

Chrome-vanadium standard die-springs

Precision Spring Europe S.P.A. has produced a wide range of high quality die-springs suitable to meet requirements of the most qualified industry. These springs have been designed and manufactured by adopting technological means and solutions, which place them at the top level for performance and reliability.

Material:

Only Chrome-Vanadium Steel is used: the best material for springs offered by modern technology.

Design:

The section of the spring is produced so that the winding appears in rectangular (and not trapezoidal) shape with round edges. In this way, best performance and low material stress are obtained. More over, the particular shape of edges increases the fatigue resistance of the springs.

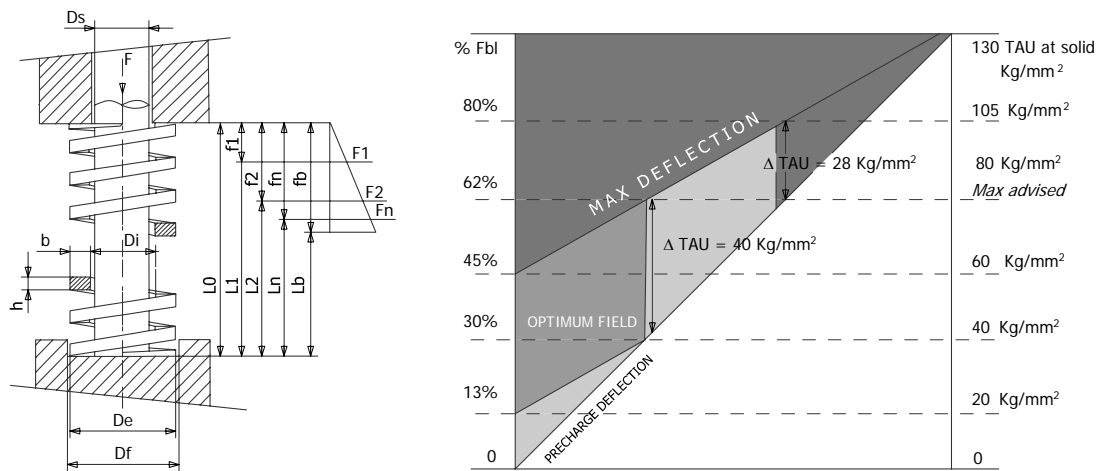
Heat and surface treatments:

Carried out by means of the most modern and sophisticated equipments, they guarantee a correct material structure and constant characteristics of the complete production range. The surface shot peening treatment improves the surface and the springs' long-life resistance to fatigue.

Inspection:

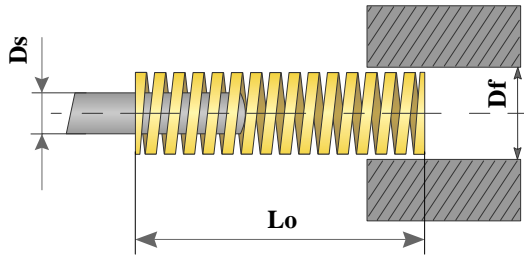
Periodical laboratory analyses are carried out in materials, as well as production and statistical controls on finished products. In conclusion, the fatigue test represents the most severe control on springs. All these tests form the best guarantee of the product quality.

OPTIMUM WORKING RANGE FOR LONG-LIFE RESISTANCE TO FATIGUE



Sketch and symbols of the spring

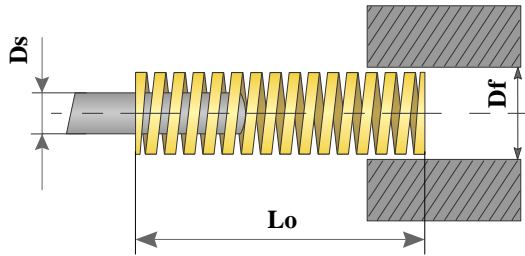
De (mm)	Outside diameter of the spring
Di (mm)	Inside diameter of the spring
D (mm)	Diameter of the hole (in which the spring can freely work)
d (mm)	Diameter of the rod (on which the spring can freely work)
L (mm)	Free length of the spring (not subjected to any external force or load)
L1, L2, Ln (mm)	Length of the spring, (measured along its axis at loads F1, F2, Fn)
Lb (mm)	Solid height (minimum length of the spring at joint coils)
f1, f2, fn (mm)	Deflections (difference between L0 and L1, L2, Ln)
b (mm)	Basis (side of wire measured perpendicularly to the spring's axis)
h (mm)	Height (side of wire measured parallel to the spring's axis)
Rg (Kg/mm)	Rate (variation $\Delta F = F2 - F1$ of load F supported by the spring which causes the unit variation of the length or of the $\Delta L = L2 - L1$ deflection $\Delta f = f2 - f1$ $RG = \Delta F / \Delta L = \Delta F / \Delta f$ (Kg/mm)



