

Flat Springs

Straight / 1 Point Bend Type / 2 Point Bend Type

Straight



1 Point Bend Type



2 Point Bend Type



IBN (Stainless Steel)



IBNW



IBNS (Stainless Steel)



(Side View of Development)

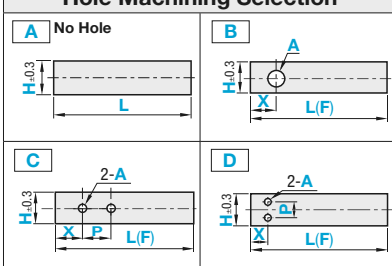


Due to low temperature annealing, surface color is golden brown.

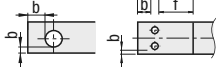
Due to low temperature annealing, surface color is golden brown.

T	Tolerance
0.2	±0.02
0.3	±0.025
0.4	±0.025
0.5	±0.035
0.6	±0.035
0.7	±0.040
0.8	±0.040

Hole Machining Selection



Machining Limits



1. The distance between the hole and the edge should be 1.5mm or more.
2. The distance between holes and bends should be 3mm or more.

IBN Straight

Part Number	Type	Shape	T Selection	H	L	A	0.5mm Increment	Unit Price
					1mm Increment	Selection	X	P
IBN	A	B	0.2 0.3 0.4 0.5	6		2.0		
	C	D	0.2 0.3 0.4 0.5	8		2.5		
			0.3 0.4 0.5 0.6	10		3.0		
			0.3 0.4 0.5 0.6	12		3.5		
			0.4 0.5 0.6 0.7	15		4.5		
			0.4 0.5 0.6 0.7	18		5.5		
			0.5 0.6 0.7 0.8	21		6.5		
			0.5 0.6 0.7 0.8	25		9.0		

Ordering Example: Part Number - T - H - L - A - X - P
IBN A - T0.2 - H8 - L20
IBN C - T0.2 - H8 - L20 - A3.5 - X5 - P10

IBNS 1 Point Bend Type

Part Number	Type	Shape	T Selection	H	L	A	0.5mm Increment	5° Increment
					1mm Increment	Selection	X	P
IBNS	A	B	0.2 0.3 0.4 0.5	6		2.0		
	C	D	0.2 0.3 0.4 0.5	8		2.5		
			0.3 0.4 0.5 0.6	10		3.0		
			0.3 0.4 0.5 0.6	12		3.5		
			0.4 0.5 0.6 0.7	15		4.5		
			0.4 0.5 0.6 0.7	18		5.5		
			0.5 0.6 0.7 0.8	21		6.5		
			0.5 0.6 0.7 0.8	25		9.0		

Ordering Example: Part Number - T - H - L - A - X - P - F - Q
IBNS B - T0.6 - H15 - L200 - A3.5 - X20 - F50 - Q30
IBNS C - T0.3 - H12 - L40 - A3.5 - X5 - P10 - F20 - Q45

IBNW 2 Point Bend Type

Part Number	Type	Shape	T Selection	H	L	A	0.5mm Increment	Unit Price
					1mm Increment	Selection	X	P
IBNW	A	B	0.2 0.3 0.4 0.5	6		2.0		
	C	D	0.2 0.3 0.4 0.5	8		2.5		
			0.3 0.4 0.5 0.6	10		3.0		
			0.3 0.4 0.5 0.6	12		3.5		
			0.4 0.5 0.6 0.7	15		4.5		
			0.4 0.5 0.6 0.7	18		5.5		
			0.5 0.6 0.7 0.8	21		6.5		
			0.5 0.6 0.7 0.8	25		9.0		

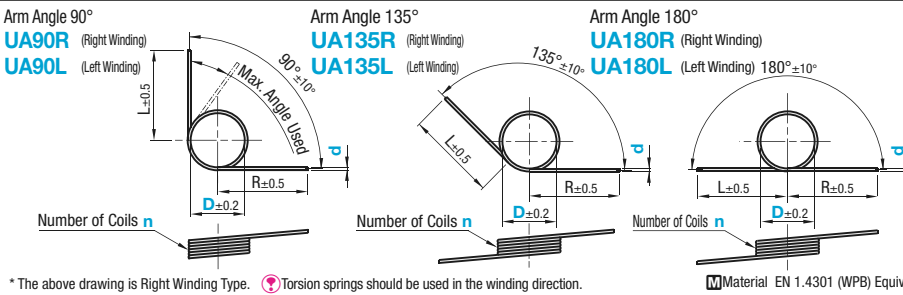
Ordering Example: Part Number - T - H - F - E - G - Q - R - A - X - P
IBNW B - T0.6 - H10 - F35 - E10 - G15 - Q10 - R90 - A3.0 - X5
IBNW C - T0.5 - H15 - F50 - E20 - G40 - Q90 - R85 - A3.5 - X7 - P15

Torsion Springs

Right Winding 90°



Left Winding 180°



* The above drawing is Right Winding Type. Torsion springs should be used in the winding direction.

