



Wire Die & Mould Springs

ISO 10243 – Rectangular Section & Round Section

Research & Development ongoing in parallel of quality assurance procedures in compliance with ISO 9001, ensure high sensitivity, durability and reliability criteria. Continuous improvement in our springs performance is monitored directly in the factory through comparative and destructive tests. The excellences of these products are verified with the increasing number of the customers selecting our springs in their dies and moulds.

The following main characteristics show the superiority of our springs:

- * Special profile / section usage to increase steel characteristics.
- * Usage of special wire winding machine.
- * Usage of special heat treatment developed by especially spring production.
- * Maximum care showing grinding and closing of spring ends in order to warranty optimum vertical and parallel acceleration.
- * All springs are coil shaped in order to warranty significant decrease of load losses in working conditions.
- * Special remoulding stroke methods in order to increase resistance against metal abrasion.
- * Special pretreatment and powder coating applications of our springs in order to ensure the best protection, preservation and completion.
- * Intensive control performed during production and final stage in order to warranty dimensional compliance and precision.
- * Spring load coefficient tolerances – nominal rate at all springs is +10%.

Code	Colour Series	Wire Section	Colour	Load	*XXL Long Life total deflection	Cycles	*Max. working total deflection	Cycles
AYY			Purple	Extra Light	35%	+3.000.000	50%	200.000
YY			Green	Light	30%	+3.000.000	40%	200.000
MY			Blue	Medium	25%	+3.000.000	37.5%	200.000
KY			Red	Heavy	20%	+3.000.000	30%	200.000
SY			Yellow	Extra Heavy	17%	+5.000.000	25%	300.000
GY			Brown	Ultra Heavy	10%	+5.000.000	15%	500.000

Code	Colour Series	Wire Section	Colour	Load
TVY			Green	Light
TBM			Blue	Medium
TRK			Red	Heavy

Cycles:

Lifetime statistic data based on tests carried out on items with central free lengths under the recommendations specified here below.

* **Total deflection:** preload + working stroke

When selecting and using the springs we recommend:

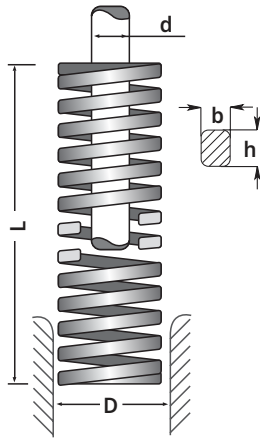
- 1- Select the lightest and longest springs working requirements allow.
- 2- Never select total deflections (preload + stroke) that are greater than the maximum deflection indicated in the catalogue. Also check this when sharpening the tools in the die.
- 3- Preload at least 5% of the free length of each spring, with a minimum of 2 mm.
- 4- Provide for an even base for each spring.
- 5- Guide the springs with an internal pin or deep housing to avoid buckling, in particular when $L/D > 3$.

- * Please select springs carefully during the design period.
- * The bigger the guide the longer the lifetime. It is essential to always use guide pin for all springs with a free length / diameter ratio exceeding x3.5.
- * Ensure support and perpendicularity of springs to the compression area.
- * If possible, use long springs at lower loadings (preloading should be increased properly).
- * Please apply minimum preloading of 5% of the free length.
- * Never apply pressure to the springs over maximum stroke.
- * Tool maintenance can vary the original working deflection of the springs. Always check and re-set the original working stroke. High risk of early failures or damages of the die / mould.
- * Please protect springs from abrasive activities.
- * In the temperature range of 120 ÷ 250°C consider a loss between 1 to 2% of the load every 40°C.
- * Please don't change a spring at a time, instead of this, use programmed maintenance procedure that all springs can be changed at the same time.
- * Any alteration on the surface of the springs (cutting, grinding, scratches, etc.) may significantly reduce the lifetime. Always replace the damaged springs with new ones.
- * Shoulder screw (Güvenal code: G39) should be used in usage of precision mechanical spring.



Code: **AYY** Colour: **Purple**

Extra Light Load Spring



D: Outer Diameter

d: Rod Diameter

b x h: Wire Section

L: Length

R: Load Rate (N)

XXL %: Long Life Deflection

Max %: Max. Working Deflection

S1: Deflection

F1: Load N

S2: Deflection

F2: Load N

N - Newton = (0.102) Kgf

1kg = 9.81 N



Order:
AYY. D x L

D	d	L	R	XXL 35 %		Max. 50 %	
				S1	F1	S2	F2
10	5	25	8.5	8.8	74	12.5	106
		32	6.5	11.2	73	16.0	104
		38	5.5	13.3	73	19.0	105
		44	5.0	15.4	77	22.01	110
		51	4.5	17.9	80	25.5	115
		64	3.3	22.4	74	32.0	106
		76	3.2	26.6	85	38.0	122
		b x h 2.1 x 0.9	305	0.6	106.8	64	152.5
13	6.3	25	15.5	8.8	136	12.5	194
		32	12.2	11.2	137	16.0	195
		38	10.3	13.3	137	19.0	196
		44	8.7	15.4	134	22.0	191
		51	7.5	17.9	134	25.5	191
		64	5.8	22.4	130	32.0	186
		76	4.7	26.6	125	38.0	179
		89	4.1	31.2	128	44.5	182
b x h 2.5 x 1.2	305	1.2	106.8	128	152.5	183	
16	8	25	20.2	8.8	177	12.5	253
		32	14.4	11.2	161	16.0	230
		38	12.3	13.3	164	19.0	234
		44	10.6	15.4	163	22.0	233
		51	8.9	17.9	159	25.5	227
		64	7.0	22.4	157	32.0	224
		76	5.8	26.6	154	38.0	220
		89	4.8	31.2	150	44.5	214
		102	4.0	35.7	143	51.0	204
		b x h 3.4 x 1.2	305	1.5	106.8	160	152.5
20	10	25	32.1	8.8	281	12.5	401
		32	24.7	11.2	277	16.0	395
		38	20.7	13.3	275	19.0	393
		44	17.8	15.4	274	22.0	392
		51	15.3	17.9	273	25.5	390
		64	12.1	22.4	271	32.0	387
		76	10.2	26.6	271	38.0	388
		89	8.6	31.2	268	44.5	383
		102	7.5	35.7	268	51.0	383
		115	6.7	40.3	270	57.5	385
		127	6.1	44.5	271	63.5	387
		139	5.5	48.7	268	69.5	382
b x h 4.0 x 1.7	305	2.5	106.8	267	152.5	381	
25	12.5	25	52.7	8.8	461	12.5	659
		32	40.0	11.2	448	16.0	640
		38	33.3	13.3	443	19.0	633
		44	28.6	15.4	440	22.0	629
		51	24.7	17.9	441	25.5	630
		64	19.4	22.4	435	32.0	619
		76	16.3	26.6	434	38.0	619
		89	13.9	31.2	433	44.5	619
		102	12.1	35.7	432	51.0	617
		115	10.8	40.3	435	57.5	621
		127	9.8	44.5	436	63.5	622
		139	8.9	48.7	433	69.5	619
		152	8.1	53.2	431	76.0	616
178	6.9	62.3	430	89.0	614		
b x h 5.4 x 2.2	305	4.0	106.8	427	152.5	610	

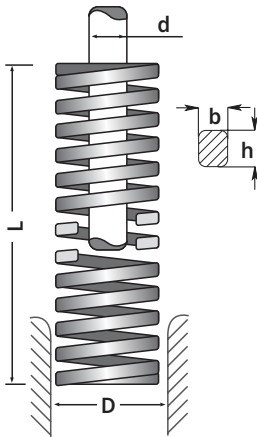
D	d	L	R	XXL 35 %		Max. 50 %	
				S1	F1	S2	F2
32	16	38	43.8	13.3	583	19.0	832
		44	37.5	15.4	578	22.0	825
		51	32.3	17.9	577	25.5	824
		64	25.4	22.4	569	32.0	813
		76	21.3	26.6	567	38.0	809
		89	18.1	31.2	564	44.5	805
		102	15.8	35.7	564	51.0	806
		115	13.9	40.3	559	57.5	799
		127	12.6	44.5	560	63.5	800
		139	11.4	48.7	555	69.5	792
40	20	152	10.5	53.2	559	76.0	798
		178	8.9	62.3	554	89.0	792
		203	7.8	71.1	554	101.5	792
		254	6.2	88.9	551	127	787
		305	5.2	106.8	555	152.5	793
		51	50.8	17.9	907	25.5	1295
		64	39.7	22.4	889	32.0	1270
		76	33.1	26.6	880	38.0	1258
		89	28.1	31.2	875	44.5	1250
		102	24.5	35.7	875	51.0	1250
50	25	115	21.6	40.3	869	57.5	1242
		127	19.5	44.5	867	63.5	1238
		139	17.8	48.7	866	69.5	1237
		152	16.3	53.2	867	76.0	1239
		178	13.8	62.3	860	89.0	1220
		203	12.1	71.1	860	101.5	1220
		254	9.7	88.9	862	127.0	1232
		305	8.0	106.8	854	152.5	1220
		64	80.2	22.4	1796	32.0	2566
		76	66.9	26.6	1780	38.0	2542
63	38	89	56.6	31.2	1763	44.5	2519
		102	49.3	35.7	1760	51.0	2514
		115	43.5	40.3	1751	57.5	2501
		127	39.3	44.5	1747	63.5	2496
		139	35.8	48.7	1742	69.5	2488
		152	32.8	53.2	1745	76.0	2493
		178	27.8	62.3	1732	89.0	2474
		203	24.2	71.1	1719	101.5	2456
		254	19.2	88.9	1707	127	2438
		305	16.0	106.8	1708	152.5	2440
63	38	76	87.8	26.6	1537	38.0	2196
		89	51.4	31.2	1601	44.5	2287
		102	44.4	35.7	1585	51.0	2264
		115	41.6	40.3	1674	57.5	2392
		127	33.2	44.5	1476	63.5	2108
		152	27.4	53.2	1458	76.0	2082
		178	24.0	62.3	1495	89.0	2136
		203	21.0	71.1	1492	101.5	2132
		254	16.4	88.9	1458	127	2083
		305	13.6	106.8	1452	152.5	2074