SL

light duty
colour : light yellow

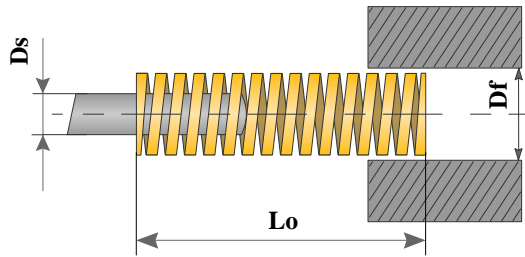
Code	Df	Ds	Lo	Rate	Solid Spring		Deflection and Load			
	∅ Hole mm	∅ Rod mm	Free Length mm	Rg Kg/mm	Lb mm	fb mm	Primary 13% fb		Max. Recommended 62% fb	
	mm	mm	mm	Kg/mm	mm	mm	mm	Kg	mm	Kg
SL 10X25	10	5	25	1.00	12.6	12.4	1.6	1.61	7.7	7.69
SL 10X32			32	0.82	16.0	16.0	2.1	1.71	9.9	8.13
SL 10X38			38	0.64	19.0	19.0	2.5	1.58	11.8	7.54
SL 10X44			44	0.56	22.0	22.0	2.9	1.60	13.6	7.64
SL 10X51			51	0.48	24.5	26.5	3.4	1.65	16.4	7.89
SL 10X64			64	0.40	31.0	33.0	4.3	1.72	20.5	8.18
SL 10X76			76	0.31	36.7	39.3	5.1	1.58	24.4	7.55
SL 13X25	13	7	25	1.69	12.5	12.5	1.6	2.75	7.8	13.10
SL 13X32			32	1.29	15.8	16.2	2.1	2.72	10.0	12.96
SL 13X38			38	1.07	18.6	19.4	2.5	2.70	12.0	12.87
SL 13X44			44	0.89	22.0	22.0	2.9	2.55	13.6	12.14
SL 13X51			51	0.80	24.0	27.0	3.5	2.81	16.7	13.39
SL 13X64			64	0.63	30.0	34.0	4.4	2.78	21.1	13.28
SL 13X76			76	0.52	35.5	40.5	5.3	2.74	25.1	13.06
SL 13X89			89	0.43	42.5	46.5	6.0	2.60	28.8	12.40
SL 13X102			102	0.39	47.0	55.0	7.2	2.79	34.1	13.30
SL 16X25	16	8	25	2.64	12.5	12.5	1.6	4.29	7.8	20.46
SL 16X32			32	2.15	15.5	16.5	2.1	4.61	10.2	21.99
SL 16X38			38	1.78	18.0	20.0	2.6	4.63	12.4	22.07
SL 16X44			44	1.58	21.5	22.5	2.9	4.62	14.0	22.04
SL 16X51			51	1.50	23.5	27.5	3.6	5.36	17.1	25.58
SL 16X64			64	1.04	29.5	34.5	4.5	4.66	21.4	22.25
SL 16X76			76	0.92	34.7	41.3	5.4	4.94	25.6	23.56
SL 16X89			89	0.77	41.5	47.5	6.2	4.75	29.5	22.68
SL 16X102			102	0.69	45.8	56.2	7.3	5.04	34.8	24.04
SL 16X115			115	0.57	51.0	64.0	8.3	4.74	39.7	22.62
SL 20X25	20	10	25	5.10	12.4	12.6	1.6	8.35	7.8	39.84
SL 20X32			32	3.90	15.3	16.7	2.2	8.47	10.4	40.38
SL 20X38			38	3.18	18.0	20.0	2.6	8.27	12.4	39.43
SL 20X44			44	2.67	21.0	23.0	3.0	7.98	14.3	38.07
SL 20X51			51	2.20	23.2	27.8	3.6	7.95	17.2	37.92
SL 20X64			64	1.82	29.0	35.0	4.6	8.28	21.7	39.49
SL 20X76			76	1.49	33.9	42.1	5.5	8.15	26.1	38.89
SL 20X89			89	1.28	40.0	49.0	6.4	8.15	30.4	38.89
SL 20X102			102	1.10	44.5	57.5	7.5	8.22	35.7	39.22
SL 20X115			115	0.98	50.0	65.0	8.5	8.28	40.3	39.49
SL 20X127			127	0.88	55.0	72.0	9.4	8.24	44.6	39.28
SL 20X139			139	0.78	62.0	77.0	10.0	7.81	47.7	37.24
SL 20X152			152	0.70	66.0	86.0	11.2	7.83	53.3	37.32
SL 26X25	26	13	25	8.00	12.4	12.6	1.6	13.10	7.8	62.50
SL 26X32			32	5.95	14.7	17.3	2.2	13.38	10.7	63.82
SL 26X38			38	4.88	17.4	20.6	2.7	13.07	12.8	62.33
SL 26X44			44	4.04	19.9	24.1	3.1	12.66	14.9	60.37
SL 26X51			51	3.59	21.8	29.2	3.8	13.63	18.1	64.99
SL 26X64			64	2.79	26.7	37.3	4.8	13.53	23.1	64.52
SL 26X76			76	2.32	31.5	44.5	5.8	13.42	27.6	64.01
SL 26X89			89	1.91	37.3	51.7	6.7	12.84	32.1	61.22
SL 26X102			102	1.71	41.0	61.0	7.9	13.56	37.8	64.67
SL 26X115			115	1.52	46.0	69.0	9.0	13.63	42.8	65.03
SL 26X127			127	1.35	51.0	76.0	9.9	13.34	47.1	63.61
SL 26X139			139	1.20	57.0	82.0	10.7	12.79	50.8	61.01
SL 26X152			152	1.12	61.0	91.0	11.8	13.25	56.4	63.19
SL 26X178			178	0.93	73.0	105.0	13.7	12.69	65.1	60.54
SL 26X203			203	0.83	80.0	123.0	16.0	13.27	76.3	63.30