Material EN 1.4301 (WPB) Equiv.

Part Number		Number of Winding n	Wire Dia. d	Arm Length L/R	Spring Constant (Torque) N · mm/deg			Max. Angle Used Deg (deg)			Unit Price
Type	I. D				Arm Angle 90°	Arm Angle 135°	Arm Angle 180°	Arm Angle 90°	Arm Angle 135°	Arm Angle 180°	
Arm Angle 90° UA90R (Right Winding) UA90L (Left Winding)	2	2	0.2	20	0.0115	0.0119	0.0124	41	40	36	
			0.3		0.0563	0.0586	0.0611	26	25	23	
		3	0.2		0.0088	0.0090	0.0093	59	58	56	
			0.3		0.0428	0.0441	0.0455	38	36	35	
		4	0.3		0.0345	0.0354	0.0363	52	50	47	
	0.4		0.1054	0.1080	0.1108	38	36	34			
	3	2	0.3	0.0289	0.0295	0.0302	61	60	58		
			0.4	0.0882	0.0900	0.0920	46	45	43		
		3	0.3	0.0387	0.0403	0.0420	40	38	36		
			0.4	0.1199	0.1248	0.1301	30	27	25		
		4	0.3	0.0295	0.0304	0.0314	56	54	52		
	0.4		0.0912	0.0940	0.0970	42	40	39			
Arm Angle 135° UA135R (Right Winding) UA135L (Left Winding)	4	3	0.4	0.0736	0.0755	0.0774	55	53	51		
			0.5	0.1756	0.1799	0.1845	44	42	41		
		5	0.4	0.0617	0.0630	0.0643	71	68	66		
			0.5	0.1471	0.1501	0.1533	54	53	51		
		2	0.4	0.0918	0.0955	0.0996	39	37	34		
	0.5		0.2206	0.2296	0.2394	29	28	27			
	5	3	0.4	0.0700	0.0722	0.0744	56	54	52		
			0.5	0.1680	0.1732	0.1787	42	41	40		
		4	0.5	0.1357	0.1390	0.1425	57	54	52		
			0.6	0.2763	0.2831	0.2903	48	47	45		
		Arm Angle 180° UA180R (Right Winding) UA180L (Left Winding)	5	2	0.5	0.1138	0.1161	0.1185	69	67	65
	0.6				0.2315	0.2363	0.2413	60	59	58	
3	0.5			0.1793	0.1866	0.1944	39	36	34		
	0.6			0.3672	0.3821	0.3983	31	30	27		
4	0.5			0.1368	0.1409	0.1454	55	52	51		
	0.6		0.2797	0.2883	0.2974	47	44	42			
6	3		0.6	0.2259	0.2314	0.2373	60	58	56		
			0.8	0.6936	0.7108	0.7289	42	41	40		
	4		0.6	0.1894	0.1933	0.1974	75	73	71		
			0.8	0.5811	0.5931	0.6056	54	53	52		
	7		2	0.6	0.3099	0.3224	0.3360	37	36	34	
0.8				0.9590	0.9981	1.0406	26	25	24		
3		0.6	0.2363	0.2436	0.2512	56	52	50			
		0.8	0.7299	0.7523	0.7762	38	36	35			
4		0.8	0.5891	0.6037	0.6190	50	48	47			
	1.0	1.4045	1.4394	1.4760	42	40	39				
8	5	0.8	0.4939	0.5041	0.5147	63	61	60			
		1.0	1.1765	1.2008	1.2262	51	50	49			

1N=0.101972kgf
1 deg = 1°(Angle)

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1 deg = 1°(Angle)

Alterations: Part Number - n - d - (LC, RC, LBC, RBC)
UA90R4 - 3 - 0.5 - LC12-RC15-LBC90-LZ5

Alterations	Arm Cut	Bend Left Arm	Bend Right Arm
Code	LC	LBC	RBC
Spec.			
	Cuts arm down to the length of LC or RC. LC≥3, RC≥3 1mm Increment Ordering Code LC12	•LBC---Specifies the angle (see the diagram above) Select from RBC0, LBC90, LBC180 and LBC270. •LZ-----Specifies the position (1mm increment) LZ≥3 L-LZ≥3 Ordering Code LBC90-LZ10	•RBC---Specifies the angle (see the diagram above) Select from RBC0, RBC90, RBC180 and RBC270. •RZ-----Specifies the position (1mm increment) RZ≥3 R-RZ≥3 Ordering Code RBC90-RZ10