Springs



Code: **YY** Colour: **Green**

Light Load Spring
ISO 10243



D: Outer Diameter
d: Rod Diameter
b x h: Wire Section
L: Length
R: Load Rate (N)
XXL %: Long Life Deflection
Max %: Max. Working Deflection
S1: Deflection
F1: Load N
S2: Deflection
F2: Load N
N - Newton = (0.102) Kg
1kg = 9.81 N



Order:
YY. D x L

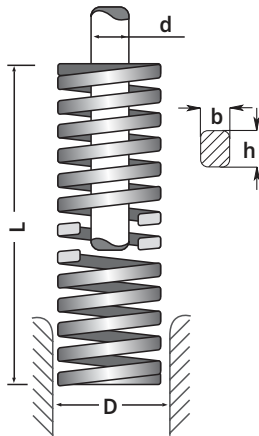
D	d	L	R	XLL 30 %		Max. 40 %		
				S1	F1	S2	F2	
10	5	25	11.0	7.5	83	10.0	110	
		32	8.5	9.6	82	12.8	109	
		38	6.8	11.4	78	15.2	103	
		44	6.0	13.2	79	17.6	106	
		51	5.0	15.3	77	20.4	102	
		64	4.1	19.2	79	25.6	105	
		76	3.6	22.8	82	30.4	109	
	b x h							
	1.7 x 1.1		305	0.9	91.5	82	122	110
13	6.3	25	21.0	7.5	158	10.0	210	
		32	16.4	9.6	157	12.8	210	
		38	13.6	11.4	155	15.2	207	
		44	12.1	13.2	160	17.6	213	
		51	10.3	15.3	158	20.4	210	
		64	7.6	19.2	146	25.6	195	
		76	6.3	22.8	144	30.4	192	
	89	5.4	26.7	144	35.6	192		
	b x h							
2.3 x 1.5		305	1.6	91.5	146	122	195	
16	8	25	29.0	7.5	218	10.0	290	
		32	22.9	9.6	220	12.8	293	
		38	19.3	11.4	220	15.2	293	
		44	17.1	13.2	226	17.6	301	
		51	14.0	15.3	214	20.4	286	
		64	10.7	19.2	205	25.6	274	
		76	9.0	22.8	205	30.4	274	
	89	7.3	26.7	195	35.6	260		
	102	6.8	30.6	208	40.8	277		
b x h								
3.2 x 1.7		305	2.3	91.5	210	122	281	
20	10	25	55.8	7.5	419	10.0	558	
		32	45.0	9.6	432	12.8	576	
		38	36.0	11.4	410	15.2	547	
		44	30.0	13.2	396	17.6	528	
		51	24.5	15.3	375	20.4	500	
		64	19.2	19.2	369	25.6	492	
		76	16.0	22.8	365	30.4	486	
		89	14.0	26.7	374	35.6	498	
		102	12.0	30.6	367	40.8	490	
		115	10.9	34.5	376	46.0	501	
		127	9.5	38.1	362	50.8	483	
	139	8.4	41.7	350	55.6	467		
	b x h							
4.0 x 2.1		305	4.0	91.5	366	122	488	
25	12.5	25	105	7.5	788	10.0	1050	
		32	80.3	9.6	771	12.8	1028	
		38	62.0	11.4	707	15.2	942	
		44	52.9	13.2	698	17.6	931	
		51	44.0	15.3	673	20.4	898	
		64	35.2	19.2	676	25.6	901	
		76	28.0	22.8	638	30.4	851	
		89	24.0	26.7	641	35.6	854	
		102	21.1	30.6	646	40.8	861	
		115	18.7	34.5	645	46.0	860	
		127	16.7	38.1	636	50.8	848	
	139	15.3	41.7	638	55.6	851		
	152	14.0	45.6	638	60.8	851		
178	12.5	53.4	668	71.2	890			
203	10.4	60.9	633	81.2	844			
b x h								
5.3 x 2.7		305	7.0	91.5	641	122	854	

D	d	L	R	XLL 30 %		Max. 40 %		
				S1	F1	S2	F2	
32	16	38	98.0	11.4	1117	15.2	1490	
		44	79.5	13.2	1049	17.6	1399	
		51	67.0	15.3	1025	20.4	1367	
		64	53.0	19.2	1018	25.6	1357	
		76	44.0	22.8	1003	30.4	1338	
		89	37.2	26.7	993	35.6	1324	
		102	32.0	30.6	979	40.8	1306	
		115	29.0	34.5	1001	46.0	1334	
		127	25.0	38.1	953	50.8	1270	
		139	23.0	41.7	959	55.6	1279	
		152	21.5	45.6	980	60.8	1307	
		178	18.2	53.4	972	71.2	1296	
		203	15.8	60.9	962	81.2	1283	
		b x h	254	12.5	76.2	953	101.6	1270
6.7 x 3.3	305	10.3	91.5	942	122	1257		
40	20	51	92.0	15.3	1408	20.4	1877	
		64	73.0	19.2	1402	25.6	1869	
		76	63.0	22.8	1436	30.4	1915	
		89	51.0	26.7	1362	35.6	1816	
		102	45.0	30.6	1377	40.8	1836	
		115	39.6	34.5	1366	46.0	1822	
		127	36.0	38.1	1372	50.8	1829	
		139	32.0	41.7	1334	55.6	1779	
		152	28.0	45.6	1277	60.8	1702	
		178	25.2	53.4	1346	71.2	1794	
		203	21.8	60.9	1328	81.2	1770	
		b x h	254	17.0	76.2	1295	101.6	1727
		8.0 x 4.0	305	14.8	91.5	1354	122	1806
		50	25	64	156	19.2	2995	25.6
76	125			22.8	2850	30.4	3800	
89	109			26.7	2910	35.6	3880	
102	94.0			30.6	2876	40.8	3835	
115	81.0			34.8	2795	46.0	3726	
127	71.0			38.1	2705	50.8	3607	
139	66.5			41.7	2773	55.6	3697	
152	60.0			45.6	2736	60.8	3648	
178	52.0			53.4	2777	71.2	3702	
203	44.0			60.9	2680	81.2	3573	
229	38.2			68.7	2624	91.6	3499	
b x h	254			35.0	76.2	2667	101.6	3556
11.1 x 5.5	305			28.5	91.5	2608	122.0	3477
63	38			76	189	22.8	4309	30.4
		89	158	26.7	4219	35.6	5625	
		102	131	30.6	4009	40.8	5345	
		115	116	34.5	4002	46.0	5336	
		127	103	38.1	3924	50.8	5232	
		152	84.3	45.6	3844	60.8	5125	
		178	71.5	53.4	3818	71.2	5091	
		203	61.7	60.9	3758	81.2	5010	
		b x h	254	47.0	76.2	3581	101.6	4775
		11.6 x 7.7	305	38.2	91.5	3495	122	4660



Code: **MY** Colour: **Blue**

Medium Load Spring
ISO 10243



D: Outer Diameter

d: Rod Diameter

b x h: Wire Section

L: Length

R: Load Rate (N)

XXL %: Long Life Deflection

Max %: Max. Working Deflection

S1: Deflection

F1: Load N

S2: Deflection

F2: Load N

N - Newton = (0.102) Kgf

1kg = 9.81 N



Order:
MY. D x L

D	d	L	R	XLL 25 %		Max. 37.5 %	
				S1	F1	S2	F2
10	5	25	16.0	6.3	100	9.4	150
		32	13.0	8.0	104	12.0	156
		38	11.9	9.5	113	14.3	170
		44	10.3	11.0	113	16.5	170
		51	8.9	12.8	113	19.1	170
		64	7.5	16.0	120	24.0	180
		76	6.2	19.0	118	28.5	177
		b x h 1.8 x 1.2	305	1.6	76.3	122	114.4
13	6.3	25	30.0	6.3	188	9.4	281
		32	24.8	8.0	198	12.0	298
		38	21.4	9.5	203	14.3	305
		44	18.0	11.0	198	16.5	297
		51	15.5	12.8	198	19.1	296
		64	12.1	16.0	194	24.0	290
		76	10.2	19.0	194	28.5	291
		89	8.4	22.3	187	33.4	280
b x h 2.5 x 1.7	102	7.1	25.5	181	38.3	272	
	305	2.4	76.3	183	114.4	275	
16	8	25	49.4	6.3	309	9.4	463
		32	38.5	8.0	308	12.0	462
		38	33.9	9.5	322	14.3	483
		44	30.0	11.0	330	16.5	495
		51	26.4	12.8	337	19.1	505
		64	20.5	16.0	328	24.0	492
		76	17.8	19.0	338	28.5	507
		89	15.2	22.3	338	33.4	507
		102	13.5	25.5	344	38.3	516
		b x h 3.2 x 2.0	115	12.0	28.8	345	43.1
305	4.3	76.3	328	114.4	492		
20	10	25	98.0	6.3	613	9.4	919
		32	72.6	8.0	581	12	871
		38	56.0	9.5	532	14.3	798
		44	47.5	11.0	523	16.5	784
		51	41.7	12.8	5321	19.1	798
		64	32.3	16.0	517	24.0	775
		76	25.1	19.0	477	28.5	715
		89	22.0	22.3	490	33.4	734
		102	19.8	25.5	505	38.3	757
		115	18.1	28.8	520	43.1	781
		127	16.6	31.8	527	47.6	791
		139	15.1	34.8	525	52.1	787
b x h 4.0 x 2.4	152	13.2	38.0	502	57.0	752	
	305	6.1	76.3	465	114.4	698	
25	12.5	25	157	6.2	981	9.4	1472
		32	118	8.0	944	12.0	1416
		38	93.0	9.5	884	14.3	1325
		44	80.8	11.0	889	16.5	1333
		51	68.6	12.8	875	19.1	1312
		64	53.0	16.0	848	24	1272
		76	43.2	19.0	821	28.5	1231
		89	38.2	22.3	850	33.4	1275
		102	33	25.5	842	38.3	1262
		115	28	28.8	805	43.1	1208
		127	25.9	31.8	822	47.6	1233
		139	23.2	34.8	806	52.1	1209
		152	20.8	38.0	790	57.0	1186
		178	17.8	44.5	792	66.8	1188
b x h 5.3 x 3.1	203	15.8	50.8	802	76.1	1203	
305	10.2	76.3	778	114.4	1167		