SL

light duty
colour : light yellow

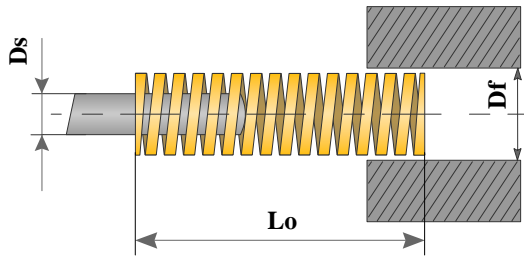
Code	Df	Ds	Lo	Rate	Solid Spring		Deflection and Load					
	∅ Hole mm	∅ Rod mm	Free Length mm	Rg Kg/mm	Lb mm	fb mm	Primary 13% fb		Max. Recommended 62% fb			
							mm	Kg	mm	Kg		
SL 32X38	32	16	38	8.95	20.0	18.0	2.3	20.94	11.2	99.88		
SL 32X44			44	7.34	23.3	20.7	2.7	19.75	12.8	94.20		
SL 32X51			51	6.51	25.0	26.0	3.4	22.00	16.1	104.94		
SL 32X64			64	5.02	30.0	34.0	4.4	22.19	21.1	105.82		
SL 32X76			76	4.15	35.0	41.0	5.3	22.12	25.4	105.49		
SL 32X89			89	3.41	41.5	47.5	6.2	21.06	29.5	100.42		
SL 32X102			102	3.05	45.5	56.5	7.3	22.40	35.0	106.84		
SL 32X115			115	2.70	51.0	64.0	8.3	22.46	39.7	107.14		
SL 32X127			127	2.41	56.5	70.5	9.2	22.09	43.7	105.34		
SL 32X139			139	2.14	62.8	76.2	9.9	21.20	47.2	101.10		
SL 32X152			152	1.99	67.5	84.5	11.0	21.86	52.4	104.26		
SL 32X178			178	1.70	80.5	97.5	12.7	21.55	60.5	102.77		
SL 32X203			203	1.48	89.0	114.0	14.8	21.93	70.7	104.61		
SL 32X254			254	1.17	111.0	143.0	18.6	21.75	88.7	103.73		
SL 32X315			315	0.90	138.0	177.0	23.0	20.71	109.7	98.77		
SL 38X51	38	20	51	11.20	25.4	25.6	3.3	37.27	15.9	177.77		
SL 38X64			64	8.57	31.0	33.0	4.3	36.77	20.5	175.34		
SL 38X76			76	7.04	36.5	39.5	5.1	36.15	24.5	172.41		
SL 38X89			89	5.76	43.0	46.0	6.0	34.44	28.5	164.28		
SL 38X102			102	5.13	48.0	54.0	7.0	36.01	33.5	171.75		
SL 38X115			115	4.54	53.0	62.0	8.1	36.59	38.4	174.52		
SL 38X127			127	4.04	59.0	68.0	8.8	35.71	42.2	170.33		
SL 38X139			139	3.58	65.0	74.0	9.6	34.44	45.9	164.25		
SL 38X152			152	3.33	70.0	82.0	10.7	35.50	50.8	169.30		
SL 38X178			178	2.75	83.0	95.0	12.4	33.96	58.9	161.98		
SL 38X203			203	2.46	92.0	111.0	14.4	35.50	68.8	169.30		
SL 38X254			254	1.95	114.0	140.0	18.2	35.49	86.8	169.26		
SL 38X315			315	1.54	143.0	172.0	22.4	34.43	106.6	164.23		
SL 50X64			50	25	64	15.08	32.5	31.5	4.1	61.75	19.5	294.51
SL 50X76					76	12.30	38.0	38.0	4.9	60.76	23.6	289.79
SL 50X89	89	10.50			44.0	45.0	5.9	61.43	27.9	292.95		
SL 50X102	102	8.89			49.0	53.0	6.9	61.25	32.9	292.13		
SL 50X115	115	7.85			54.0	61.0	7.9	62.25	37.8	296.89		
SL 50X127	127	7.00			58.0	69.0	9.0	62.79	42.8	299.46		
SL 50X139	139	6.46			65.0	74.0	9.6	62.15	45.9	296.38		
SL 50X152	152	5.72			72.0	80.0	10.4	59.49	49.6	283.71		
SL 50X178	178	4.91			82.0	96.0	12.5	61.28	59.5	292.24		
SL 50X203	203	4.22			89.0	114.0	14.8	62.54	70.7	298.27		
SL 50X254	254	3.34			112.0	142.0	18.5	61.66	88.0	294.05		
SL 50X315	315	2.73			145.0	170.0	22.1	60.33	105.4	287.74		
SL 63X76	63	38			76	17.86	38.0	38.0	4.9	88.23	23.6	420.78
SL 63X89					89	15.15	45.0	44.0	5.7	86.66	27.3	413.29
SL 63X102					102	12.69	49.0	53.0	6.9	87.43	32.9	416.99
SL 63X115			115	11.14	54.0	61.0	7.9	88.34	37.8	421.31		
SL 63X127			127	9.84	58.0	69.0	9.0	88.26	42.8	420.96		
SL 63X139			139	8.67	64.0	75.0	9.8	84.53	46.5	403.16		
SL 63X152			152	8.03	71.0	81.0	10.5	84.56	50.2	403.27		
SL 63X178			178	6.58	81.0	97.0	12.6	82.97	60.1	395.72		
SL 63X203			203	5.88	89.0	114.0	14.8	87.14	70.7	415.60		
SL 63X254			254	4.63	109.0	145.0	18.9	87.28	89.9	416.24		
SL 63X315			315	3.63	143.0	172.0	22.4	81.17	106.6	387.10		