Constant Force Springs / Brackets for Constant Force Springs

Washers for Coil Springs

Standard / Tapped

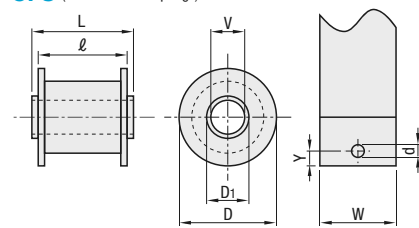
Constant Force Springs



Brackets for Constant Force Springs

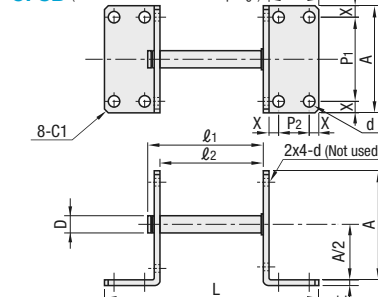


CFS (Constant Force Springs)



Material	
Main Body	Drum
EN 1.4319 Equiv.	Polypropylene
Material of the Drums: CFS0.1, CFS0.2 and CFS5.2 are polyethylene, CFS3.5 is ABS.	

CFSB (Brackets for Constant Force Springs)



Material		Surface Treatment	Accessory
Main Body	Shaft	Shaft	
EN 1.4016 Equiv.	EN 1.0038 Equiv.	Nickel Plating	Retaining Ring-C Type (EN 1.4301 Equiv.)

Part Number		Max.	Durability	Spring Rate	Accessory	D	D1	V	ℓ	L	W	D	Y	Unit Price	Volume	Discount Rate			
Type	Load (kg)	Stroke	Times	Thickness	Plate Thickness									1-19 pcs	20-34	35-49	50-100		
CFS	0.1	500	50,000	0.1	1.0	26	8.2	5.2	17	18	10	3.2	5						
	0.2		35,000	0.13															
	0.4	1,000	37,000			34	13	25.6	27.6	20									
	0.6		25,000	0.15															
	0.8	1,500	25,000			34		30.6	32.6	25									
	1.0	1,000	19,000	38		14	25.6	27.6	20										
	1.2	1,500	34,000	44			40.6	42.6	35										
	1.4	1,000	9,000	34		13	25.6	27.6	20	4.5									
	1.8	1,500	9,000	34			30.6	32.6	25										
	2.0		6,000	0.25		38		25.6	27.6	20									
	2.2		8,000	0.3		44	14												
	2.4		6,000	0.25		38		10.2											
	2.6		9,000			44		30.6	32.6	25									
	2.9	1,000	20,000			2.0	54	16	46	49	40	6.5							
	3.2		8,000	0.3		1.0	44	14	35.6	37.6	30	4.5							
	3.5		21,000			2.0	54	16	56	58	50	6.5							
	3.9		8,000			1.0	44	14	40.6	42.6	35	4.5							
	4.7		9,000			2.0	44	14	50.6	52.6	45	6.5							
5.2	1,500	6,000	0.45	1.0	60	16	37	40	30	4.5									
5.7	1,000	8,000	0.3	2.0	44	14	55.6	57.6	50	6.5									

Part Number	t	A	B	P1	P2	X	d	D	ℓ1	ℓ2	L	Applicable Constant Force Spring	Unit Price (1-19 pcs)	Volume Discount Rate 20-34	35-49	50-100
Type	No.															
CFSB	0.1	1.5	45	22.5	35	12.5	5	4.5	5	24.5	20.5	68.5	CFS0.1 CFS0.2			
	0.4	55	27.5	43	15.5				34.9	30.4	89.4	CFS0.4 CFS0.6 CFS1.4				
	0.8	55	27.5	43	15.5				39.9	35.4	94.4	CFS0.8 CFS1.8				
	1.0	60	30	48	18				34.9	30.4	94.4	CFS1.0 CFS2.0				
	1.2	65	32.5	53	20.5				49.9	45.4	114.4	CFS1.2 CFS3.9				
	2.2	65	32.5	53	20.5				34.9	30.4	99.4	CFS2.2				
	2.4	60	30	48	18				39.9	35.4	99.4	CFS2.4				
	2.6	65	32.5	53	20.5				10	39.9	35.4	104.4	CFS2.6			
	2.9	75	37.5	63	25.5				56.3	51.8	130.8	CFS2.9				
	3.2	65	32.5	53	20.5				44.9	40.4	109.4	CFS3.2				
	3.5	75	37.5	63	25.5				65.3	60.8	139.8	CFS3.5				
	4.7	65	32.5	53	20.5				59.9	55.4	124.4	CFS4.7				
	5.2	2.5	85	42.5	71	28.5	7	6.5		47.3	42.3	132.3	CFS5.2			
5.7	2	65	32.5	53	20.5	6	5.5		64.9	60.4	129.4	CFS5.7				