D	d	L	R	XXL 25 %		Max. 37.5 %	
				S1	F1	S2	F2
32	16	38	185	9.5	1758	14.3	2636
		44	158	11	1738	16.5	2607
		51	134	12.8	1709	19.1	2563
		64	99	16	1584	24	2376
		76	80.5	19	1530	28.5	2294
		89	69.1	22.3	1537	33.4	2306
		102	58.8	25.5	1499	38.3	2249
		115	51.5	28.8	1481	43.1	2221
		127	44.8	31.8	1422	47.6	2134
		139	42.3	34.8	1470	52.1	2205
40	20	152	37.8	38	1436	57	2155
		178	32.5	44.5	1446	66.8	2169
		203	28.9	50.8	1467	76.1	2200
		254	22.2	63.5	1410	95.3	2115
		305	18.3	76.3	1395	114.4	2093
		51	181.6	12.8	2315	19.1	3473
		64	140	16	2240	24	3360
		76	108	19	2052	28.5	3078
		89	90.7	22.3	2018	33.4	3027
		102	81	25.5	2066	38.3	3098
50	25	115	71.8	28.8	2064	43.1	3096
		127	62.7	31.8	1991	47.6	2986
		139	57.5	34.8	1998	52.1	2997
		152	51.6	38	1961	57	2941
		160	47.5	40	1900	60	2850
		178	44.1	44.5	1962	66.8	2944
		203	36.7	50.8	1863	76.1	2794
		254	30.1	63.5	1911	95.3	2867
		305	24.6	76.3	1876	114.4	2814
		64	209	16	3344	24	5016
63	38	76	168	19	3192	28.5	4788
		89	140	22.3	3115	33.4	4673
		102	119	25.5	3035	38.3	4552
		115	106	28.8	3048	43.1	4571
		127	97	31.8	3080	47.6	4620
		139	87	34.8	3023	52.1	4535
		152	80	38	3040	57	4560
		160	76	40	3040	60	4560
		178	69.5	44.5	3093	66.8	4639
		203	59.8	50.8	3035	76.1	4552
80	50	229	50.9	57.3	2914	85.9	4371
		254	46.0	63.5	2921	95.3	4382
		305	38.6	76.3	2943	114.4	4415
		76	320	19	6080	28.5	9120
		89	260	22.3	5785	33.4	8687
		102	221	25.5	5636	38.3	8453
		115	187	28.8	5376	43.1	8064
		127	168	31.8	5334	47.6	8001
		152	136	38	5168	57	7752
		160	128	40	5120	60	7680
100	63	178	114	44.5	5073	66.8	7610
		203	100	50.8	5075	76.1	7613
		229	89.2	57.3	5107	85.9	7660
		254	78.4	63.5	4978	95.3	7468
		305	64.7	76.3	4933	114.4	7400
		315	52.8	78.8	4946	118.1	7418
		400	48.5	100	4850	150	7275
		64	209	16	3344	24	5016
		76	168	19	3192	28.5	4788
		89	140	22.3	3115	33.4	4673

Springs

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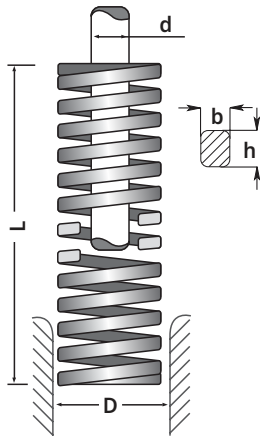
18

Springs



Code: KY Colour: Red

Heavy Load Spring
ISO 10243



D: Outer Diameter

d: Rod Diameter

b x h: Wire Section

L: Length

R: Load Rate (N)

XXL %: Long Life Deflection

Max %: Max. Working Deflection

S1: Deflection

F1: Load N

S2: Deflection

F2: Load N

N - Newton = (0.102) Kgf

1kg = 9.81 N



Order:
KY. D x L

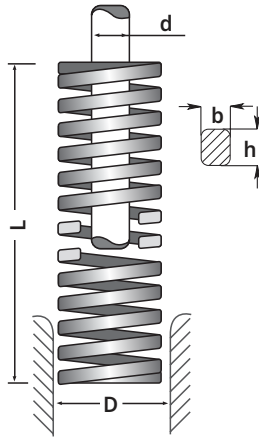
D	d	L	R	XLL 20 %		Max. 30 %	
				S1	F1	S2	F2
10	5	25	23	5.0	115	7.5	173
		32	17.5	6.4	112	9.6	168
		38	14.8	7.6	112	11.4	169
		44	13	8.8	114	13.2	172
		51	11.2	10.2	114	15.3	171
		64	9.2	12.8	118	19.2	177
		76	7.5	15.2	114	22.8	171
	b x h						
1.8 x 1.4		305	1.9	61.0	116	91.5	174
13	6.3	25	42.1	5.0	211	7.5	316
		32	33.2	6.4	212	9.6	319
		38	29.3	7.6	223	11.4	334
		44	24.6	8.8	216	13.2	325
		51	19.6	10.2	200	15.3	300
		64	15.0	12.8	192	19.2	288
		76	13.2	15.2	20	22.8	301
	89	11.4	17.8	203	26.7	304	
b x h		102	9.4	20.4	192	30.6	288
2.4 x 2.0		305	3.2	61.0	195	91.5	293
16	8	25	75.7	5.0	379	7.5	568
		32	60.2	6.4	385	9.6	578
		38	50.8	7.6	386	11.4	579
		44	42.8	8.8	377	13.2	565
		51	37.1	10.2	378	15.3	568
		64	30.3	12.8	388	19.2	582
		76	25.8	15.2	392	22.8	588
	89	21.7	17.8	386	26.7	573	
102	18.9	20.4	386	30.6	578		
b x h		115	17.0	23.0	391	34.5	587
3.0 x 2.4		305	6.3	61.0	384	91.5	576
20	10	25	216	5.0	1080	7.5	1620
		32	168	6.4	1075	9.6	1613
		38	129	7.6	980	11.4	1471
		44	112	8.8	986	13.2	1478
		51	97	10.21	959	15.3	1438
		64	72.1	12.8	923	19.2	1384
		76	59.7	15.2	907	22.8	1361
		89	50.5	17.8	899	26.7	1348
		102	44.2	20.4	902	30.6	1353
		115	38.4	23.0	883	34.5	1325
		127	34.1	25.4	866	38.1	1299
	139	31.0	27.8	862	41.7	1293	
152	28.2	30.4	857	45.6	1286		
b x h		305	14.0	61	854	91.5	1281
4.0 x 3.2		305	14.0	61	854	91.5	1281
25	12.5	25	375	5.0	1875	7.5	2813
		32	297	6.4	1901	9.6	2851
		38	219	7.6	1664	11.4	2497
		44	187	8.8	1646	13.2	2468
		51	156	10.2	1591	15.3	2387
		64	123	12.8	1574	19.2	2362
		76	99	15.2	1505	22.8	2257
		89	84	17.8	1495	26.7	2243
		102	73	20.4	1489	30.6	2234
		115	65	23	1495	34.5	2243
		127	57.7	25.4	1466	38.1	2198
		139	52.7	27.8	1465	41.7	2198
		152	47.8	30.4	1453	45.6	2180
	178	41	35.6	1460	53.4	2189	
203	35.8	40.6	1453	60.9	2180		
b x h		305	22.9	61	1397	91.5	2095
5.6 x 4.1		305	22.9	61	1397	91.5	2095

D	d	L	R	XLL 20 %		Max. 30 %			
				S1	F1	S2	F2		
32	16	38	388	7.6	2949	11.4	4423		
		44	324	8.8	2851	13.2	4277		
		51	272	10.2	2774	15.3	4162		
		64	212	12.8	2714	19.2	4070		
		76	172	15.2	2614	22.8	3922		
		89	141	17.8	2510	26.7	3765		
		102	122	20.4	2489	30.6	3733		
		115	107	23	2461	34.5	3692		
		127	93	25.4	2362	38.1	3543		
		139	86	27.8	2391	41.7	3586		
		152	78	30.4	2371	45.6	3557		
		178	67.2	35.6	2392	53.4	3588		
		203	59.1	40.6	2399	60.9	3599		
		b x h	254	46.4	50.8	2357	76.2	3536	
6.9 x 5.3	305	38	61	2318	91.5	3477			
40	20	51	350	10.2	3570	15.3	5355		
		64	269	12.8	3443	19.2	5165		
		76	219	15.2	3329	22.8	4993		
		89	190	17.8	3382	26.7	5073		
		102	163	20.4	3325	30.6	4988		
		115	142	23	3266	34.5	4899		
		127	128	25.4	3251	38.1	4877		
		139	115	27.8	3197	41.7	4796		
		152	105	30.4	3192	45.6	4788		
		178	89	35.6	3168	53.4	4753		
		203	77	40.6	3126	60.9	4689		
		b x h	254	61	50.8	3099	76.2	4648	
		8.4 x 6.2	305	51	61.0	3111	91.5	4667	
		50	25	64	413	12.8	5286	19.2	7930
76	339			15.2	5153	22.8	7729		
89	288			17.8	5126	26.7	7690		
102	245			20.4	4998	30.6	7497		
115	215			23	4945	34.5	7418		
127	192			25.4	4877	38.1	7315		
139	168			27.8	4670	41.7	7006		
152	154			30.4	4682	45.6	7022		
178	134			35.6	4770	53.4	7156		
203	117			40.6	4750	60.9	7125		
b x h	254			89	50.8	4521	76.2	6782	
11.3 x 7.4	305			73	61	4453	91.5	6680	
63	38			76	630	15.2	9576	22.8	14364
				89	485	17.8	8633	26.7	12950
		102	434	20.4	8854	30.6	13280		
		115	384	23	8832	34.5	13248		
		127	349	25.4	8865	38.1	13297		
		152	276	30.4	8390	45.6	12586		
		178	237	35.6	8437	53.4	12656		
		203	210	40.6	8526	60.9	12789		
		b x h	254	165	50.8	8382	76.2	12573	
		11.2 x 12.9	305	134	61	8174	91.5	12261	