S

medium duty
colour : dark yellow

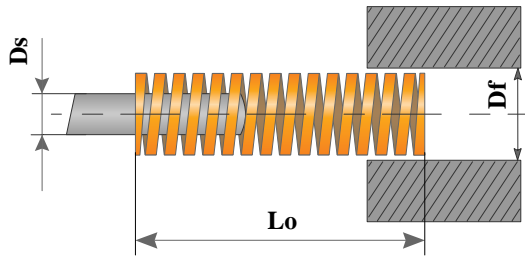
Code	Df	Ds	Lo	Rate	Solid Spring		Deflection and Load			
	∅ Hole mm	∅ Rod mm	Free Length mm	Rg Kg/mm	Lb mm	fb mm	Primary 13% fb		Max. Recommended 62% fb	
	mm	mm	mm	Kg/mm	mm	mm	mm	Kg	mm	Kg
S 10X25	10	5	25	1.71	16.0	9.0	1.2	2.00	5.6	9.54
S 10X32			32	1.30	20.0	12.0	1.6	2.03	7.4	9.67
S 10X38			38	1.08	24.0	14.0	1.8	1.97	8.7	9.37
S 10X44			44	0.91	27.2	16.8	2.2	1.99	10.4	9.48
S 10X51			51	0.81	30.0	21.0	2.7	2.21	13.0	10.55
S 10X64			64	0.68	38.0	26.0	3.4	2.30	16.1	10.96
S 10X76			76	0.53	45.0	31.0	4.0	2.14	19.2	10.19
S 13X25	13	7	25	2.82	16.0	9.0	1.2	3.30	5.6	15.74
S 13X32			32	2.13	20.0	12.0	1.6	3.32	7.4	15.85
S 13X38			38	1.77	24.0	14.0	1.8	3.22	8.7	15.36
S 13X44			44	1.47	27.5	16.5	2.1	3.15	10.2	15.04
S 13X51			51	1.31	30.5	20.5	2.7	3.49	12.7	16.65
S 13X64			64	1.02	38.5	25.5	3.3	3.38	15.8	16.13
S 13X76			76	0.85	45.0	31.0	4.0	3.43	19.2	16.34
S 13X89			89	0.70	53.6	35.4	4.6	3.22	21.9	15.36
S 13X102			102	0.63	59.6	42.4	5.5	3.47	26.3	16.56
S 16X25	16	8	25	4.80	16.0	9.0	1.2	5.62	5.6	26.78
S 16X32			32	3.60	20.0	12.0	1.6	5.62	7.4	26.78
S 16X38			38	3.00	23.0	15.0	2.0	5.85	9.3	27.90
S 16X44			44	2.66	27.5	16.5	2.1	5.71	10.2	27.21
S 16X51			51	2.35	30.0	21.0	2.7	6.42	13.0	30.60
S 16X64			64	1.81	37.0	27.0	3.5	6.35	16.7	30.30
S 16X76			76	1.55	43.8	32.2	4.2	6.49	20.0	30.94
S 16X89			89	1.30	53.0	36.0	4.7	6.08	22.3	29.02
S 16X102			102	1.15	57.7	44.3	5.8	6.62	27.5	31.59
S 16X115			115	0.93	64.2	50.8	6.6	6.14	31.5	29.29
S 20X25	20	10	25	8.50	16.0	9.0	1.2	9.95	5.6	47.43
S 20X32			32	6.45	20.0	12.0	1.6	10.06	7.4	47.99
S 20X38			38	4.98	23.0	15.0	2.0	9.71	9.3	46.31
S 20X44			44	4.23	27.0	17.0	2.2	9.35	10.5	44.58
S 20X51			51	3.68	29.5	21.5	2.8	10.29	13.3	49.05
S 20X64			64	2.88	36.4	27.6	3.6	10.33	17.1	49.28
S 20X76			76	2.31	43.0	33.0	4.3	9.91	20.5	47.26
S 20X89			89	1.95	51.0	38.0	4.9	9.63	23.6	45.94
S 20X102			102	1.77	56.3	45.7	5.9	10.52	28.3	50.15
S 20X115			115	1.60	63.0	52.0	6.8	10.82	32.2	51.58
S 20X127			127	1.45	70.0	57.0	7.4	10.74	35.3	51.24
S 20X139			139	1.30	78.0	61.0	7.9	10.31	37.8	49.17
S 20X152			152	1.15	83.0	69.0	9.0	10.32	42.8	49.20
S 26X25	26	13	25	13.33	15.5	9.5	1.2	16.46	5.9	78.51
S 26X32			32	9.78	19.0	13.0	1.7	16.53	8.1	78.83
S 26X38			38	7.96	22.5	15.5	2.0	16.04	9.6	76.50
S 26X44			44	6.54	26.0	18.0	2.3	15.30	11.2	72.99
S 26X51			51	5.80	28.5	22.5	2.9	16.97	14.0	80.91
S 26X64			64	4.49	35.0	29.0	3.8	16.93	18.0	80.73
S 26X76			76	3.71	41.0	35.0	4.6	16.88	21.7	80.51
S 26X89			89	3.05	50.0	39.0	5.1	15.46	24.2	73.75
S 26X102			102	2.72	54.0	48.0	6.2	16.97	29.8	80.95
S 26X115			115	2.42	59.0	56.0	7.3	17.62	34.7	84.02
S 26X127			127	2.15	65.0	62.0	8.1	17.33	38.4	82.65
S 26X139			139	1.91	73.0	66.0	8.6	16.39	40.9	78.16
S 26X152			152	1.78	78.0	74.0	9.6	17.12	45.9	81.67
S 26X178			178	1.47	94.0	84.0	10.9	16.05	52.1	76.56
S 26X203			203	1.32	104.0	99.0	12.9	16.99	61.4	81.02