Ordering Example
Part Number
CFS2.4
CFSB2.4

All load tolerances are from 0 to +15%.

Features

- A long strip of material that is wound into a role. When the strip is extended, the inherent stress resists the loading force at a constant rate.
- Once it reaches the maximum load, the resistance is constant regardless of the stroke. (The drums reach the max. loads only after a half rotation.)

How to Use

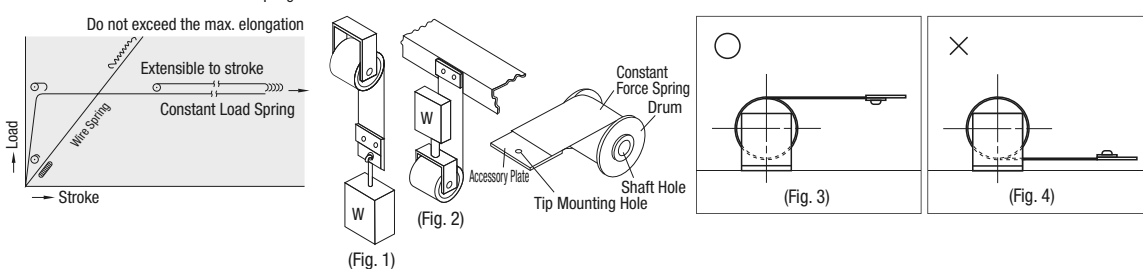
- The side on which a shaft goes through the drum is regarded as one end, and the accessory plate side as the other end. Mount with screws using mounting holes of the accessory plate.
- Can be used in either way of fixing the body and pulling out the accessory plate (Fig. 1) or fixing the accessory plate and pulling out the body (Fig. 2).

Cautions on Use

- Springs are coiled around a drum without a stopper inside. Do not pull out the stroke beyond the specified length: the spring may come off of the drum.
- If a suitable load constant force spring can not be found, select a value one step higher and adjust using a counterweight on the mating load.
- They can be used even with extra length if it's within the stroke range.
- Durability is as shown in specification table. A set of extension and contraction is counted as one cycle. If durability expectancy is exceeded, load capacity may decrease and cracks may appear partly on the spring surface. Continuous use under such condition is dangerous. If used in pairs, both will reach the end of their service life at the same time. Please replace both of them at the same time.
- After prestressing of springs (5 ~ 10 sets of extension and contraction over the entire stroke) the load will be stable. Load capacity may be higher before prestressing.

Cautions on Installation

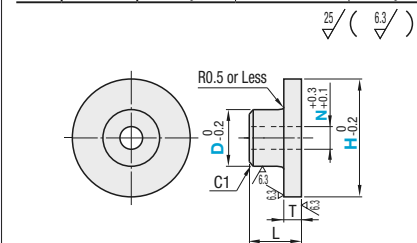
- Make sure the spring doesn't contact other structures.
- Spring draw direction should be perpendicular to the shaft axis.
- Make sure a spring doesn't contact the accessory plate when retracting.
- Set the spring so that it can be pulled out horizontally at any time in order to avoid deflection (bending).
- If drum and shaft do not rotate smoothly, the spring will deteriorate due to excessive force.
- When using brackets, orient in the position as shown in Fig. 3. Orienting in the position as shown in Fig. 4 may cause the spring to contact the brackets and allow foreign objects such as dust inside. This will deteriorate the spring.