Code: **SY** Colour: **Yellow**

Extra Heavy Load Spring
ISO 10243



D: Outer Diameter

d: Rod Diameter

b x h: Wire Section

L: Length

R: Load Rate (N)

XXL %: Long Life Deflection

Max %: Max. Working Deflection

S1: Deflection

F1: Load N

S2: Deflection

F2: Load N

N - Newton = (0.102) Kgf

1kg = 9.81 N



Order:
SY. D x L

D	d	L	R	XLL 17 %		Max. 25 %	
				S1	F1	S2	F2
10	5	25	36.8	4.3	156	6.3	230
		32	27.9	5.4	152	8.0	223
		38	23.7	6.5	153	9.5	225
		44	19.2	7.5	144	11.0	211
		51	16.5	8.7	143	12.8	210
		64	13.2	10.9	144	16	211
		76	10.9	12.9	141	19	207
		b x h 1.9 x 1.5	305	2.6	51.9	135	76.3
13	6.3	25	58.5	4.3	249	6.3	366
		32	43.9	5.4	239	8.0	351
		38	36.0	6.5	233	9.5	342
		44	30.3	7.5	227	11.0	333
		51	26.2	8.7	227	12.8	334
		64	21.2	10.9	231	16	339
		76	17.1	12.9	221	19	325
		89	14.5	15.1	219	22.3	323
b x h 2.3 x 2.2	102	12.5	17.3	217	25.5	319	
305	4.3	51.9	223	76.3	328		
16	8	25	118	4.3	502	6.3	738
		32	89	5.4	484	8.0	712
		38	72.1	6.5	466	9.5	685
		44	60.9	7.5	456	11.0	670
		51	52.3	8.7	453	12.8	667
		64	41.2	10.9	448	16	659
		76	34.1	12.9	441	19	648
		89	29.5	15.1	446	22.3	656
b x h 3.2 x 2.7	102	25.6	17.3	444	25.5	653	
305	8.4	51.9	436	76.3	641		
20	10	25	293	4.3	1245	6.3	1831
		32	224	5.4	1219	8.0	1792
		38	177	6.5	1143	9.5	1682
		44	149	7.5	1115	11	1639
		51	128	8.7	1110	12.8	1632
		64	99	10.9	1077	16	1584
		76	81.7	12.9	1056	19	1552
		89	69.5	15.1	1052	22.3	1546
		102	60.6	17.3	1051	25.5	1545
		115	53	19.6	1036	28.8	1524
		127	47.5	21.6	1026	31.8	1508
		139	43	23.6	1016	34.8	1494
b x h 4.1 x 3.7	152	39	25.8	1008	38	1482	
305	20	51.9	1037	76.3	1525		
25	12.5	25	488	4.3	2098	6.3	3074
		32	374.4	5.4	2037	8	2995
		38	346	6.5	2235	9.5	3287
		44	244	7.5	1825	11	2684
		51	207.5	8.7	1799	12.8	2646
		64	161	10.9	1752	16	2576
		76	130.8	12.9	1690	19	2485
		89	110.5	15.1	1672	22.3	2459
		102	96.3	17.3	1670	25.5	2456
		115	85.7	19.6	1675	28.8	2464
		127	76.3	21.6	1647	31.8	2423
		139	69.5	23.6	1642	34.8	2415
b x h 5.6 x 4.6	152	63.5	25.8	1641	38	2413	
305	53.9	30.3	1631	44.5	2399		
305	47.0	34.5	1622	50.8	2385		
305	30.9	51.9	1602	76.3	2350		

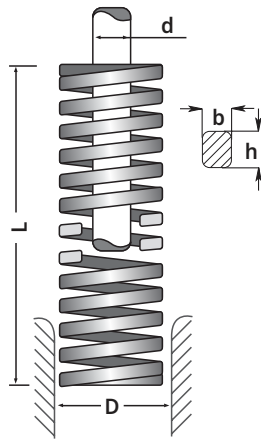
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Springs



Code: **GY** Colour: **Brown**

Ultra Heavy Load Spring



D: Outer Diameter
d: Rod Diameter
b x h: Wire Section
L: Length
R: Load Rate (N)
XXL %: Long Life Deflection
Max %: Max. Working Deflection
S1: Deflection
F1: Load N
S2: Deflection
F2: Load N
N - Newton = (0.102) Kgf
1kg = 9.81 N



Order:
GY. D x L

D	d	L	R	XLL 10 %		Max. 15 %	
				S1	F1	S2	F2
10	5	25	167	2.5	418	3.8	626
		32	130	3.2	416	4.8	624
		38	105	3.8	399	5.7	599
		44	86	4.4	378	6.6	568
		51	76	5.1	403	7.7	604
		64	62	6.4	397	9.6	595
b x h 2.2 x 2.7		76	51	7.6	388	11.4	581
13	6.3	25	288	2.5	720	3.8	1080
		32	216	3.2	691	4.8	1037
		38	176	3.8	669	5.7	1003
		44	149	4.4	646	6.6	983
		51	128	5.1	653	7.7	979
		64	100	6.4	640	9.6	960
		76	84	7.6	638	11.4	958
		89	71	8.9	632	13.4	948
b x h 2.8 x 3.4		102	61	10.2	622	15.3	933
16	8	32	449	3.2	1437	4.8	2155
		38	363	3.8	1379	5.7	2069
		44	309	4.4	1360	6.6	2039
		51	256	5.1	1306	7.7	1959
		64	203	6.4	1299	9.6	1949
		76	166	7.6	1262	11.4	1892
		89	139	8.9	1237	13.4	1856
		102	114	10.2	1163	15.3	1744
		115	105	11.5	1208	17.3	1811
		127	94	12.7	1194	19.1	1791
		152	69	15.2	1049	22.8	1573
		b x h 3.5 x 4.6		305	37	30.5	1129
20	10	44	452	4.4	1989	6.6	2983
		51	378	5.1	1928	7.7	2892
		64	301	6.4	1926	9.6	2890
		76	247	7.6	1877	11.4	2816
		89	208	8.9	1851	13.4	2777
		102	188	10.2	1918	15.3	2876
		115	159	11.5	1829	17.3	2743
		127	146	12.7	1854	19.1	2781
		152	121	15.2	1839	22.8	2749
		b x h 4.1 x 5.9		305	60	30.5	1830
25	12.5	44	1158	4.4	5095	6.6	7643
		51	933	5.1	4758	7.7	7137
		64	730	6.4	4672	9.6	7008
		76	556	7.6	4226	11.4	6338
		89	462	8.9	4112	13.4	6168
		102	390	10.2	3978	15.3	5967
		115	360	11.5	4140	17.3	6210
		127	325	12.7	4140	19.1	6210
		152	255	15.2	3876	22.8	5814
		178	230	17.8	4094	26.7	6141
		203	202	20.3	4101	30.5	6151
		b x h 5.7 x 7.4		305	136	30.5	4148

D	d	L	R	XLL 10 %		Max. 15 %		
				S1	F1	S2	F2	
32	16	44	1300	4.4	5720	6.6	8580	
		51	1150	5.1	5865	7.7	8798	
		64	887	6.4	5677	9.6	8515	
		76	733	7.6	5571	11.4	8356	
		89	612	8.9	5447	13.4	8170	
		102	544	10.2	5549	15.3	8323	
		115	494	11.5	5681	17.3	8522	
		127	432	12.7	5486	19.1	8230	
		152	356	15.2	5411	22.8	8117	
		178	304	17.8	5411	26.7	8117	
		203	265	20.3	5380	30.5	8069	
		254	214	25.4	5436	38.1	8153	
b x h 7.4 x 8.8	305	177	30.5	5399	45.8	8098		
40	20	64	1228	6.4	7859	9.6	11789	
		76	1017	7.6	7729	11.4	11594	
		89	880	8.9	7832	13.4	11748	
		102	762	10.2	7772	15.3	11659	
		115	679	11.5	7809	17.3	11716	
		127	622	12.7	7899	19.1	11849	
		152	509	15.2	7737	22.8	11605	
		178	429	17.8	7636	26.7	11454	
		203	374	20.3	7592	30.5	11388	
		254	296	25.4	7518	38.1	11278	
		b x h 8.4 x 10.9	305	246	30.5	7503	45.8	11255
		50	25	64	1980	6.4	12672	9.6
76	1811			7.6	13764	11.4	20645	
89	1410			8.9	12549	13.4	18824	
102	1215			10.2	12393	15.3	18590	
115	1076			11.5	12374	17.3	18561	
127	968			12.7	12294	19.1	18440	
152	806			15.2	12251	22.8	18377	
178	698			17.8	12424	26.7	18637	
203	612			20.3	12424	30.5	18635	
254	472			25.4	11989	38.1	17983	
b x h 11.8 x 13.4	305			388	30.5	11834	45.8	17751
63	38			89	1560	10.0	15600	17.4
		102	1298	12.0	15576	20.9	27128	
		115	1078	14.1	15200	25.2	27166	
		127	970	15.7	15229	28	27160	
		152	801	18.9	15139	33.9	27154	
		178	655	23.4	15327	41.4	27117	
		203	552	27.0	14904	49	27048	
		254	423	35.0	14805	64	27072	
		b x h 11.8 x 17.8	305	349	42.5	14833	77.5	27048
		In the GY series diameter 63 mm, XLL % and Max % are different from the standard (10% and 15%) fixed for the other diameters						

In the GY series diameter 63 mm, XLL % and Max % are different from the standard (10% and 15%) fixed for the other diameters



NEW

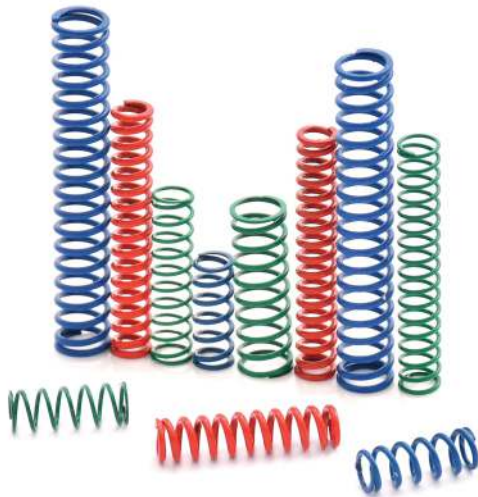
Small Series

Tolerances:

"R" $\pm 10\%$ "D" ± 0.5 mm

Material:

UNI EN 10270-1 SH



The small springs in this catalogue are made from round crosssection wire and are subdivided in three series. Each series has its own colour which allows easy identification. We make the pressing to solid also on these springs to avoid considerable settlements when the springs work.