S

medium duty
colour : dark yellow

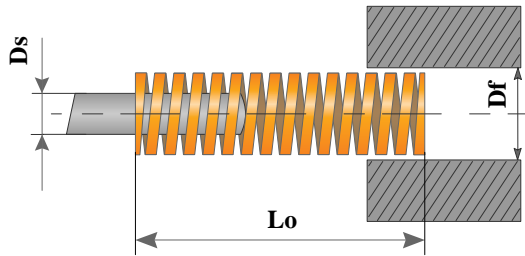
Code	Df	Ds	Lo	Rate	Solid Spring		Deflection and Load			
	∅ Hole mm	∅ Rod mm	Free Length mm	Rg Kg/mm	Lb mm	fb mm	Primary 13% fb		Max. Recommended 62% fb	
							mm	Kg	mm	Kg
S 32X38	32	16	38	15.87	24.0	14.0	1.8	28.88	8.7	137.75
S 32X44			44	13.50	28.0	16.0	2.1	28.08	9.9	133.92
S 32X51			51	11.68	30.5	20.5	2.7	31.13	12.7	148.45
S 32X64			64	8.59	38.0	26.0	3.4	29.03	16.1	138.47
S 32X76			76	6.99	43.0	33.0	4.3	29.99	20.5	143.02
S 32X89			89	5.91	53.0	36.0	4.7	27.66	22.3	131.91
S 32X102			102	5.21	58.0	44.0	5.7	29.80	27.3	142.13
S 32X115			115	4.55	64.0	51.0	6.6	30.17	31.6	143.87
S 32X127			127	3.97	70.0	57.0	7.4	29.42	35.3	140.30
S 32X139			139	3.70	79.0	60.0	7.8	28.86	37.2	137.64
S 32X152			152	3.29	84.0	68.0	8.8	29.08	42.2	138.71
S 32X178			178	2.83	99.0	79.0	10.3	29.06	49.0	138.61
S 32X203			203	2.56	110.0	93.0	12.1	30.95	57.7	147.61
S 32X254			254	1.87	136.0	118.0	15.3	28.69	73.2	136.81
S 32X315	315	1.55	171.0	144.0	18.7	29.02	89.3	138.38		
S 38X51	38	20	51	18.93	32.0	19.0	2.5	46.76	11.8	223.00
S 38X64			64	14.32	39.0	25.0	3.3	46.54	15.5	221.96
S 38X76			76	11.70	46.0	30.0	3.9	45.63	18.6	217.62
S 38X89			89	9.51	54.0	35.0	4.6	43.27	21.7	206.37
S 38X102			102	8.46	60.0	42.0	5.5	46.19	26.0	220.30
S 38X115			115	7.47	66.0	49.0	6.4	47.58	30.4	226.94
S 38X127			127	6.63	72.7	54.3	7.1	46.80	33.7	223.21
S 38X139			139	5.87	80.5	58.5	7.6	44.64	36.3	212.90
S 38X152			152	5.45	86.0	66.0	8.6	46.76	40.9	223.01
S 38X178			178	4.49	102.0	76.0	9.9	44.36	47.1	211.57
S 38X203			203	4.02	113.0	90.0	11.7	47.03	55.8	224.32
S 38X254			254	3.18	140.0	114.0	14.8	47.13	70.7	224.76
S 38X315			315	2.50	176.0	139.0	18.1	45.18	86.2	215.45
S 50X64			50	25	64	25.09	39.0	25.0	3.3	81.54
S 50X76	76	20.15			45.5	30.5	4.0	79.89	18.9	381.04
S 50X89	89	15.40			53.5	35.5	4.6	71.07	22.0	338.95
S 50X102	102	13.40			60.0	42.0	5.5	73.16	26.0	348.94
S 50X115	115	11.93			65.0	50.0	6.5	77.55	31.0	369.83
S 50X127	127	11.04			73.0	54.0	7.0	77.50	33.5	369.62
S 50X139	139	10.00			80.0	59.0	7.7	76.70	36.6	365.80
S 50X152	152	9.07			88.0	64.0	8.3	75.46	39.7	359.90
S 50X178	178	7.59			103.0	75.0	9.8	74.00	46.5	352.94
S 50X203	203	6.77			115.0	88.0	11.4	77.45	54.6	369.37
S 50X254	254	5.03			140.0	114.0	14.8	74.54	70.7	355.52
S 50X315	315	4.00	176.0	139.0	18.1	72.28	86.2	344.72		
S 63X76	63	38	76	33.77	47.5	28.5	3.7	125.12	17.7	596.72
S 63X89			89	26.79	54.7	34.3	4.5	119.46	21.3	569.72
S 63X102			102	23.55	60.0	42.0	5.5	128.58	26.0	613.24
S 63X115			115	20.56	66.0	49.0	6.4	130.97	30.4	624.61
S 63X127			127	18.08	73.0	54.0	7.0	126.92	33.5	605.32
S 63X139			139	15.86	81.0	58.0	7.5	119.58	36.0	570.33
S 63X152			152	14.67	85.5	66.5	8.6	126.82	41.2	604.84
S 63X178			178	11.96	101.0	77.0	10.0	119.72	47.7	570.97
S 63X203			203	10.65	111.0	92.0	12.0	127.37	57.0	607.48
S 63X254			254	8.36	137.0	117.0	15.2	127.16	72.5	606.43
S 63X315			315	6.53	170.0	145.0	18.9	123.09	89.9	587.05