Standard



Type	Material	Surface Treatment	Color
SPGCC	EN 1.1191 Equiv.	Black Oxide	-
SPGCS	EN 1.4301 Equiv.	-	-
SPGCJ	Polyacetal	-	White
SPGCK	Polyacetal	-	Black
SPGCM	MC Nylon	-	Blue
SPGCW	MC Nylon	-	Ivory

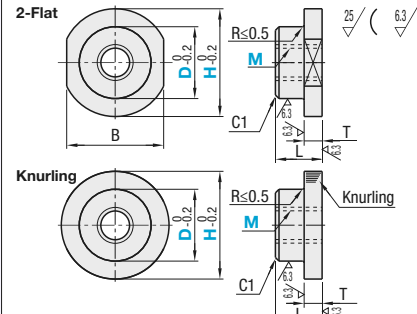


Ordering Example
Part Number - D - N
SPGCS20 - 9 - 6
SPGCC10 - 6 - 3

Tapped

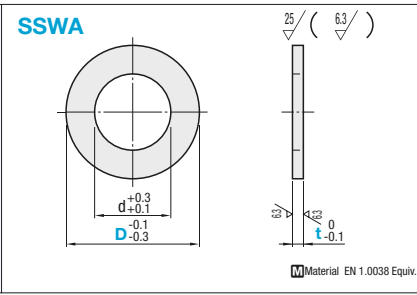


Type	Material	Surface Treatment
2-Flat	EN 1.1191 Equiv.	Black Oxide
Knurling	EN 1.4301 Equiv.	-
SPGMC		
SPGRS		



Ordering Example
Part Number - D - M
SPGMC20 - 16 - 6
SPGRS25 - 20 - 12

Washers



Ordering Example
Part Number - t
SSWA15 - 2.0

Part Number		1mm Increment	Selection	L	T	Unit Price	
Type	H	D	N			SPGCC	SPGCS
(Metal) SPGCC SPGCS	8	6	3	5	2		
	10	6~8	3				
			4				
	12	7~10	4				
			5				
			6	6			
	15	7~13	4				
			5				
			6				
			8				
			10				
			6	3			
	20	9~17	8				
			10				
			12				
			8	8			
	25	11~22	10				
			12				
			16				
	30	15~25	12	5			

D-N≥3

Part Number		1mm Increment D	Selection N	L	T	Unit Price					
Type	H					SPGCJ SPGCK	SPGCM SPGCW				
(Resin) SPGCJ SPGCK SPGCM SPGCW	10	6~8	3	6	3						
			4								
	15	7~13	4	7							
			5								
	20	9~17	6	10							
			8								
	25	11~22	10	12							
			8								
	30	15~25	12	16							
			10								

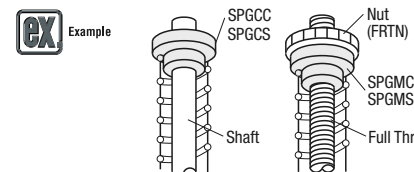
D-N≥3

Part Number		1mm Increment	Selection M (Course)	L	T	B	SPGMC		SPGMS	
Type	H	D					Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate
(2-Flat) SPGMC SPGMS	10	7-8	4	8	3	8	1-9 pcs	10-50	1-9 pcs	10-50
	15	7-13	4 6	8	3	13				
	20	9-17	4 6 8 10	8	3	17				
	25	12-20	4 6 8 10 12	10	5	22				
	30	16-25	6 8 10 12 16	10	5	27				

D-M≥3

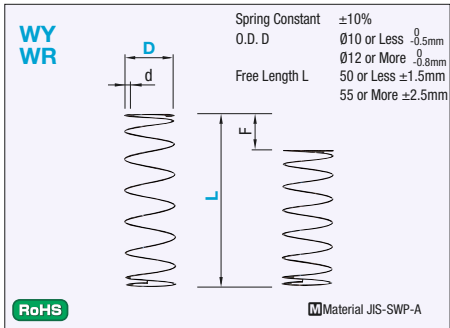
Part Number		1mm Increment	Selection	L	T	SPGRS		SPGRS	
Type	H	D	M (Course)			Unit Price	Volume Discount Rate	Unit Price	Volume Discount Rate
(Knurling) SPGRS SPGRS	10	7-8	4	8	3	1-9 pcs.	10-50	1-9 pcs.	10-50
	15	7-13	4 6	8	3				
	20	9-17	4 6 8 10	8	3				
	25	12-20	4 6 8 10 12	10	5				
	30	16-25	6 8 10 12 16	10	5				

D-M≥3



Round Coil Springs

WY, WR: O.D. Referenced



Ordering Example
Part Number
WY13-60

Spring Constant

⚠ D12 and 14 for WY Type and D12,14 and 20 for WT Type are not available.

Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5{0.05}				3.9{0.4}
3					1.5{0.15}	2.0{0.2}	2.9{0.3}	4.9{0.5}
4	N/mm 0.1 {kgf/mm {0.01}}					N/mm 5.9 {kgf/mm {0.6}}	N/mm 9.8 {kgf/mm {1.0}}	
5		N/mm 0.3 {kgf/mm {0.03}}	N/mm 0.5 {kgf/mm {0.05}}	N/mm 1.0 {kgf/mm {0.1}}	N/mm 2.0 {kgf/mm {0.2}}	N/mm 2.9 {kgf/mm {0.3}}	N/mm 9.8 {kgf/mm {1.0}}	
6								
8								
10	N/mm 0.2 {kgf/mm {0.02}}						N/mm 19.6 {kgf/mm {2.0}}	
12								
13								
14								
16								
18		N/mm 0.5 {kgf/mm {0.05}}	N/mm 1.0 {kgf/mm {0.1}}	N/mm 2.9 {kgf/mm {0.3}}	N/mm 3.9 {kgf/mm {0.4}}	N/mm 4.9 {kgf/mm {0.5}}	N/mm 14.7 {kgf/mm {1.5}}	29.4{3.0}
20								
22								
27								
Fmax.	F=L×75%	F=L×60%	F=L×45%	F=L×40%	F=L×40%	F=L×35%	F=L×30%	F=L×25%

WY: Fmax. (Allowable Deflection) =Lx75%

d	Solid Length	F max.	Load N(kgf) max.	Part Number Type D-L	Unit Price 10 - 19 pcs.
0.16	1.0	3.75	0.38{0.04}	WY3- 5	
0.2	2.0	7.5	0.75{0.08}	10	
0.23	3.6	11.2	1.12{0.11}	15	
0.23	3.6	15	1.5{0.15}	20	
0.25	5.5	18.7	1.87{0.19}	25	
0.26	6.5	22.5	2.25{0.23}	30	
0.2	1.1	3.75	0.38{0.04}	WY4- 5	
0.23	1.9	7.5	0.7{0.08}	10	
0.23	1.9	11.2	1.1{0.11}	15	
0.25	2.7	15	1.5{0.15}	20	
0.29	5	18.7	1.8{0.19}	25	
0.29	5	22.5	2.2{0.23}	30	
0.32	7.7	26.2	2.6{0.26}	35	
0.32	7.7	30	2.9{0.3}	40	
0.25	1.7	7.5	0.7{0.08}	WY5- 10	
0.25	1.7	11.2	1.1{0.11}	15	
0.3	3.2	15	1.5{0.15}	20	
0.3	3.2	18.7	1.8{0.19}	25	
0.35	6.3	22.5	2.2{0.23}	30	
0.35	6.3	26.2	2.6{0.26}	35	
0.38	9.2	30	2.9{0.3}	40	
0.38	9.2	33.7	3.3{0.34}	45	
0.38	9.2	37.5	3.7{0.38}	50	
0.3	2.1	7.5	0.75{0.08}	WY6- 10	
0.32	2.8	11.2	1.1{0.11}	15	
0.32	2.8	15	1.5{0.15}	20	
0.35	4.1	18.7	1.8{0.19}	25	
0.38	5.6	22.5	2.2{0.23}	30	
0.38	5.6	26.2	2.6{0.26}	35	
0.4	7.2	30	2.9{0.3}	40	
0.4	7.2	33.7	3.3{0.34}	45	
0.4	7.2	37.5	3.7{0.38}	50	
0.45	12.2	41.2	4.0{0.41}	55	
0.45	12.2	45	4.4{0.45}	60	
0.45	12.2	48.7	4.8{0.49}	65	
0.45	12.2	52.5	5.1{0.53}	70	

d	Solid Length	F max.	Load N(kgf) max.	Part Number Type D-L	Unit Price 10 - 19 pcs.
0.35	2.1	7.5	0.75{0.08}	WY8- 10	
0.38	3	11.2	1.1{0.11}	15	
0.4	3.5	15	1.5{0.15}	20	
0.4	3.5	18.7	1.8{0.19}	25	
0.45	5.7	22.5	2.2{0.23}	30	
0.45	5.7	26.2	2.6{0.26}	35	
0.45	5.7	30	2.9{0.3}	40	
0.45	5.7	33.7	3.3{0.34}	45	
0.45	5.7	37.5	3.7{0.38}	50	
0.5	9	37.5	3.7{0.38}	50	
0.5	9	41.2	4.0{0.41}	55	
0.5	9	45	4.4{0.45}	60	
0.5	9	48.7	4.8{0.49}	65	
0.5	9	52.5	5.1{0.53}	70	
0.5	3	11.2	2.26{0.23}	WY10- 15	
0.55	4.6	15	2.9{0.3}	20	
0.55	4.6	18.7	3.7{0.37}	25	
0.6	6.6	22.5	4.4{0.45}	30	
0.6	6.6	26.2	5.1{0.52}	35	
0.65	9.1	30	5.9{0.6}	40	
0.65	9.1	33.7	6.6{0.67}	45	
0.65	9.1	37.5	7.4{0.75}	50	
0.65	9.1	41.2	8.1{0.82}	55	
0.65	9.1	45	8.8{0.9}	60	
0.65	9.1	48.7	9.6{0.97}	65	
0.9	11.3	37.5	7.4{0.75}	50	
0.9	11.3	41.2	8.1{0.82}	55	
0.9	11.3	45	8.8{0.9}	60	
0.9	11.3	48.7	9.6{0.97}	65	
0.9	11.3	52.5	10.3{1.05}	70	