D: Outer Diameter
d: Rod Diameter
L: Length
R: Load Rate (N)
S - Max: Stroke
F - Max: Load N



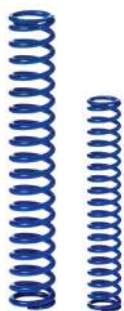
Small Series Green



Light Load Spring - Round Wire

Code: **TVY**

Order Code	D	d	L	R	S - Max	F - Max
TVY 0616	6	4.7	16	1.60	10	16
TVY 0625			25	0.86	15	13
TVY 0638			38	0.64	23	15
TVY 0651	wire section 0.6 mm		51	0.38	31	12
TVY 0816	8	6.2	16	2.40	9	22
TVY 0825			25	1.30	14	18
TVY 0838			38	0.82	21	17
TVY 0851	wire section 0.8 mm		51	0.56	28	16



Small Series Blue



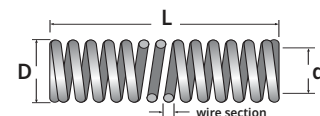
Medium Load Spring - Round Wire

Code: **TBM**

Order Code	D	d	L	R	S - Max	F - Max
TBM 0616	6	4.2	16	5.20	8.5	44
TBM 0625			25	3.06	13	40
TBM 0638			38	1.86	20	37
TBM 0651	wire section 0.8 mm		51	1.56	27	45
TBM 0816	8	5.8	16	7.23	9	65
TBM 0825			25	3.90	13	51
TBM 0838			38	2.36	20	47
TBM 0851	wire section 1 mm		51	1.64	26	43



Small Series Red



Heavy Load Spring - Round Wire

Code: **TRK**

Order Code	D	d	L	R	S - Max	F - Max
TRK 0616	6	3.9	16	12.78	8	102
TRK 0625			25	6.26	12	75
TRK 0638			38	5.0	19	95
TRK 0651	wire section 1 mm		51	3.64	25	91
TRK 0816	8	5.5	16	16.94	8	136
TRK 0825			25	10.02	11	110
TRK 0838			38	6.24	17	106
TRK 0851	wire section 1.2 mm		51	4.36	22	96

Springs

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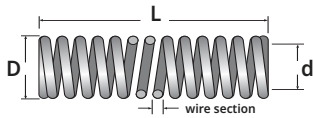
Springs

Green



Light Load Spring
Round Wire

Code: TVY



D	d	L	R	XLL 30 %		Max. 40 %	
				S1	F1	S2	F2
10	5	25	4.4	6.3	28	10.0	44
		32	3.4	8.0	27	12.8	44
		38	2.8	9.5	27	15.2	43
		44	2.4	11.0	26	17.6	42
		51	2.1	12.8	27	20.4	43
		64	1.6	16.0	26	25.6	41
		76	1.3	19.0	25	30.4	40
		1.1 mm	305	0.3	76.3	23	122
- wire section							
13	6.3	25	8.5	6.3	54	10.0	85
		32	6.5	8.0	52	12.8	83
		38	5.3	9.5	50	15.2	81
		44	4.4	11.0	48	17.6	77
		51	3.8	12.8	49	20.4	78
		64	2.9	16.0	46	25.6	74
		76	2.5	19.0	48	30.4	76
		89	2.1	22.3	47	35.6	75
- wire section							
16	8	305	0.6	76.3	46	122	73
		25	17.9	6.3	113	10.0	179
		32	13.5	8.0	108	12.8	173
		38	10.5	9.5	100	15.2	160
		44	8.8	11.0	97	17.6	155
		51	7.6	12.8	97	20.4	155
		64	5.9	16.0	94	25.6	151
		76	4.8	19.0	91	30.4	146
- wire section							
18	10.2	89	4.0	22.3	89	35.6	142
		102	3.5	25.5	89	40.8	143
		305	1.1	76.3	84	122	134
- wire section							



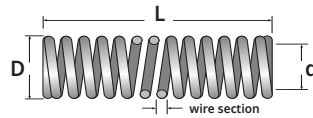
Order:
TVY. D x L

Blue



Medium Load Spring
Round Wire

Code: TBM



D	d	L	R	XLL 30 %		Max. 40 %	
				S1	F1	S2	F2
10	5	25	12.3	6.3	77	9.4	115
		32	9.5	8.0	76	12.01	114
		38	7.8	9.5	74	14.3	111
		44	6.5	11.0	72	16.5	107
		51	5.6	12.8	71	19.1	107
		64	4.5	16.0	72	24.0	108
		76	3.7	19.0	70	28.5	105
		wire section 1.5	305	0.9	76.3	69	114.4
13	6.3	25	6.3	6.3	136	9.4	203
		32	8.0	8.0	134	12.0	202
		38	9.5	9.5	131	14.3	197
		44	11.0	11.0	128	16.5	191
		51	12.8	12.8	128	19.1	191
		64	16.0	16.0	125	24.0	187
		76	19.0	19.0	122	28.5	182
		wire section 1.8	89	22.3	22.3	125	33.4
16	8	305	76.3	76.3	114	114.4	172
		25	6.3	6.3	199	9.4	299
		32	8.0	8.0	192	12.0	288
		38	9.5	9.5	184	14.3	276
		44	11.0	11.0	177	16.5	266
		51	12.8	12.8	176	19.1	264
		64	16.0	16.0	171	24.0	257
		76	19.0	19.0	167	28.5	251
		89	22.3	22.3	167	33.4	250
		wire section 2.2	102	25.5	25.5	166	38.3
305	76.3	76.3	160	114.4	240		



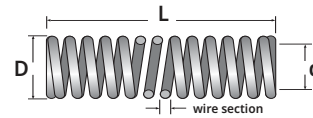
Order:
TBM. D x L

Red



Heavy Load Spring
Round Wire

Code: TRK



D	d	L	R	XLL 30 %		Max. 40 %	
				S1	F1	S2	F2
10	5	25	20.7	5.0	104	7.5	155
		32	16.1	6.4	103	9.6	155
		38	13.0	7.6	99	11.4	148
		44	10.9	8.8	96	13.2	144
		51	9.6	10.2	98	15.3	147
		64	7.7	12.8	99	19.2	147
		76	6.3	15.2	96	22.8	144
		1.6	305	1.5	61.0	92	91.5
13	6.3	25	37.5	5.0	188	7.5	281
		32	28.9	6.4	185	9.6	277
		38	23.5	7.6	179	11.4	268
		44	19.6	8.8	172	13.2	259
		51	17.3	10.2	176	15.3	265
		64	13.5	12.8	173	19.2	259
		76	11.2	15.2	170	22.8	255
		2.1	89	9.5	17.8	169	26.7
16	8	305	2.7	61.0	165	91.5	247
		25	81.6	5.0	404	7.5	612
		32	61.3	6.4	392	9.6	588
		38	49.9	7.6	379	11.4	569
		44	40.8	8.8	359	13.2	539
		51	35.6	10.2	363	15.3	545
		64	27.8	12.8	356	19.2	534
		76	22.8	15.2	347	22.8	520
18	10.2	89	19.6	17.8	349	26.7	523
		102	17.0	20.4	347	30.6	520
		305	5.4	61.0	329	91.5	494



Order:
TRK. D x L



D: Outer Diameter

L: Length

XXL %: Long Life Deflection

S1: Deflection

S2: Deflection

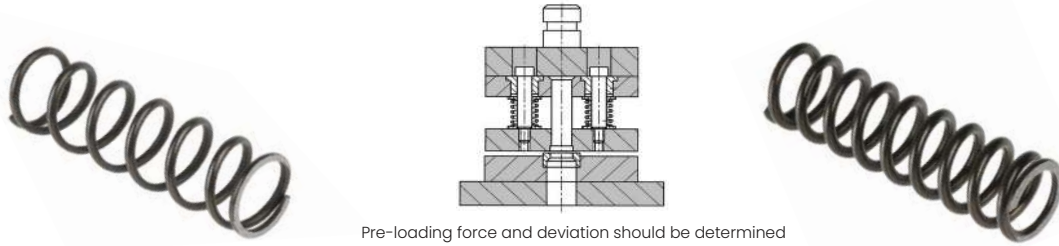
d: Rod Diameter

R: Load Rate (N)

Max %: Max. Working Deflection

F1: Load N

F2: Load N

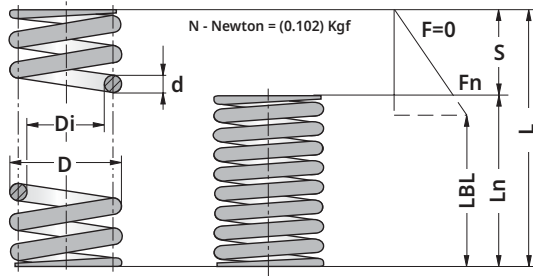


Pre-loading force and deviation should be determined by the designer. Initially, 5 mm pre-loading should be applied.