HL

heavy duty
colour : bright orange

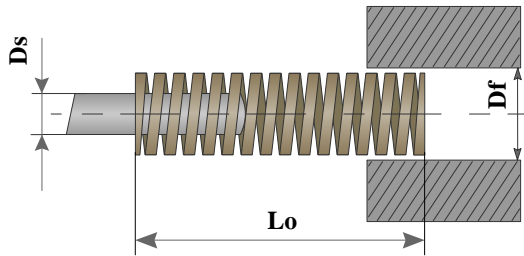
Code	Df	Ds	Lo	Rate	Solid Spring		Deflection and Load			
	∅ Hole mm	∅ Rod mm	Free Length mm	Rg Kg/mm	Lb mm	fb mm	Primary 13% fb		Max. Recommended 62% fb	
							mm	Kg	mm	Kg
HL 10X25	10	5	25	2.66	17.5	7.5	1.0	2.59	4.7	12.37
HL 10X32			32	2.00	22.0	10.0	1.3	2.60	6.2	12.40
HL 10X38			38	1.68	26.0	12.0	1.6	2.62	7.4	12.50
HL 10X44			44	1.40	30.0	14.0	1.8	2.55	8.7	12.15
HL 10X51			51	1.25	33.0	18.0	2.3	2.93	11.2	13.95
HL 10X64			64	1.00	41.0	23.0	3.0	2.99	14.3	14.26
HL 10X76			76	0.81	50.0	26.0	3.4	2.74	16.1	13.06
HL 13X25	13	7	25	4.46	17.5	7.5	1.0	4.35	4.7	20.74
HL 13X32			32	3.35	21.9	10.1	1.3	4.40	6.3	20.98
HL 13X38			38	2.76	26.0	12.0	1.6	4.31	7.4	20.53
HL 13X44			44	2.29	30.0	14.0	1.8	4.17	8.7	19.88
HL 13X51			51	2.04	34.0	17.0	2.2	4.51	10.5	21.50
HL 13X64			64	1.59	42.0	22.0	2.9	4.55	13.6	21.69
HL 13X76			76	1.32	50.0	26.0	3.4	4.46	16.1	21.28
HL 13X89			89	1.09	58.0	31.0	4.0	4.39	19.2	20.95
HL 13X102			102	0.98	65.0	37.0	4.8	4.71	22.9	22.48
HL 16X25	16	8	25	7.46	17.0	8.0	1.0	7.76	5.0	37.00
HL 16X32			32	5.55	21.0	11.0	1.4	7.94	6.8	37.85
HL 16X38			38	4.55	25.0	13.0	1.7	7.69	8.1	36.67
HL 16X44			44	3.96	29.0	15.0	2.0	7.72	9.3	36.83
HL 16X51			51	3.45	33.0	18.0	2.3	8.07	11.2	38.50
HL 16X64			64	2.70	41.0	23.0	3.0	8.07	14.3	38.50
HL 16X76			76	2.36	47.0	29.0	3.8	8.90	18.0	42.43
HL 16X89			89	1.94	56.3	32.7	4.3	8.25	20.3	39.33
HL 16X102			102	1.69	62.0	40.0	5.2	8.79	24.8	41.91
HL 16X115			115	1.41	69.0	46.0	6.0	8.43	28.5	40.21
HL 20X25	20	10	25	12.66	17.1	7.9	1.0	13.00	4.9	62.01
HL 20X32			32	9.32	21.0	11.0	1.4	13.33	6.8	63.56
HL 20X38			38	7.60	24.8	13.2	1.7	13.04	8.2	62.20
HL 20X44			44	6.26	29.0	15.0	2.0	12.21	9.3	58.22
HL 20X51			51	5.56	32.0	19.0	2.5	13.73	11.8	65.50
HL 20X64			64	4.30	39.5	24.5	3.2	13.70	15.2	65.32
HL 20X76			76	3.56	46.5	29.5	3.8	13.65	18.3	65.11
HL 20X89			89	2.92	55.0	34.0	4.4	12.91	21.1	61.55
HL 20X102			102	2.62	61.0	41.0	5.3	13.96	25.4	66.60
HL 20X115			115	2.32	68.0	47.0	6.1	14.18	29.1	67.60
HL 20X127			127	2.07	75.0	52.0	6.8	13.99	32.2	66.74
HL 20X139			139	1.84	84.0	55.0	7.2	13.16	34.1	62.74
HL 20X152			152	1.71	91.0	61.0	7.9	13.56	37.8	64.67
HL 26X25	26	13	25	21.33	17.5	7.5	1.0	20.80	4.7	99.18
HL 26X32			32	15.44	22.0	10.0	1.3	20.07	6.2	95.73
HL 26X38			38	12.48	26.0	12.0	1.6	19.47	7.4	92.85
HL 26X44			44	10.21	29.0	15.0	2.0	19.91	9.3	94.95
HL 26X51			51	9.03	32.5	18.5	2.4	21.72	11.5	103.57
HL 26X64			64	6.94	38.8	25.2	3.3	22.74	15.6	108.43
HL 26X76			76	5.72	47.0	29.0	3.8	21.56	18.0	102.85
HL 26X89			89	4.69	55.0	34.0	4.4	20.73	21.1	98.87
HL 26X102			102	4.19	62.0	40.0	5.2	21.79	24.8	103.91
HL 26X115			115	3.71	68.0	47.0	6.1	22.67	29.1	108.11
HL 26X127			127	3.30	74.2	52.8	6.9	22.65	32.7	108.03
HL 26X139			139	2.93	82.0	57.0	7.4	21.71	35.3	103.55
HL 26X152			152	2.73	88.0	64.0	8.3	22.71	39.7	108.33
HL 26X178			178	2.25	105.9	72.1	9.4	21.09	44.7	100.58
HL 26X203			203	2.02	116.9	86.1	11.2	22.61	53.4	107.83



