 x 063
120	30	M12	80	100	8	5	100 x 080	120 x 080
120	30	M12	100	120	8	5	100 x 100	120 x 100

Elastomer spring units

SZ 8520, SZ 8522, SZ 8523, SZ 8524



Complete spring units, pre-loaded

These spring units can be used for any strokes. The stroke, including the pre-load, is a maximum of 25 % of the L_0 of the elastomer springs used SZ 8590. The spring force can be seen on the force path diagram of SZ 8590.

Order example: Spring unit, complete pre-loaded, **SZ 8520**
 Diameter 40 mm
 Installation height 83 mm
 Addition **40 x 083**
 Order number **SZ 8520 x 40 x 083**

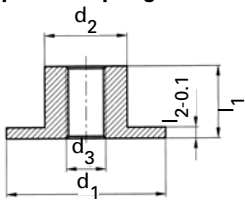
Add size to order number

Order number **SZ 8520.**

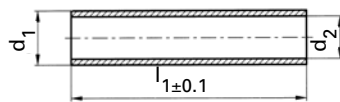
 x

Sleeves						SZ 8510 in	SZ 8522 in	SZ 8523 in	SZ 8524 in	SZ 8590 in	
\emptyset	d_1/D_h	d_2	d_3	l_1	l_2	SZ 8520 included	SZ 8520 included	SZ 8520 included	SZ 8520 included	SZ 8520 included	
25	13	10	10	53	9	06 x 060	25	08 x 050	25	020 x 025	25 x 053
				67		06 x 080	25	08 x 064	25	020 x 032	25 x 067
				67		08 x 080	32	10 x 064	32	025 x 025	32 x 053
32	16	13	13	53	11	08 x 060	32	10 x 050	32	025 x 032	32 x 067
				67		08 x 080	32	10 x 064	32	025 x 040	32 x 083
				83		08 x 090	32	10 x 080	32	025 x 040	32 x 083
40	20	16	16	67	14	10 x 080	40	13 x 064	40	032 x 032	40 x 067
				83		10 x 090	40	13 x 080	40	032 x 040	40 x 083
				103		10 x 110	40	13 x 100	40	032 x 050	40 x 103
50	25	16	16	86	14	10 x 090	50	13 x 082	50	040 x 040	50 x 086
				106		10 x 120	50	13 x 102	50	040 x 050	50 x 106
				132		10 x 140	50	13 x 128	50	040 x 063	50 x 132

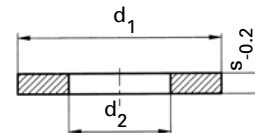
Individual parts for spring units



Locating bush



Spacer pipe



Disc

Add size to order number

Add size to order number

Add size to order number

Order number **SZ 8522.**

d_1	d_2	d_3	l_1	$l_{2-0.1}$	
25	13	M6	12	3	25
32	16	M8	14	3	32
40	20	M10	17	3	40
50	25	M10	18	4	50

Order number **SZ 8523.**

 x

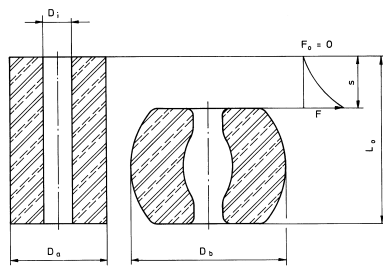
d_1	d_2	l	
8.0	6.5	50	08 x 050
		64	08 x 064
10.0	8.5	50	10 x 050
		64	10 x 064
		80	10 x 080
		13.0	11.0
13.0	11.0	80	13 x 080
		82	13 x 082
		100	13 x 100
		102	13 x 102
		128	13 x 128

Order number **SZ 8524.**

d_1	d_2	$s_{-0.2}$	
25	8.0	3	25
32	10.0	3	32
40	13.0	3	40
50	13.0	4	50

Elastomer springs SZ 8500

STEINEL®



Order example: Rubber spring **SZ 8500**

$D_a = 32$ mm, $l_0 = 40$ mm

Addition **032 x 040**

Order number **SZ 8500.032 x 040**

DIN ISO 10069

Rubber springs

Material:

Chloroprene elastomer (CR),
hardness 70 ± 3 Shore A

Permissible stroke $s_{max} = 0.35 L_0$

Setting inclination 3–5 % of L_0

Rubber springs are suitable for large strokes.

Thermal stability up to $+80$ °C/ 176 °F

up to $+120$ °C/ 248 °F for shorter periods.