Round Wire Compression Spring

Code: **YYH**

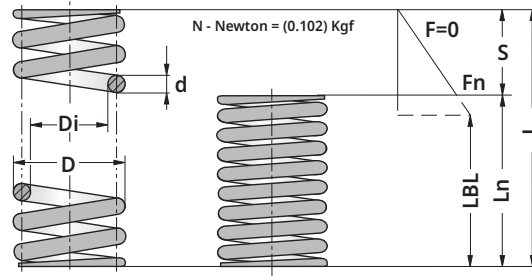
Light Duty & High Stroke



Round Wire Compression Spring

Code: **YYS**

Standard Performance



D: Average outer diameter / **Di:** Slot diameter / **d:** Spring wire diameter / **S:** Total clamping / **L:** Free length / **Ln:** Length at load

LBL: Closed spring length / **F:** Force / Newton / **Fn:** Pressure force

D	L	Di	d	S	Fn	Ln	LBL
10	40	7.0	1.5	18.9	148	21.1	18.0
12	55	9.0	1.5	30.0	103	25.0	22.0
14	40	10.0	2.0	19.1	243	20.9	18.0
14	50	10.0	2.0	24.0	228	26.0	23.0
15	40	11.0	2.0	19.5	221	20.5	16.0
15	100	11.0	2.0	58.5	245	41.5	39.0
17	85	12.5	2.25	41.0	265	44.0	32.0
17.5	45	11.5	3.0	13.0	422	32.0	30.0
17.5	50	11.5	3.0	15.0	434	35.0	33.0
18	83	10	4.0	18.0	1198	65.0	62.0
19	35	11	4.0	5.0	697	30.0	28.0
19	90	10	4.50	17.0	1669	73.0	70.0
19.5	35	14.5	2.50	14.0	186	21.0	19.0
19.5	40	13.5	3.0	14.0	398	36.0	24.0
20.5	95	15.5	2.50	54.0	262	41.0	39.0
21	40	13	4.0	11.0	1148	29.0	27.0
21.5	45	15.5	3.0	20.0	436	25.0	23.0
21.5	50	13.5	4.0	15.0	1099	35.0	32.0
22	45	16	3.0	21.7	387	23.3	19.5
22	70	16	3.0	29.4	387	40.6	28.5
22	100	16	3.0	38.7	387	61.3	40.5
23	130	16	3.5	43.4	579	86.6	59.5
23	160	16	3.5	54.6	579	105.4	73.3
23	190	16	3.5	64.8	579	125.2	86.0
24	220	16	4.0	62.4	765	157.6	112.0
24	250	16	4.0	71.6	765	178.4	128.0
25	24	17	4.0	7.00	790	17.0	16.0
27.8	70	13.8	7.0	8.00	3014	62.0	62.0
30	70	22.0	4.0	32.5	739	37.5	32.0
30	150	17.0	6.5	34.0	3142	116.0	107.0



Order:
YYH. D x L

Material:
Spring Steel, Hardened.



Order:
YYS. D x L

Material:
Spring Steel, Hardened.

These springs from spring steel as winding / with high tension heat treated are used in table data standards **DIN 2095** or optionally both inactive and oscillatory loads. Optionally, they can be used in cases that are posed due to severe, hard impacts and vibrant load or when there are high expectations from spring life. Both types have flattened, forged coils and their surface are homogenized with shot blasting process. All springs are supplied as lubricated. All these springs can be produced in the desired lengths and diameters. **Maximum working temperature: 200°C.**

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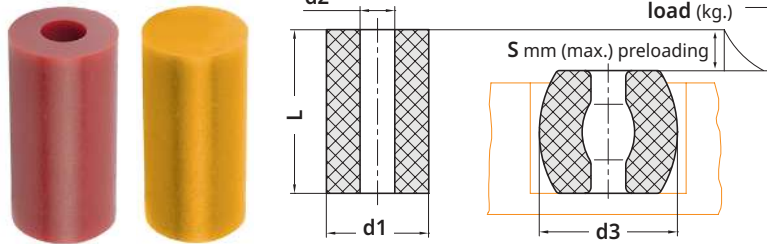
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Polyurethane Compression Spring

90 SHORE / Red Springs

Code: **PMK**

Compression (Length)

Red 25% Yellow 35%

80 SHORE / Yellow Springs

Code: **PMS**

● D = Solid ○ B = Hollow

d1	L	d2	d3	25%		35%		d1	L	d2	d3	25%		35%	
				Max. Force								Max. Force			
				S	F	S	F					S	F	S	F
16	12	6.5	21	3.6	171	4.3	104	63	32	17	81	9.6	3070	11.2	1902
	16			4.8	169	5.6	100		40			12.0	3009	14.0	1836
	20			6.0	165	7.0	97		50			15.0	2947	17.5	1785
	25			7.5	161	8.7	96		63			18.9	2856	22.0	1734
20	16	8.5	26	4.8	265	5.6	156		80			24.0	2805	28.0	1683
	20			6.0	260	7.0	154		100			30.0	2784	35.0	1652
	25			7.5	258	8.7	153	125	37.5	2733	43.7	1632			
	32			9.6	255	10.6	152	32	9.6	5406	11.2	3213			
25	20	10.5	32	6.0	439	7.0	265	40	12.0	5151	14.0	3070			
	25			7.5	428	8.7	260	50	15.0	4896	17.5	3049			
	32			9.6	423	10.6	257	63	18.9	4743	22.0	2937			
	40			12.0	420	14.0	255	80	24.0	4641	28.0	2886			
32	32	13.5	42	9.6	653	10.6	398	100	30.0	4579	35.0	2866			
	40			12.0	648	14.0	393	125	37.5	4488	43.7	2861			
	50			15.0	643	17.5	390	32	9.6	9180	11.2	5712			
	63			18.9	638	22.0	388	40	12.0	8649	14.0	5304			
40	32	13.5	52	9.6	1122	10.6	683	50	15.0	8262	17.5	5100			
	40			12.0	1112	14.0	673	63	18.9	7956	22.0	4845			
	50			15.0	1101	17.5	668	80	24.0	7650	28.0	4590			
	63			18.9	1097	22.0	663	100	30.0	7446	35.0	4416			
50	32	17	65	9.6	1775	10.6	1102	125	37.5	7242	43.7	4233			
	40			12.0	1765	14.0	1061	32	9.6	15300	11.2	9384			
	50			15.0	1734	17.5	1041	40	12.0	14535	14.0	8670			
	63			18.9	1698	22.0	1020	50	15.0	13464	17.5	8160			
63	32	17	81	9.6	2856	11.2	1902	63	18.9	12750	22.0	7650			
	40			12.0	3009	14.0	1836	80	24.0	12036	28.0	7242			
	50			15.0	2947	17.5	1785	100	30.0	11730	35.0	7191			
	63			18.9	2856	22.0	1734	125	37.5	11526	43.7	7140			
80	32	21	104	9.6	5406	11.2	3213	160	48.0	11352	56.0	6936			
	40			12.0	5151	14.0	3070	32	9.6	9180	11.2	5712			
	50			15.0	4896	17.5	3049	40	12.0	8649	14.0	5304			
	63			18.9	4743	22.0	2937	50	15.0	8262	17.5	5100			
100	32	21	130	9.6	9180	11.2	5712	63	18.9	7956	22.0	4845			
	40			12.0	8649	14.0	5304	80	24.0	7650	28.0	4590			
	50			15.0	8262	17.5	5100	100	30.0	7446	35.0	4416			
	63			18.9	7956	22.0	4845	125	37.5	7242	43.7	4233			
125	32	27	160	9.6	15300	11.2	9384	32	9.6	15300	11.2	9384			
	40			12.0	14535	14.0	8670	40	12.0	14535	14.0	8670			
	50			15.0	13464	17.5	8160	50	15.0	13464	17.5	8160			
	63			18.9	12750	22.0	7650	63	18.9	12750	22.0	7650			
160	32	27	160	9.6	15300	11.2	9384	80	24.0	12036	28.0	7242			
	40			12.0	14535	14.0	8670	100	30.0	11730	35.0	7191			
	50			15.0	13464	17.5	8160	125	37.5	11526	43.7	7140			
	63			18.9	12750	22.0	7650	160	48.0	11352	56.0	6936			



Order:

Code. **D** or **B** x d1 x L

Order Example:

PMS. B x 25 x 40



Plates - Cylinder - Discs - Pipes - Square - Formed Moulding

In special forms are produced as per request!

They do not create any problem at water / oil emulsions (resistance to thermal shock). They do not have any abrasion effects that can be distinguished with fixed and high load under normal temperature and environmental conditions at serial motion dies. Especially, they are efficient in ambient that do not require magnetization. Polyurethane springs can be machining with ordinary machine tools (such as lathe) as well as can be machining with traditional cutting tools (with sharp cutting edge). Polyurethane compression spring is incompressible material, spring load is obtained by extending outwards. Most of the expansion is reflected outwards. When desired higher flexion, selected spring is cut into two pieces from centre, then metal thick washer is inserted, thus flexion is increased two times. Pin diameter of polyurethane compression springs should be less than the inner diameter of spring.