• Load calculation method = Spring constant x Deflection (Int'l Unit)
N=N/mmxFmm
kgf=kgf/mmxFmm
(kgf=Nx0.101972)

- ⚠ Both ends of WY Type springs are not ground.
- ⚠ The values of solid length are for reference only. There may be some variations depending on the lot.
- ⚠ Usage Count: 1 Million Times
- ⚠ Product Outline **P327**
- ⚠ How to use coil springs, and precautions **P328**

WR: Fmax. (Allowable Deflection) = Lx60%

d	Solid Length	F max.	Load N(kgf) max.	Part Number Type D-L	Unit Price 10 - 19 pcs.
0.23	1.8	3	0.9{0.09}	WR3- 5	
0.25	2.3	6	1.8{0.18}	10	
0.3	4.8	9	2.6{0.27}	15	
0.3	4.8	12	3.5{0.36}	20	
0.32	6.8	15	4.4{0.45}	25	
0.32	6.8	18	5.3{0.54}	30	
0.35	11.5	21	6.2{0.63}	35	
0.35	11.5	24	7.1{0.72}	40	
0.35	11.5	24	7.1{0.72}	40	
0.26	1.6	3	0.9{0.09}	WR4- 5	
0.29	2.2	6	1.8{0.18}	10	
0.32	3.2	9	2.6{0.27}	15	
0.38	6.5	12	3.5{0.36}	20	
0.38	6.5	15	4.4{0.45}	25	
0.4	8.4	18	5.3{0.54}	30	
0.4	8.4	21	6.2{0.63}	35	
0.45	15	24	7.1{0.72}	40	
0.45	15	27	7.9{0.81}	45	
0.45	15	30	8.8{0.9}	50	
0.45	15	33	9.7{0.99}	55	
0.5	23.5	36	10.6{1.08}	60	
0.5	25	39	11.5{1.17}	65	
0.5	25	42	12.4{1.26}	70	
0.3	1.6	3	0.9{0.09}	WR5- 5	
0.35	2.8	6	1.8{0.18}	10	
0.35	2.8	9	2.6{0.27}	15	
0.4	4.8	12	3.5{0.36}	20	
0.45	8	15	4.4{0.45}	25	
0.45	8	18	5.3{0.54}	30	
0.5	12.5	21	6.2{0.63}	35	
0.5	12.5	24	7.1{0.72}	40	
0.55	17.6	27	7.9{0.81}	45	
0.55	18	30	8.8{0.9}	50	
0.55	20	33	9.7{0.99}	55	
0.55	20	36	10.6{1.08}	60	
0.55	20.9	39	11.5{1.2}	65	
0.55	20.9	42	12.4{1.3}	70	
0.32	1.6	3	0.9{0.09}	WR6- 5	
0.4	3.2	6	1.8{0.18}	10	
0.4	3.2	9	2.6{0.27}	15	
0.5	7.5	12	3.5{0.36}	20	
0.5	7.5	15	4.4{0.45}	25	
0.5	7.5	18	5.3{0.54}	30	
0.55	11.5	21	6.2{0.63}	35	
0.55	11.5	24	7.1{0.72}	40	
0.6	17.4	27	7.9{0.81}	45	
0.6	17.4	30	8.8{0.9}	50	
0.6	17.4	33	9.7{0.99}	55	
0.6	17.4	36	10.6{1.08}	60	
0.6	17.4	39	11.5{1.17}	65	
0.6	17.4	42	12.4{1.26}	70	
0.65	27.3	48	14.1{1.4}	80	
0.45	2.7	6	1.8{0.18}	WR8- 10	
0.5	4	9	2.6{0.27}	15	
0.5	4	12	3.5{0.36}	20	
0.55	5.8	15	4.4{0.45}	25	
0.6	8.4	18	5.3{0.54}	30	
0.6	8.4	21	6.2{0.63}	35	
0.6	8.4	24	7.1{0.72}	40	
0.7	16	27	7.9{0.81}	45	
0.7	16	30	8.8{0.9}	50	
0.7	16	33	9.7{0.99}	55	
0.7	16	36	10.6{1.08}	60	
0.7	16	39	11.5{1.17}	65	
0.7	16	42	12.4{1.26}	70	
0.75	22.9	48	14.1{1.4}	80	