Add size to
order number

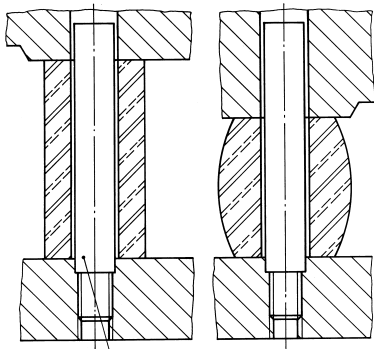
Order number **SZ 8500**

x

D_a	D_i	L_0	D_b	d_1	Standard pack	
16	6.5	12	22	28	10	016 x 012
		16			10	016 x 016
		20			10	016 x 020
		25			10	016 x 025
20	8.5	16	27	32	10	020 x 016
		20			10	020 x 020
		25			10	020 x 025
		32			10	020 x 032
25	10.5	20	34	36	5	025 x 020
		25			5	025 x 025
		32			5	025 x 032
		40			5	025 x 040
32	13.5	32	43	45	5	032 x 032
		40			5	032 x 040
		50			5	032 x 050
		63			5	032 x 063
40	13.5	32	54	56	3	040 x 032
		40			3	040 x 040
		50			3	040 x 050
		63			3	040 x 063
		80			3	040 x 080
50	17	32	68	71	3	050 x 032
		40			3	050 x 040
		50			3	050 x 050
		63			2	050 x 063
		80			2	050 x 080
		100			2	050 x 100
63	17	32	85	90	2	063 x 032
		40			2	063 x 040
		50			2	063 x 050
		63			2	063 x 063
		80			1	063 x 080
		100			1	063 x 100
		125			1	063 x 125
80	21	32	108	112	1	080 x 032
		40			1	080 x 040
		50			1	080 x 050
		63			1	080 x 063
		80			1	080 x 080
		100			1	080 x 100
		125			1	080 x 125
100	21	32	135	140	1	100 x 032
		40			1	100 x 040
		50			1	100 x 050
		63			1	100 x 063
		80			1	100 x 080
		100			1	100 x 100
		125			1	100 x 125
125	27	32	169	180	1	125 x 032
		40			1	125 x 040
		50			1	125 x 050
		63			1	125 x 063
		80			1	125 x 080
		100			1	125 x 100
		125			1	125 x 125
		160			1	125 x 160

Elastomer springs

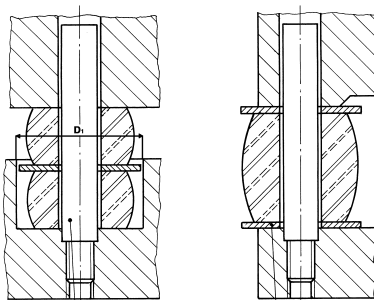
installation examples – force path diagrams for rubber springs SZ 8500



Guide pins
SZ 8555

Single coating

Installation examples:

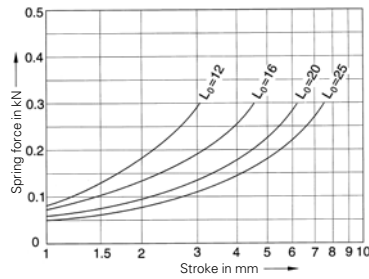


Guide pins
SZ 8555

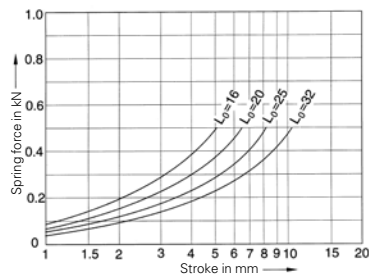
Spring washer
SZ 8556

Double coating

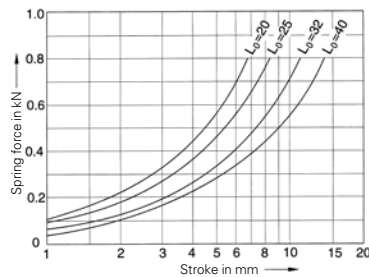
Single coating



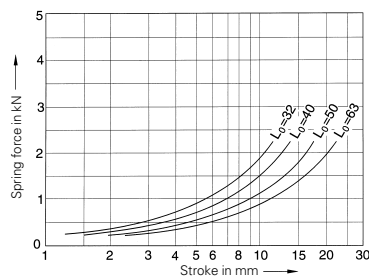
Picture 1. Spring D_a 16



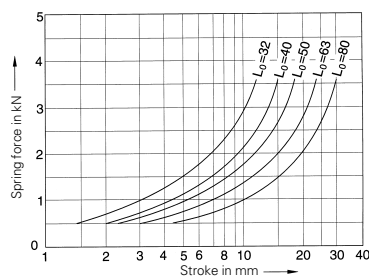
Picture 2. Spring D_a 20



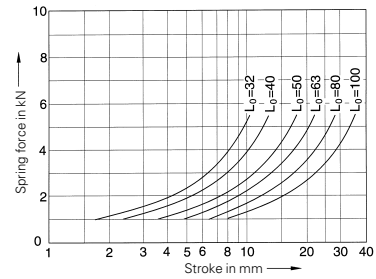
Picture 3. Spring D_a 25



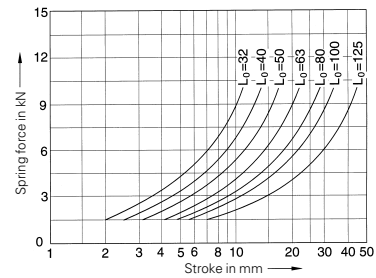
Picture 4. Spring D_a 32



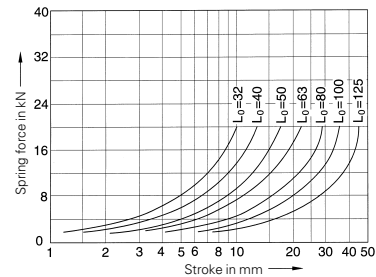
Picture 5. Spring D_a 40



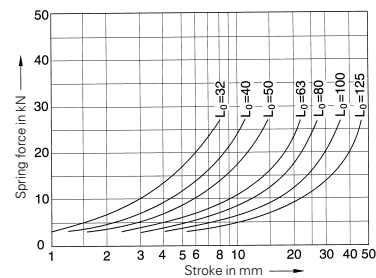
Picture 6. Spring D_a 50



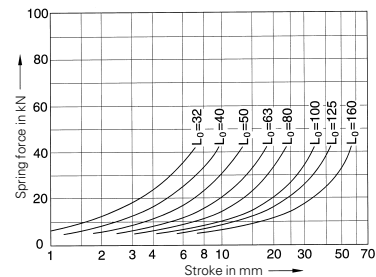
Picture 7. Spring D_a 63



Picture 8. Spring D_a 80

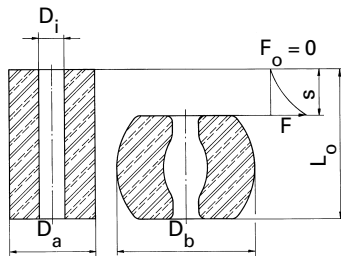


Picture 9. Spring D_a 100



Picture 10. Spring D_a 125

Elastomer springs SZ 8590



Order example: Polyurethane spring **SZ 8590**

$D_a = 50 \text{ mm}$, $l_0 = 63 \text{ mm}$

Addition **050 x 063**

Order number **SZ 8590.050 x 063**

DIN ISO 10069

Polyurethane springs

Material:

Polyurethane elastomer (PUR),
hardness 90 ± 5 Shore A

Permissible stroke $s_{\max} = 0.25 L_0$
Setting inclination 8–10 % of L_0
Polyurethane springs are suitable for large
spring forces.

Thermal stability up to $+80 \text{ °C}/176 \text{ °F}$
up to $+120 \text{ °C}/248 \text{ °F}$ for shorter periods.

Add size to
order number

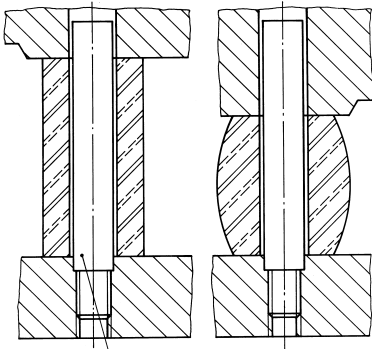
Order number **SZ 8590**

x

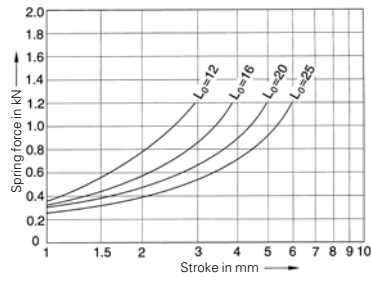
D_a	D_i	L_0	D_b	D_1	Standard pack	
16	6.5	12	20	28	10	016 x 012
		16			10	016 x 016
		20			10	016 x 020
		25			10	016 x 025
20	8.5	16	25	32	10	020 x 016
		20			10	020 x 020
		25			10	020 x 025
		32			10	020 x 032
25	10.5	20	31	36	5	025 x 020
		25			5	025 x 025
		32			5	025 x 032
		40			5	025 x 040
32	13.5	32	40	45	5	032 x 032
		40			5	032 x 040
		50			5	032 x 050
		63			5	032 x 063
40	13.5	32	50	56	3	040 x 032
		40			3	040 x 040
		50			3	040 x 050
		63			3	040 x 063
		80			3	040 x 080
50	17	32	63	71	3	050 x 032
		40			3	050 x 040
		50			3	050 x 050
		63			2	050 x 063
		80			2	050 x 080
		100			2	050 x 100
63	17	32	79	90	2	063 x 032
		40			2	063 x 040
		50			2	063 x 050
		63			2	063 x 063
		80			1	063 x 080
		100			1	063 x 100
		125			1	063 x 125
80	21	32	100	112	1	080 x 032
		40			1	080 x 040
		50			1	080 x 050
		63			1	080 x 063
		80			1	080 x 080
		100			1	080 x 100
		125			1	080 x 125
100	21	32	125	140	1	100 x 032
		40			1	100 x 040
		50			1	100 x 050
		63			1	100 x 063
		80			1	100 x 080
		100			1	100 x 100
		125			1	100 x 125
125	27	32	156	180	1	125 x 032
		40			1	125 x 040
		50			1	125 x 050
		63			1	125 x 063
		80			1	125 x 080
		100			1	125 x 100
		125			1	125 x 125
		160			1	125 x 160

Elastomer springs

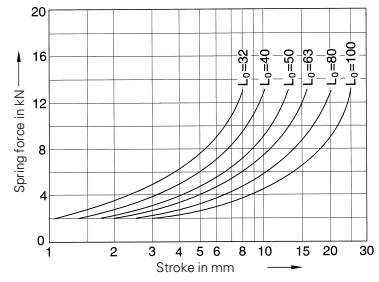
installation examples – force path diagrams for polyurethane springs SZ 8590