90 SHORE

Code: **PRPK**



80 SHORE

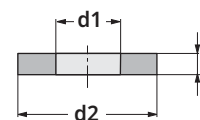
Code: **PRPS**

Polyurethane Shock Absorbing Washer

Compression (Length)

Red 25%

Yellow 35%



d2	d1	S mm	d2	d1	S mm
Ø16	6.5	3	Ø40	13.5	5
	11	4		17	6
Ø20	8.5	3		21	7
	11	4		32	8
	13	5	Ø50	17	6
Ø25	10.5	3		26	7
	12	4		32	8
	14	5		37	10
Ø32	13.5	3	Ø63	17	6
	18	4		32	10
	21	5	Ø80	21	8
	23.5	6		42	10
	25	7	Ø100	21	10

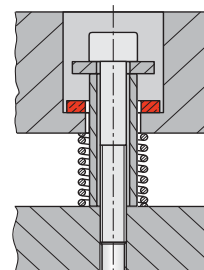


Order:

Code. d1 x d2 x S

Order Example:

PRPS. 11 x 20 x 4



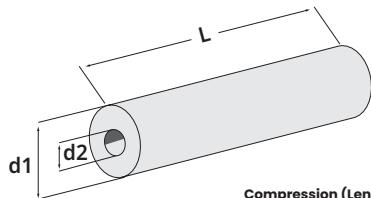
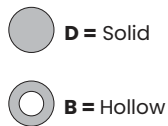
Mounting Example


90 SHORE

Code: **PYK**
80 SHORE

Code: **PYS**

Polyurethane Compression Spring



Compression (Length)

Red 25%

Order Code		d1	d2 Hollow	L Length
Type / Solid	Type / Hollow			
PYKD 16	PYKB 16	16	6.5	310 mm
PYKD 20	PYKB 20	20	8.5	310 mm
PYKD 25	PYKB 25	25	10.5	310 mm
PYKD 32	PYKB 32	32	13.5	310 mm
PYKD 40	PYKB 40	40	13.5	310 mm
PYKD 50	PYKB 50	50	17	310 mm
PYKD 63	PYKB 63	63	17	310 mm
PYKD 80	PYKB 80	80	21	310 mm
PYKD 100	PYKB 100	100	21	310 mm
PYKD 125	PYKB 125	125	27	310 mm

Yellow 35%

Order Code		d1	d2 Hollow	L Length
Type / Solid	Type / Hollow			
PYSD 16	PYSB 16	16	6.5	310 mm
PYSD 20	PYSB 20	20	8.5	310 mm
PYSD 25	PYSB 25	25	10.5	310 mm
PYSD 32	PYSB 32	32	13.5	310 mm
PYSD 40	PYSB 40	40	13.5	310 mm
PYSD 50	PYSB 50	50	17	310 mm
PYSD 63	PYSB 63	63	17	310 mm
PYSD 80	PYSB 80	80	21	310 mm
PYSD 100	PYSB 100	100	21	310 mm
PYSD 125	PYSB 125	125	27	310 mm

Vulkollan Springs

NEW

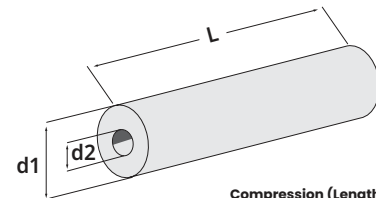
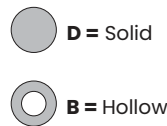

Hollow

Code: **PYBB**


Solid

Code: **PYBD**

Vulkollan Compression Spring



Compression (Length)

92 SHORE / 30%

Order Code		d1	d2 Hollow	L Length
Type / Solid	Type / Hollow			
PYBD 16	PYBB 16	16	6.5	310 mm
PYBD 20	PYBB 20	20	8.5	310 mm
PYBD 25	PYBB 25	25	10.5	310 mm
PYBD 32	PYBB 32	32	13.5	310 mm
PYBD 40	PYBB 40	40	13.5	310 mm
PYBD 50	PYBB 50	50	17	310 mm
PYBD 63	PYBB 63	63	17	310 mm
PYBD 80	PYBB 80	80	21	310 mm
PYBD 100	PYBB 100	100	21	310 mm
PYBD 125	PYBB 125	125	27	310 mm



Sealing



Abrasion resistance



Tear resistance


Shock and impact
resistance


Resistance to chemical products



Bend restrictor



Sound insulation


Advantages of
Vulkollan Over
Polyurethane

Springs

1

NEW

2

3

4

5

Stripper for Blanking Dies

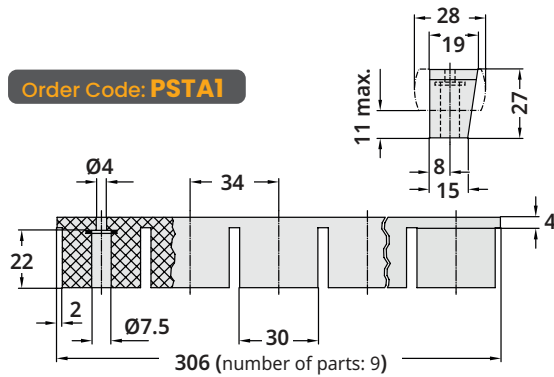
Code: **PSTA..**

Material: Polyurethane / 70 Shore

6

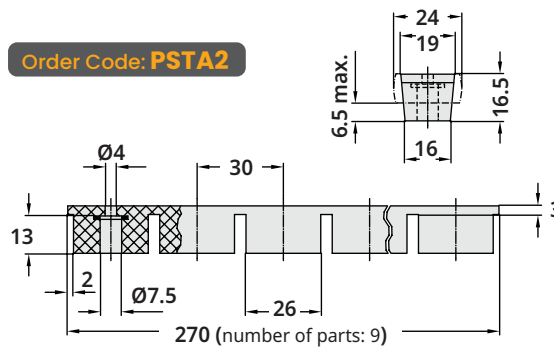
7

Order Code: **PSTA1**



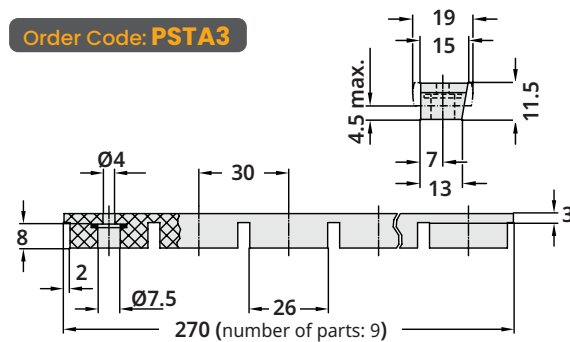
12

Order Code: **PSTA2**



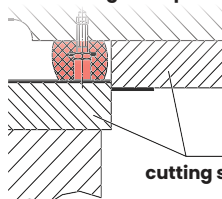
17

Order Code: **PSTA3**



Springs

Mounting Example



Reference: **VDI 3362**
Mercedes-Benz VW

cutting steels

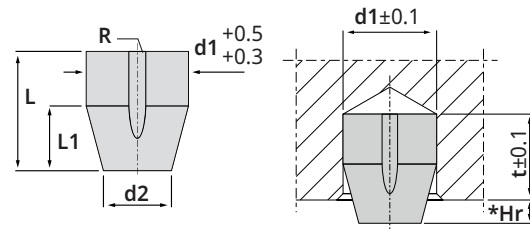
NEW



Compression Piece

Code: **PDTA..**

Material: Polyurethane / 90 Shore

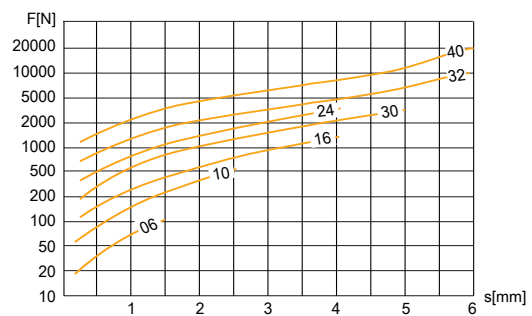


Movement Distance Force (F) Diagram

*Hr: Max. movement distance

1N = 0.1 daN = 0.102 kg.

Order Code	d1	L	d2	L1	t	R	*Hr	Max. Force
PDTA 06	6	9.5	3.6	4.5	8	-	1.5	100 N
PDTA 10	10	15.5	6	7.5	13	1	2.5	450 N
PDTA 16	16	25	9.5	12	21	1.5	4	1500 N
PDTA 24	24	25	18	10	21	2	4	3000 N
PDTA 30	30	35	20	19	30	2.5	5	3000 N
PDTA 32	32	32	24	14	26	3	6	12000 N
PDTA 40	39.5	40	30	16	34	3	6	25000 N

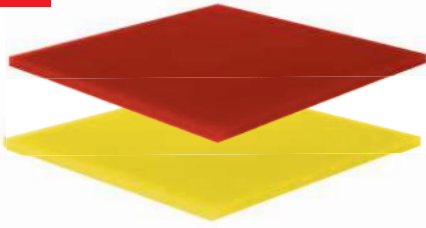


Compression Pieces are used for the removal and extraction of parts stamped in press/die tools. A blind hole is sufficient for placing the product. The ventilation channel has been designed to facilitate pressing (assembly).

- ✦ The use of the "PDTA" prevents damage to the surface of the stamped part.
- ✦ It has a compact design, and the assembly process is quite simple.
- ✦ It significantly contributes to the reduction of noise
- ✦ It is highly resistant to wear and guarantees a long service life.

Hardness: 90 Shore

NEW



Polyurethane Plate

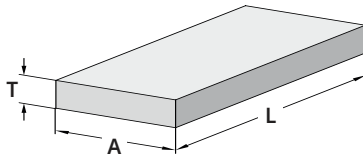
Note: Custom size orders are made upon request.

90 SHORE / Red Plate

Code: **PPK**

80 SHORE / Yellow Plate

Code: **PPS**



A	L	T	A	L	T	A	L	T
250	250	3	250	500	3	500	500	3
		4			4			4
		5			5			5
		6			6			6
		7			7			7
		8			8			8
		10			10			10
		12			12			12
		15			15			15
		20			20			20
		25			25			25
		30			30			30
		40			40			40
		50			50			50
		60			60			60
		70			70			70
		80			80			80

A	L	T	A	L	T	A	L	T
500	1000	3	500	1000	15	1000	1000	10
		4			20			12
		5			25			15
		6			30			20
		7			40			25
		8			50			30
		10			60			40
		12			70			50
					80			



Order:
PP.. x A x L x T

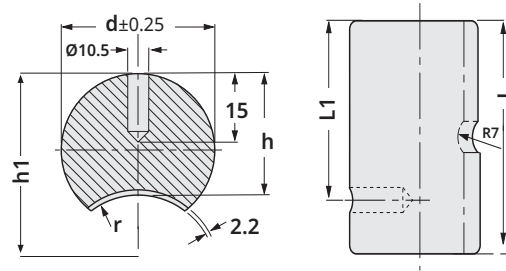
Order Example:
PPK x 250 x 250 x 5



Shock Absorber for Safety Pin

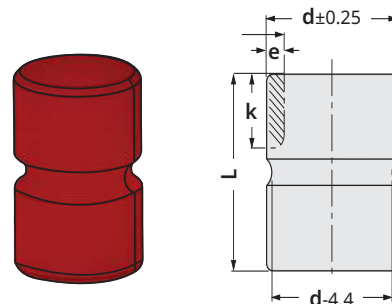
Code: **G57.2**

Material: Polyurethane 90 Shore



Order Code	d	L	L1	h	h1	r
G57.2 40	40	60	45	32	50	18
G57.2 50	50	80	60	40	63	23
G57.2 63	63	80	60	51	86	35

* It should be used with safety pins. **G57.2** product is compatible with the product code **G57**.
* It is an impact and speed retarder product.
* Hardness of polyurethane material is 90 shore.
* All dimensions without tolerance are in EN 22 768-1 mm standards.