HL

heavy duty
colour : bright orange

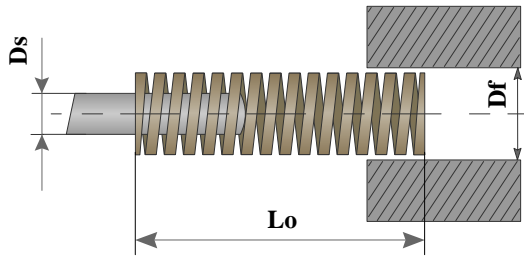
Code	Df	Ds	Lo	Rate	Solid Spring		Deflection and Load					
	∅ Hole mm	∅ Rod mm	Free Length mm	Rg Kg/mm	Lb mm	fb mm	Primary 13% fb		Max. Recommended 62% fb			
							mm	Kg	mm	Kg		
HL 32X38	32	16	38	23.24	25.0	13.0	1.7	39.28	8.1	187.31		
HL 32X44			44	18.77	29.5	14.5	1.9	35.38	9.0	168.74		
HL 32X51			51	16.50	32.0	19.0	2.5	40.76	11.8	194.37		
HL 32X64			64	12.50	39.0	25.0	3.3	40.63	15.5	193.75		
HL 32X76			76	10.29	47.0	29.0	3.8	38.79	18.0	185.01		
HL 32X89			89	8.39	56.0	33.0	4.3	35.99	20.5	171.66		
HL 32X102			102	7.47	61.0	41.0	5.3	39.82	25.4	189.89		
HL 32X115			115	6.60	68.0	47.0	6.1	40.33	29.1	192.32		
HL 32X127			127	5.87	75.0	52.0	6.8	39.68	32.2	189.25		
HL 32X139			139	5.20	84.0	55.0	7.2	37.18	34.1	177.32		
HL 32X152			152	4.83	89.0	63.0	8.2	39.56	39.1	188.66		
HL 32X178			178	3.98	107.0	71.0	9.2	36.74	44.0	175.20		
HL 32X203			203	3.57	122.0	81.0	10.5	37.59	50.2	179.29		
HL 32X254			254	2.83	152.0	102.0	13.3	37.53	63.2	178.97		
HL 32X315			315	2.23	189.0	126.0	16.4	36.53	78.1	174.21		
HL 38X51	38	20	51	32.00	34.2	16.8	2.2	69.89	10.4	333.31		
HL 38X64			64	24.47	42.0	22.0	2.9	69.98	13.6	333.77		
HL 38X76			76	19.64	49.0	27.0	3.5	68.94	16.7	328.77		
HL 38X89			89	16.07	58.0	31.0	4.0	64.76	19.2	308.87		
HL 38X102			102	14.10	63.0	39.0	5.1	71.49	24.2	340.94		
HL 38X115			115	12.54	72.0	43.0	5.6	70.10	26.7	334.32		
HL 38X127			127	11.21	79.0	48.0	6.2	69.95	29.8	333.61		
HL 38X139			139	9.90	87.0	52.0	6.8	66.92	32.2	319.18		
HL 38X152			152	9.08	95.0	57.0	7.4	67.28	35.3	320.89		
HL 38X178			178	7.59	111.0	67.0	8.7	66.11	41.5	315.29		
HL 38X203			203	6.66	124.0	79.0	10.3	68.40	49.0	326.21		
HL 38X254			254	5.27	153.0	101.0	13.1	69.20	62.6	330.01		
HL 38X315			315	3.83	190.0	125.0	16.3	62.24	77.5	296.83		
HL 50X64			50	25	64	39.68	42.4	21.6	2.8	111.42	13.4	531.39
HL 50X76					76	31.86	49.2	26.8	3.5	111.00	16.6	529.39
HL 50X89	89	26.56			58.0	31.0	4.0	107.04	19.2	510.48		
HL 50X102	102	22.58			64.0	38.0	4.9	111.55	23.6	531.98		
HL 50X115	115	19.82			72.0	43.0	5.6	110.79	26.7	528.40		
HL 50X127	127	17.49			78.0	49.0	6.4	111.41	30.4	531.35		
HL 50X139	139	15.41			87.0	52.0	6.8	104.17	32.2	496.82		
HL 50X152	152	14.27			93.0	59.0	7.7	109.45	36.6	522.00		
HL 50X178	178	11.99			113.0	65.0	8.5	101.32	40.3	483.20		
HL 50X203	203	10.93			125.0	78.0	10.1	110.83	48.4	528.57		
HL 50X254	254	8.22			153.0	101.0	13.1	107.93	62.6	514.74		
HL 50X315	315	6.44			191.0	124.0	16.1	103.81	76.9	495.11		



H

extra-heavy duty
colour : light brown

Code	Df	Ds	Lo	Rate	Solid Spring		Deflection and Load			
	∅ Hole mm	∅ Rod mm	Free Length mm	Rg Kg/mm	Lb mm	fb mm	Primary 13% fb		Max. Recommended 62% fb	
							mm	Kg	mm	Kg
H 10X25	10	5	25	4.00	18.0	7.0	0.9	3.64	4.3	17.36
H 10X32			32	3.02	22.8	9.2	1.2	3.61	5.7	17.23
H 10X38			38	2.50	27.0	11.0	1.4	3.58	6.8	17.05
H 10X44			44	2.08	31.3	12.7	1.7	3.43	7.9	16.38
H 10X51			51	1.86	34.5	16.5	2.1	3.99	10.2	19.03
H 10X64			64	1.45	43.4	20.6	2.7	3.88	12.8	18.52
H 10X76			76	1.21	51.5	24.5	3.2	3.85	15.2	18.38
H 13X25	13	7	25	6.80	17.9	7.1	0.9	6.28	4.4	29.93
H 13X32			32	5.07	22.5	9.5	1.2	6.26	5.9	29.86
H 13X38			38	4.17	26.5	11.5	1.5	6.23	7.1	29.73
H 13X44			44	3.45	31.0	13.0	1.7	5.83	8.1	27.81
H 13X51			51	3.07	34.5	16.5	2.1	6.59	10.2	31.41
H 13X64			64	2.39	42.5	21.5	2.8	6.68	13.3	31.86
H 13X76			76	1.98	51.4	24.6	3.2	6.33	15.3	30.20
H 13X89			89	1.63	60.0	29.0	3.8	6.15	18.0	29.31
H 13X102			102	1.46	66.6	35.4	4.6	6.72	21.9	32.04
H 16X25	16	8	25	11.36	18.0	7.0	0.9	10.34	4.3	49.30
H 16X32			32	8.38	22.5	9.5	1.2	10.35	5.9	49.36
H 16X38			38	6.84	26.5	11.5	1.5	10.23	7.1	48.77
H 16X44			44	5.63	31.1	12.9	1.7	9.44	8.0	45.03
H 16X51			51	5.00	34.4	16.6	2.2	10.79	10.3	51.46
H 16X64			64	3.87	42.6	21.4	2.8	10.77	13.3	51.35
H 16X76			76	3.21	50.3	25.7	3.3	10.72	15.9	51.15
H 16X89			89	2.74	59.9	29.1	3.8	10.37	18.0	49.44
H 16X102			102	2.36	66.4	35.6	4.6	10.92	22.1	52.09
H 16X115			115	2.09	74.0	41.0	5.3	11.14	25.4	53.13
H 20X25	20	10	25	18.88	18.0	7.0	0.9	17.18	4.3	81.94
H 20X32			32	13.76	22.0	10.0	1.3	17.89	6.2	85.31
H 20X38			38	11.17	26.0	12.0	1.6	17.43	7.4	83.10
H 20X44			44	9.15	30.0	14.0	1.8	16.65	8.7	79.42
H 20X51			51	8.10	33.5	17.5	2.3	18.43	10.9	87.89
H 20X64			64	6.25	41.9	22.1	2.9	17.96	13.7	85.64
H 20X76			76	5.16	49.0	27.0	3.5	18.11	16.7	86.38
H 20X89			89	4.23	58.0	31.0	4.0	17.05	19.2	81.30
H 20X102			102	3.78	64.0	38.0	4.9	18.67	23.6	89.06
H 20X115			115	3.35	70.8	44.2	5.7	19.25	27.4	91.80
H 20X127			127	2.99	81.0	46.0	6.0	17.88	28.5	85.27
H 20X139			139	2.65	87.5	51.5	6.7	17.74	31.9	84.61
H 20X152			152	2.47	94.0	58.0	7.5	18.62	36.0	88.82
H 26X38	26	13	38	21.05	27.0	11.0	1.4	30.10	6.8	143.56
H 26X44			44	17.07	31.5	12.5	1.6	27.74	7.8	132.29
H 26X51			51	15.04	35.0	16.0	2.1	31.28	9.9	149.20
H 26X64			64	11.49	43.0	21.0	2.7	31.37	13.0	149.60
H 26X76			76	9.43	51.2	24.8	3.2	30.40	15.4	145.00
H 26X89			89	7.70	60.0	29.0	3.8	29.03	18.0	138.45
H 26X102			102	6.87	67.0	35.0	4.6	31.26	21.7	149.08
H 26X115			115	6.07	74.0	41.0	5.3	32.35	25.4	154.30
H 26X127			127	5.40	83.0	44.0	5.7	30.89	27.3	147.31
H 26X139			139	4.78	91.5	47.5	6.2	29.52	29.5	140.77
H 26X152			152	4.45	98.0	54.0	7.0	31.24	33.5	148.99
H 26X178			178	3.67	117.0	61.0	7.9	29.10	37.8	138.80
H 26X203			203	3.29	130.0	73.0	9.5	31.22	45.3	148.91