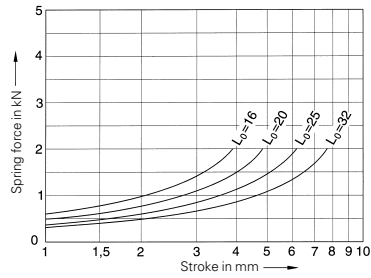
Single coating



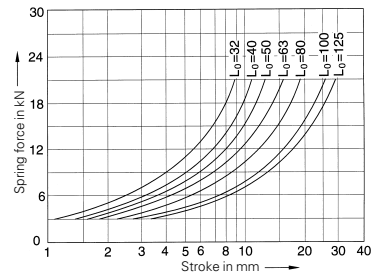
Picture 1. Spring D_a 16



Picture 6. Spring D_a 50

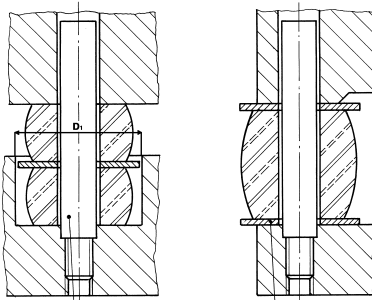


Picture 2. Spring D_a 20



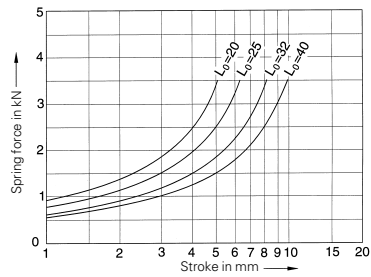
Picture 7. Spring D_a 63

Installation examples:

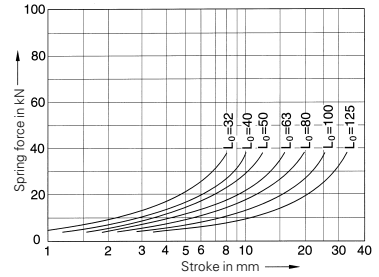


Double coating

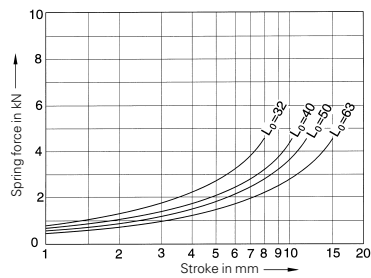
Single coating



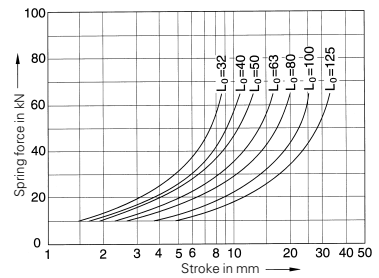
Picture 3. Spring D_a 25



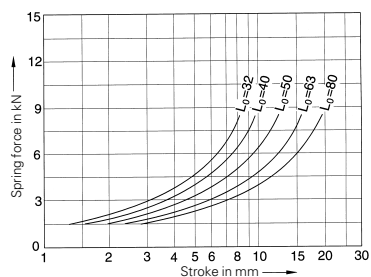
Picture 8. Spring D_a 80



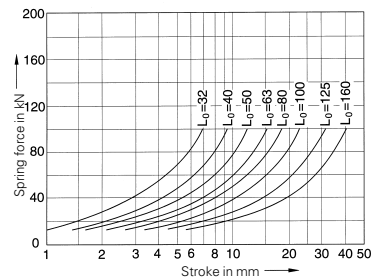
Picture 4. Spring D_a 32



Picture 9. Spring D_a 100



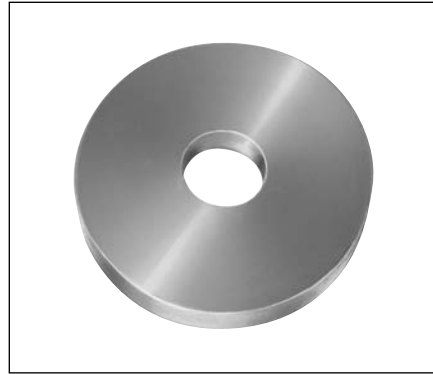
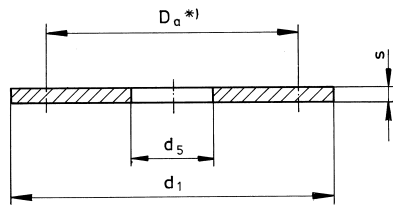
Picture 5. Spring D_a 40



Picture 10. Spring D_a 125

Spring washer SZ 8556

for rubber and polyurethane springs



DIN ISO 10069

Material:
Brass

Order example: Spring washer (flat) **SZ 8556**
for rubber and polyurethane springs
 $D_a = 20$ mm
Addition **020**
Order number **SZ 8556.020**

Add size to
order number

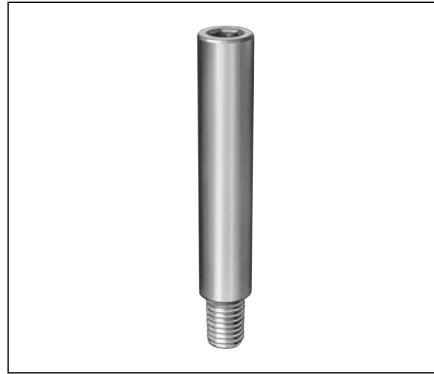
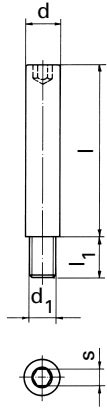
Order number **SZ 8556**