Shock Absorber for Safety Pin

Code: **G56.1**

Material: Polyurethane 90 Shore

Order Code	Pin Diameter	d	L	e	k	Max. Press
G56.1 50	40	50	70	8	25	16%
G56.1 63	50	63	80	8	30	12%

1

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18

Springs

1

2

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13

14

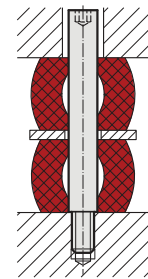
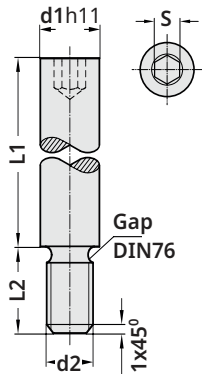
15

16

17

18

Springs



Polyurethane bolt mounting drawing

Code: **PYP**

Guide Bolt for Polyurethane Spring

During guiding of polyurethane springs, countersunk allen head metric thread connected guide bolts can be used as single spring as well as cluster by dividing springs.

d	L1	d2	L2	S	Spring Ø
Ø 6 mm	20	M4	6 mm	3	Ø 16 x 6.5
	25				
	32				
Ø 8 mm	25	M6	9 mm	4	Ø 20 x 8.5
	32				
	40				
	50				
Ø 10 mm	25	M8	15 mm	5	Ø 25 x 10.5
	32				
	40				
	50				
	63				
Ø 13 mm	32	M10	15 mm	6	Ø 32 /40 x 13.5
	40				
	50				
	63				
	80				
	95				
Ø 16 mm	32	M12	18 mm	8	Ø 50 /63 x 17
	40				
	50				
	63				
	80				
	95				
	118				
	140				
Ø 20 mm	40	M16	25 mm	10	Ø 80 /100 x 21
	50				
	63				
	80				
	95				
	118				
	140				
	180				



Order:
PYP. d1 x L1

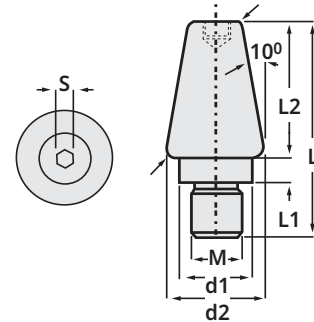
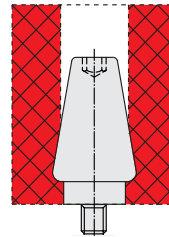


Material: CK45



Code: **PSP**

Locating Bolt for Polyurethane Spring



M	L	d1	d2	L1	L2	SW	Spring Ø
M12	56	19	28	8	30	6	63
M16	74	22	32	10	40	8	80 - 100
M20	100	28	38	15	55	10	125 - 140



Order:
PSP. M x L

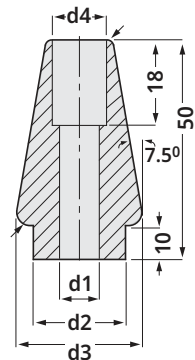
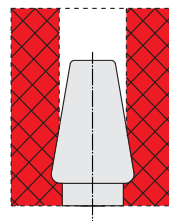


Material:
1.7131 (16MnCr5)



Code: **PMV**

Locating Pin for Polyurethane Spring



M	d1	d2	d3	d4	Spring Ø
M10	11	18	28	17	63
M12	13.5	22	32	19	80 - 100
M16	17.5	28	38	25	125



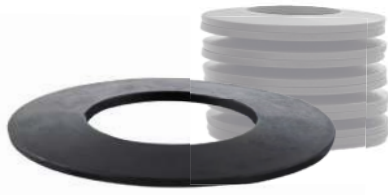
Connection screws as per request:
M10 x 50
M12 x 50
M16 x 60



Order:
PMV. M



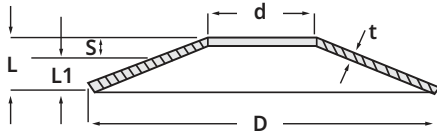
Material:
1.7131 (16MnCr5)



Disc Springs

DIN 2093

Code: **DCY**



Disc Springs: It provides resistance to higher forces at very short working strokes. The advantage of springs with very short spring is that when the pressure is applied, it produces high power with less motion. Disc springs sometimes can be used alone and also as stacked array sets.

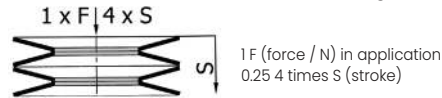
Tension Resistance N: 25 / + 200 50 CrV

Heat Resistance: -15 / +150°

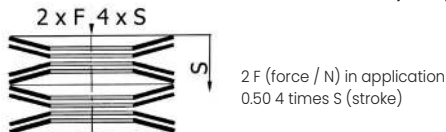
Disc Spring Working Strokes: Applied forces (F / N) should be designed according to the working strokes. Specifying the working strokes should be according to the hole thickness (t) internal wall. L: 0.25 (1/4) or 0.50 (1/2) of free length. In addition, with motion up to 0.75 (3/4), different forces (F/N) per each stroke value may be applied. $F=N / S = \text{mm} / \text{stroke}$

Disc Spring Array (load application)

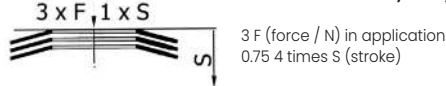
Light Duty



Heavy Duty

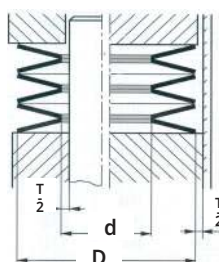


Extra Heavy Duty



Fixing Disc Spring with Shaft

T = working space



D	T
> 8 - 16	0.2
> 16 - 20	0.3
> 20 - 26	0.4
> 26 - 34	0.5
> 34 - 50	0.6
> 50 - 100	0.8

d: Inner hole diameter / **D:** Outer diameter / **t:** Thickness / **L:** Free length
L1: Loading length / **F max:** Flex force / **S:** Flex length stroke / motion

d	D	t	L	L1	F Nw
3.2	8	0.3	0.55	0.36	104
		0.5	0.70	0.55	357
4.2		0.4	0.60	0.45	209
3.2	10	0.3	0.65	0.39	98
		0.4	0.70	0.48	179
4.2		0.5	0.75	0.56	294
		0.6	0.85	0.66	502
5.2		0.4	0.70	0.48	209
		0.5	0.75	0.56	325
4.2	12	0.4	0.80	0.50	178
		0.5	0.85	0.59	284
5.2		0.5	0.90	0.60	349
		0.6	0.95	0.69	506
6.2		0.5	0.85	0.59	326
		0.6	0.95	0.69	551
6.2	12.5	0.5	0.85	0.59	293
		0.7	1.00	0.78	659
7.2	14	0.5	0.90	0.60	279
		0.8	1.10	0.87	796
5.2	15	0.4	0.95	0.54	175
		0.6	1.05	0.71	407
6.2		0.5	1.00	0.63	289
		0.7	1.10	0.80	577
8.2		0.7	1.10	0.80	665
		0.8	1.20	0.90	982
8.2	16	0.4	0.90	0.53	154
		0.6	1.05	0.71	410
		0.9	1.25	0.99	1012
6.2	18	0.5	1.10	0.65	245
		0.7	1.25	0.84	552
8.2		0.8	1.30	0.92	582
		1.0	1.40	1.10	1181
9.2		0.7	1.20	0.83	566
		1.0	1.40	1.10	1253
8.2	20	0.6	1.30	0.77	412
		0.8	1.40	0.95	751
		1.0	1.55	1.14	1294
10.2		0.8	1.35	1.94	748
		1.0	1.55	1.14	1414
8.2	23	0.8	1.55	0.99	718
		0.9	1.60	1.07	918
10.2		1.0	1.70	1.17	1315

d	D	t	L	L1	F Nw
12.2	25	0.7	1.60	0.92	599
		0.9	1.60	1.07	862
10.2	28	0.80	1.75	1.04	661
		1.00	1.90	1.23	1129
14.2		0.80	1.80	1.05	801
		1.00	1.80	1.20	1107
16.3	31.5	1.25	2.15	1.48	1912
		1.50	2.40	1.73	3228
12.3	34	1.25	2.35	1.53	1814
		1.50	2.50	1.75	2719
14.3		1.25	2.40	1.54	1988
		1.50	2.55	1.76	2982
16.3		1.50	2.55	1.76	3153
		2.00	2.85	2.21	5779
14.3	40	1.50	2.75	1.81	2544
		2.00	3.05	2.26	4766
16.3		1.50	2.80	1.83	2748
		2.00	3.10	2.28	5166
20.4		2.00	3.10	2.28	5698
		2.50	3.45	2.74	9384
22.4	45	1.75	3.05	2.08	3644
		2.50	3.50	2.75	7712
20.4	50	2.00	3.50	2.38	4685
		2.50	3.85	2.84	7915
25.4		2.00	3.40	2.35	4760
		2.50	3.90	2.85	9058
		3.00	4.10	3.28	11970
20.5	60	2.50	4.70	2.95	7293
		3.00	5.20	3.42	11563
30.5		3.00	4.70	3.42	13219
		3.50	5.00	3.88	18143
40.5	70	4.00	5.70	4.04	23338
		5.00	6.40	5.30	33653
31	80	4.00	6.10	4.50	19384
41		3.00	5.30	3.58	10512
		5.00	6.70	5.42	33541
41	100	5.00	7.75	5.69	32344
51		6.00	8.20	6.55	47995

1 Newton : 0.102 Kg.



Order: **DCY. d x D x t**

Springs