H

extra-heavy duty
colour : light brown

Code	Df	Ds	Lo	Rate	Solid Spring		Deflection and Load			
	∅ Hole mm	∅ Rod mm	Free Length mm	Rg Kg/mm	Lb mm	fb mm	Primary 13% fb		Max. Recommended 62% fb	
							mm	Kg	mm	Kg
H 32X38	32	16	38	35.26	27.3	10.7	1.4	49.05	6.6	233.91
H 32X44			44	28.26	31.5	12.5	1.6	45.92	7.8	219.02
H 32X51			51	24.25	34.8	16.2	2.1	51.07	10.0	243.57
H 32X64			64	18.71	43.0	21.0	2.7	51.08	13.0	243.60
H 32X76			76	15.71	50.0	26.0	3.4	53.10	16.1	253.25
H 32X89			89	12.42	59.0	30.0	3.9	48.44	18.6	231.01
H 32X102			102	11.04	65.0	37.0	4.8	53.10	22.9	253.26
H 32X115			115	9.75	72.5	42.5	5.5	53.87	26.4	256.91
H 32X127			127	8.65	83.0	44.0	5.7	49.48	27.3	235.97
H 32X139			139	7.64	92.0	47.0	6.1	46.68	29.1	222.63
H 32X152			152	7.10	98.0	54.0	7.0	49.84	33.5	237.71
H 32X178			178	5.85	116.0	62.0	8.1	47.15	38.4	224.87
H 32X203			203	5.24	129.0	74.0	9.6	50.41	45.9	240.41
H 32X254			254	4.15	160.0	94.0	12.2	50.71	58.3	241.86
H 32X315	315	3.26	205.0	110.0	14.3	46.62	68.2	222.33		
H 38X51	38	20	51	44.80	36.0	15.0	2.0	87.36	9.3	416.64
H 38X64			64	33.20	43.7	20.3	2.6	87.61	12.6	417.86
H 38X76			76	26.79	51.0	25.0	3.3	87.07	15.5	415.25
H 38X89			89	21.59	61.0	28.0	3.6	78.59	17.4	374.80
H 38X102			102	19.11	67.0	35.0	4.6	86.95	21.7	414.69
H 38X115			115	16.80	74.0	41.0	5.3	89.54	25.4	427.06
H 38X127			127	14.86	83.0	44.0	5.7	85.00	27.3	405.38
H 38X139			139	13.10	93.0	46.0	6.0	78.34	28.5	373.61
H 38X152			152	12.15	100.0	52.0	6.8	82.13	32.2	391.72
H 38X178			178	9.97	118.0	60.0	7.8	77.77	37.2	370.88
H 38X203			203	8.90	130.0	73.0	9.5	84.46	45.3	402.81
H 38X254			254	7.02	162.0	92.0	12.0	83.96	57.0	400.42
H 38X315			315	5.51	202.0	113.0	14.7	80.94	70.1	386.03
H 50X64			50	25	64	64.31	45.0	19.0	2.5	158.85
H 50X76	76	51.44			52.7	23.3	3.0	155.81	14.4	743.10
H 50X89	89	41.30			62.0	27.0	3.5	144.96	16.7	691.36
H 50X102	102	35.74			68.2	33.8	4.4	157.04	21.0	748.97
H 50X115	115	31.53			77.0	38.0	4.9	155.76	23.6	742.85
H 50X127	127	27.50			85.0	42.0	5.5	150.15	26.0	716.10
H 50X139	139	23.86			95.0	44.0	5.7	136.48	27.3	650.90
H 50X152	152	22.15			100.0	52.0	6.8	149.73	32.2	714.12
H 50X178	178	18.58			120.0	58.0	7.5	140.09	36.0	668.14
H 50X203	203	16.50			132.0	71.0	9.2	152.30	44.0	726.33
H 50X254	254	13.30			163.0	91.0	11.8	157.34	56.4	750.39
H 50X315	315	10.48			205.0	110.0	14.3	149.86	68.2	714.74