$D_a^*)$	d_1	d_5	s	
16	20	6.5	4	016
20	25	8.5	4	020
25	30	10.5	5	025
32	40	13.5	5	032
40	50	13.5	5	040
50	60	16.5	6	050
63	80	16.5	6	063
80	100	20.5	8	080
100	120	20.5	8	100
125	150	26.0	8	125

*) D_a = Spring diameter

Guide pins SZ 8555

for rubber and polyurethane springs



DIN ISO 10069

Material:

Strength class 8.8

Order example: Guide pins for rubber and polyurethane springs

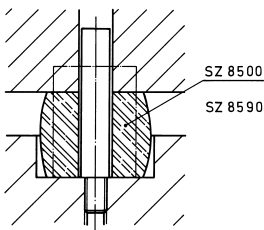
SZ 8555

d = 10 mm, l = 32 mm

Addition **10 x 032**

Order number **SZ 8555.10 x 032**

Installation example:



Add size to
order number

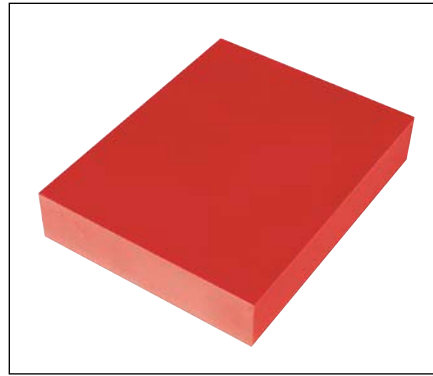
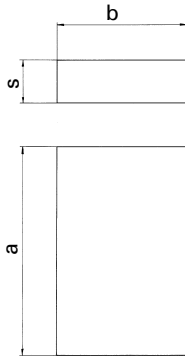
Add size to
order number

Order number SZ 8555 <input type="text"/> x <input type="text"/>						
d_{h11}	d_1	l	l_1	s	Stand-ard pack	
6	M4	20	6	3	10	06 x 020
		25			10	06 x 025
		32			10	06 x 032
8	M6	20	9	4	10	08 x 020
		25			10	08 x 025
		32			10	08 x 032
		40			10	08 x 040
		50			10	08 x 050
10	M8	20	15	5	10	10 x 020
		25			10	10 x 025
		32			5	10 x 032
		40			5	10 x 040
		50			5	10 x 050
		63			5	10 x 063
13	M10	32	15	6	5	13 x 032
		40			5	13 x 040
		50			5	13 x 050
		63			5	13 x 063
		80			5	13 x 080
		95			5	13 x 095

Order number SZ 8555 <input type="text"/> x <input type="text"/>						
d_{h11}	d_1	l	l_1	s	Stand-ard pack	
16	M12	32	18	8	5	16 x 032
		40			5	16 x 040
		50			5	16 x 050
		63			5	16 x 063
		80			2	16 x 080
		95			2	16 x 095
20	M16	50	25	10	2	20 x 050
		63			2	20 x 063
		80			2	20 x 080
		95			2	20 x 095
		118			2	20 x 118
		140			2	20 x 140
25	M20	50	30	14	2	25 x 050
		63			2	25 x 063
		80			2	25 x 080
		95			2	25 x 095
		118			2	25 x 118
		140			2	25 x 140
		180			2	25 x 180

Polyurethane plates SZ 5190

STEINEL®



Material:
Polyurethane elastomer,
polyester-based,
hardness 90 ± 5 Shore A

Order example: Polyurethane plate
SZ 5190
a x b = 150 x 100 mm, s = 50 mm
Addition **150 x 100 x 50**
Order number **SZ 5190.150 x 100 x 50**

Add size to
order number

Add size to
order number

Add size to
order number

Order number SZ 5190 <input type="text"/> x <input type="text"/>			
a	b	s	
75	75	25	075 x 75 x 25
		50	075 x 75 x 50
		75	075 x 75 x 75
100	75	12.5	100 x 75 x 12.5
		25	100 x 75 x 25
		50	100 x 75 x 50
		75	100 x 75 x 75
150	75	12.5	150 x 75 x 12.5
		25	150 x 75 x 25
		50	150 x 75 x 50
		75	150 x 75 x 75
100	100	12.5	100 x 100 x 12.5
		25	100 x 100 x 25
		50	100 x 100 x 50
		75	100 x 100 x 75
125	100	12.5	125 x 100 x 12.5
		25	125 x 100 x 25
		50	125 x 100 x 50
		75	125 x 100 x 75
150	100	12.5	150 x 100 x 12.5
		25	150 x 100 x 25
		50	150 x 100 x 50
		75	150 x 100 x 75
200	100	12.5	200 x 100 x 12.5
		25	200 x 100 x 25
		50	200 x 100 x 50
		75	200 x 100 x 75
125	125	12.5	125 x 125 x 12.5
		25	125 x 125 x 25
		50	125 x 125 x 50
		75	125 x 125 x 75
150	125	12.5	150 x 125 x 12.5
		25	150 x 125 x 25
		50	150 x 125 x 50
		75	150 x 125 x 75

Order number SZ 5190 <input type="text"/> x <input type="text"/>			
a	b	s	
200	125	12.5	200 x 125 x 12.5
		25	200 x 125 x 25
		50	200 x 125 x 50
		75	200 x 125 x 75
250	125	12.5	250 x 125 x 12.5
		25	250 x 125 x 25
		50	250 x 125 x 50
		75	250 x 125 x 75
150	150	12.5	150 x 150 x 12.5
		25	150 x 150 x 25
		50	150 x 150 x 50
		75	150 x 150 x 75
200	150	12.5	200 x 150 x 12.5
		25	200 x 150 x 25
		50	200 x 150 x 50
		75	200 x 150 x 75
250	150	12.5	250 x 150 x 12.5
		25	250 x 150 x 25
		50	250 x 150 x 50
		75	250 x 150 x 75
300	150	12.5	300 x 150 x 12.5
		25	300 x 150 x 25
		50	300 x 150 x 50
		75	300 x 150 x 75
200	200	12.5	200 x 200 x 12.5
		25	200 x 200 x 25
		50	200 x 200 x 50
		75	200 x 200 x 75
250	200	12.5	250 x 200 x 12.5
		25	250 x 200 x 25
		50	250 x 200 x 50
		75	250 x 200 x 75
300	200	12.5	300 x 200 x 12.5
		25	300 x 200 x 25
		50	300 x 200 x 50
		75	300 x 200 x 75

Order number SZ 5190 <input type="text"/> x <input type="text"/>			
a	b	s	
400	200	12.5	400 x 200 x 12.5
		25	400 x 200 x 25
		50	400 x 200 x 50
		75	400 x 200 x 75
250	250	12.5	250 x 250 x 12.5
		25	250 x 250 x 25
		50	250 x 250 x 50
		75	250 x 250 x 75
300	250	12.5	300 x 250 x 12.5
		25	300 x 250 x 25
		50	300 x 250 x 50
		75	300 x 250 x 75
400	250	12.5	400 x 250 x 12.5
		25	400 x 250 x 25
		50	400 x 250 x 50
		75	400 x 250 x 75
500	250	12.5	500 x 250 x 12.5
		25	500 x 250 x 25
		50	500 x 250 x 50
		75	500 x 250 x 75
300	300	12.5	300 x 300 x 12.5
		25	300 x 300 x 25
		50	300 x 300 x 50
		75	300 x 300 x 75
400	300	12.5	400 x 300 x 12.5
		25	400 x 300 x 25
		50	400 x 300 x 50
		75	400 x 300 x 75
500	300	12.5	500 x 300 x 12.5
		25	500 x 300 x 25
		50	500 x 300 x 50
		75	500 x 300 x 75
600	300	12.5	600 x 300 x 12.5
		25	600 x 300 x 25
		50	600 x 300 x 50
		75	600 x 300 x 75

Polyurethane rods SZ 5381, SZ 5391



Hollow round polyurethane rods

Material:

Polyurethane elastomer (PUR)

Raw material for springs in special lengths, damping plates, assembly parts and prototypes.

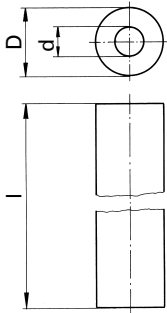
Available in hardnesses of
80 ± 5 Shore A and
90 ± 5 Shore A

Application tips:

Resistant to: Oil (lubricant oil), grease, alcohol, benzene, ozone

Partially resistant to: Water, lyes, acids
Please verify use in terms of duration, temperature and/or concentration.

Order example: Hollow round polyurethane rod, hardness 80, shore A, **SZ 5381**
D = 50 mm, l = 400 mm
Addition **050 x 400**
Order number **SZ 5381.050 x 400**



SZ 5381

Permissible stroke $s_{max} = 35\%$
Setting inclination 5–7 %
Thermal stability -20 °C/-4 °F
to +80 °C/176 °F
-40 °C/-40 °F to +120 °C/248 °F
for short periods

SZ 5391

Permissible stroke $s_{max} = 30\%$
Setting inclination 6–8 %
Thermal stability -20 °C/-4 °F
to +80 °C/176 °F
-40 °C/-40 °F to +120 °C/248 °F
for short periods

Hardness 80 ± 5 Shore A

Add size to
order number

Hardness 90 ± 5 Shore A

Add size to
order number

Order number **SZ 5381.**

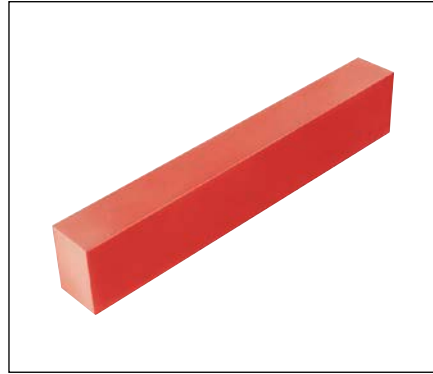
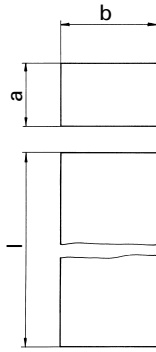
x

Order number **SZ 5391.**

x

D	d	l		
16	6.5	300	016 x 300	016 x 300
20	8.5	300	020 x 300	020 x 300
25	10.5	300	025 x 300	025 x 300
32	13.5	300	032 x 300	032 x 300
40	13.5	300	040 x 300	040 x 300
50	17.0	400	050 x 400	050 x 400
63	17.0	400	063 x 400	063 x 400
80	21.0	400	080 x 400	080 x 400
100	21.0	300	100 x 300	100 x 300
125	27.0	300	125 x 300	125 x 300

Polyurethane rods SZ 5290, SZ 5390



Polyurethane rods, rectangular

Material:

Polyurethane elastomer (PUR),
hardness 90 ± 5 Shore A

Order example: Polyurethane rods,
rectangular **SZ 5290**
a x b = 50 x 75 mm, l = 100 mm
Addition **50 x 75 x 100**
Order number **SZ 5290.50 x 75 x 100**

Add size to
order number

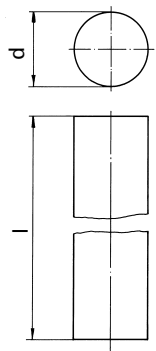
Order number SZ 5290 <input type="text"/> x <input type="text"/> x <input type="text"/>		
a x b	l	
25 x 25	300	25 x 25 x 300
	600	25 x 25 x 600
	1200	25 x 25 x 1200
25 x 37.5	200	25 x 37.5 x 200
	300	25 x 37.5 x 300
	600	25 x 37.5 x 600
	1200	25 x 37.5 x 1200

Add size to
order number

Order number SZ 5290 <input type="text"/> x <input type="text"/> x <input type="text"/>		
a x b	l	
50 x 50	100	50 x 50 x 100
	200	50 x 50 x 200
	300	50 x 50 x 300
	600	50 x 50 x 600
	1200	50 x 50 x 1200
50 x 75	100	50 x 75 x 100
	200	50 x 75 x 200
	300	50 x 75 x 300
	600	50 x 75 x 600
	1200	50 x 75 x 1200

Add size to
order number

Order number SZ 5290 <input type="text"/> x <input type="text"/> x <input type="text"/>		
a x b	l	
75 x 75	100	75 x 75 x 100
	200	75 x 75 x 200
	300	75 x 75 x 300
	600	75 x 75 x 600
75 x 100	100	75 x 100 x 100
	200	75 x 100 x 200
	300	75 x 100 x 300
	600	75 x 100 x 600



Polyurethane rods, round

Material:

Polyurethane elastomer (PUR),
hardness 90 ± 5 Shore A

Order example: Polyurethane rod,
round **SZ 5390**
d = 50 mm, l = 100 mm
Addition **50 x 100**
Order number **SZ 5390.50 x 100**

Add size to
order number

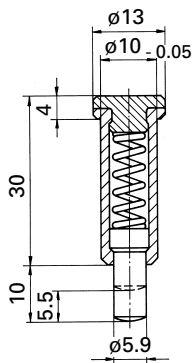
Order number SZ 5390 <input type="text"/> x <input type="text"/> x <input type="text"/>		
d	l	
25	200	25 x 200
	300	25 x 300
32	100	32 x 100
	200	32 x 200
	300	32 x 300

Add size to
order number

Order number SZ 5390 <input type="text"/> x <input type="text"/> x <input type="text"/>		
d	l	
50	63	50 x 063
	80	50 x 080
	100	50 x 100
	160	50 x 160
	200	50 x 200
	300	50 x 300

Add size to
order number

Order number SZ 5390 <input type="text"/> x <input type="text"/> x <input type="text"/>		
d	l	
75	80	75 x 080
	100	75 x 100
	160	75 x 160
	200	75 x 200
	300	75 x 300



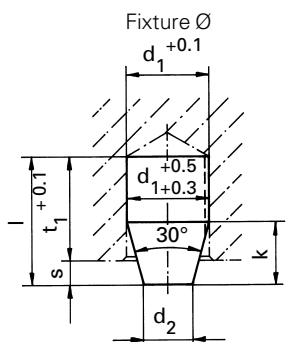
Cushioned thrust pieces

Material:
Free-cutting steel,
thrust bolt, hardened

Pressure:
Start ~ 45 N
Finish ~ 100 N

Installation in mounting bores 10 H7

Order example: Cushioned thrust piece
SZ 8135
Mounting diameter 10 mm
Addition **10**
Order number **SZ 8135.10**



Polyurethane thrust pieces

Material:
Polyurethane elastomer (PUR),
hardness 90 ± 5 Shore A,
installation in mounting bores $d_1 \pm 0.1$

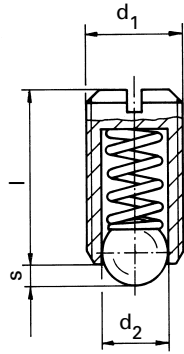
Order example: Polyurethane thrust piece
SZ 8460
 $d_1 = 16$ mm
Addition **16**
Order number **SZ 8460.16**

Add size to
order number

Order number **SZ 8460.**

$d_1^{+0.5}$ $1+0.3$	d_2	l	k	$t_1^{+0.1}$	Compressive force (N)	with s	Standard pack	
6	3.6	9.5	4.5	8	150	1.5	20	06
10	6	15.5	7.5	13	350	2.5	20	10
16	9.5	25	12	21	1500	4	10	16

Cushioned thrust pieces SZ 8130, SZ 8131



Cushioned thrust pieces

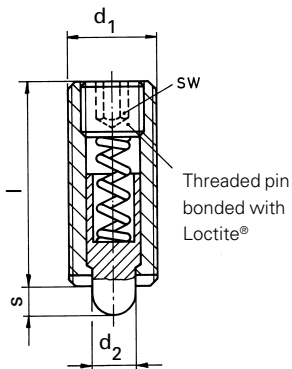
Material:
Free-cutting steel,
ball, hardened

Order example: Cushioned thrust piece
SZ 8130
 $d_1 = M10$
Addition **10**
Order number **SZ 8130.10**

Add size to
order number

Order number **SZ 8130.**

d_1	d_2	l	s	Thrust (N) start ~	Thrust (N) finish ~	Standard pack	
M3	1.5	7	0.5	2.2	3	50	03
M4	2.5	9	0.8	6	12	50	04
M5	3	12	0.9	7	13	50	05
M6	3.5	14	1	9	15	50	06
M8	5	16	1.5	20	35	50	08
M10	6	19	2	25	45	50	10
M12	8	22	2.5	35	60	25	12
M16	10	24	3.5	65	110	25	16



Cushioned thrust pieces

Material:
Free-cutting steel,
thrust bolt, hardened

Order example: Cushioned thrust piece
SZ 8131
 $d_1 = M8$
Addition **08**
Order number **SZ 8131.08**

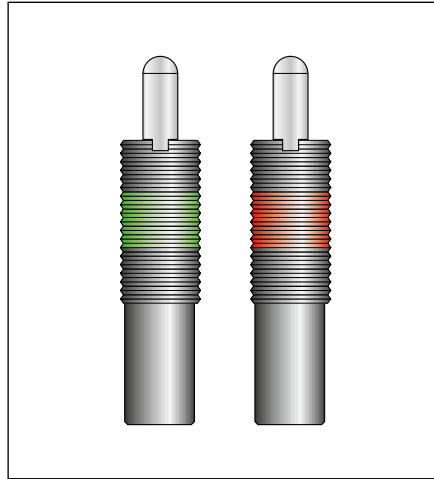
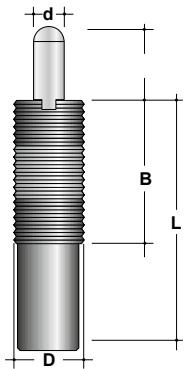
Add size to
order number

Order number **SZ 8131.**

d_1	d_2	l	s	SW	Thrust (N) start ~	Thrust (N) finish ~	Standard pack	
M3	1	12	1	0.7	1.7	3.5	25	03
M4	1.5	15	1.5	1.3	5	15	25	04
M5	2.4	18	2.3	1.5	7	20	25	05
M6	2.7	20	2.5	2	7	20	25	06
M8	3.5	22	3	2.5	9	35	10	08
M10	4	22	3	3	9	35	10	10
M12	6	28	4	4	15	55	10	12
M16	7.5	32	5	5	45	100	10	16

Cushioned thrust pieces SZ 8140, SZ 8145

mechanical



Application:

Cushioned thrust pieces are mainly used in tool production and machine engineering as lift-off pins, blank holders, ejectors or damping springs.

Installation note:

Screwing the cushioned thrust pieces in and out should only be done using the correct special key SZ 8146.12, SZ 8146.16 or SZ 8146.24. The coloured thread marking also serves to secure the thread.

Add size to order number

Cushioned thrust piece, light series

Colour coding: Green

Order number SZ 8140. <input type="text"/> x <input type="text"/>							
D	Stroke	L	B	d	Initial force	End force	
mm	mm	mm	mm	mm	daN	daN	
M12	10	43	35	5.5	0.4	2	12 x 010
M16	10	60	35	7.5	1.3	4	16 x 010
	15	60			1.0		16 x 015
	20	80			1.3		16 x 020
	30	125			1.8		16 x 030
	40	150			1.3		16 x 040
	50	150			1.3		16 x 050
M24	15	60	45	10	2.0	10	24 x 015

Order example: Cushioned thrust piece light series **SZ 8140**

D = M12, stroke 10 mm

Addition **12 x 010**

Order number **SZ 8140.12 x 010**

Add size to order number

Cushioned thrust piece, heavy series

Colour coding: Red

Order number SZ 8145. <input type="text"/> x <input type="text"/>							
D	Stroke	L	B	d	Initial force	End force	
mm	mm	mm	mm	mm	daN	daN	
M12	10	43	35	5.5	0.7	4	12 x 010
M16	10	60	35	7.5	2.7	8	16 x 010
	15	60			1.5		16 x 015
	20	80			1.7		16 x 020
	30	125			2.0		16 x 030
	40	150			2.6		16 x 040
	50	150			2.6		16 x 050
M24	15	60	45	10	4.0	20	24 x 015

Order example: Cushioned thrust piece, heavy series **SZ 8145**

D = M16, stroke 30 mm

Addition **16 x 030**

Order number **SZ 8145.16 x 030**