• Load calculation method = Spring constant x Deflection (Int'l Unit)
N=N/mmxFmm
kgf=kgf/mmxFmm
(kgf=Nx0.101972)

- ⚠ Both ends of WR Type springs are not ground.
- ⚠ The values of solid length are for reference only. There may be some variations depending on the lot.
- ⚠ Usage Count: 1 Million Times
- ⚠ Product Outline **P327**
- ⚠ How to use coil springs, and precautions **P328**

d	Solid Length	F max.	Load N(kgf) max.	Part Number Type D-L	Unit Price 10 - 19 pcs.
0.75	4.5	9	2.6{0.27}	WR16- 15	
0.8	5.6	12	3.5{0.36}	20	
0.9	8	15	4.4{0.45}	25	
0.9	8	18	5.3{0.54}	30	
0.9	8	21	6.2{0.63}	35	
1.0	13	24	7.1{0.72}	40	
1.0	13	27	7.9{0.81}	45	
1.0	13	30	8.8{0.9}	50	
1.0	13	33	9.7{0.99}	55	
1.1	20	36	10.6{1.08}	60	
1.1	20	39	11.5{1.17}	65	
1.1	20	42	12.4{1.26}	70	
1.1	20	48	14.1{1.4}	80	
1.2	28.8	54	15.9{1.62}	90	
1.0	7	12	5.8{0.6}	WR18- 20	
1.0	7	15	7.4{0.75}	25	
1.1	9.9	18	8.8{0.9}	30	
1.1	9.9	21	10.3{1.05}	35	
1.2	14.4	24	11.8{1.2}	40	
1.2	14.4	27	13.2{1.35}	45	
1.2	14.4	30	14.7{1.5}	50	
1.3	19.5	33	16.2{1.65}	55	
1.3	19.5	36	17.7{1.8}	60	
1.3	19.5	39	19.1{1.95}	65	
1.3	19.5	42	20.6{2.1}	70	
1.4	27.3	48	23.5{2.4}	80	
1.0	6	12	5.8{0.6}	WR20- 20	
1.1	8.3	15	7.4{0.75}	25	
1.1	8.3	18	8.8{0.9}	30	
1.2	10.8	21	10.3{1.05}	35	
1.2	10.8	24	11.8{1.2}	40	
1.2	10.8	27	13.2{1.35}	45	
1.3	15	30	14.7{1.5}	50	
1.3	15	33	16.2{1.65}	55	
1.3	15	36	17.7{1.8}	60	
1.3	15	39	19.1{1.95}	65	
1.4	21	42	20.6{2.1}	70	
1.4	21	48	23.5{2.4}	80	
1.1	6.9	12	5.9{0.6}	WR22- 20	
1.2	9	15	7.4{0.75}	25	
1.2	9	18	8.8{0.9}	30	
1.3	12.4	21	10.3{1.05}	35	
1.3	12.4	24	11.8{1.2}	40	
1.3	12.4	27	13.2{1.35}	45	
1.4	16.1	30	14.7{1.5}	50	
1.4	16.1	33	16.2{1.65}	55	
1.4	16.1	36	17.7{1.8}	60	
1.5	22.5	39	19.1{1.95}	65	
1.5	22.5	42	20.6{2.1}	70	
1.5	22.5	48	23.5{2.4}	80	
1.3	8.5	18	8.8{0.9}	WR27- 30	
1.4	10.5	21	10.3{1.05}	35	
1.4	10.5	24	11.8{1.2}	40	
1.4	10.5	27	13.2{1.35}	45	
1.6	17.6	30	14.7{1.5}	50	
1.6	17.6	33	16.2{1.65}	55	
1.6	17.6	36	17.7{1.8}	60	
1.7	22.1	39	19.1{1.95}	65	
1.7	22.1	42	20.6{2.1}	70	
1.7	22.1	48	23.5{2.4}	80	

Round Coil Springs

WF, WL: O.D. Referenced



Ordering
Example

Part Number

WF13-60

WF
WL



Spring Constant $\pm 10\%$
O.D. D $\begin{matrix} \text{Ø10 or Less } \frac{0}{-0.5\text{mm}} \\ \text{Ø12 or More } \frac{0}{-0.8\text{mm}} \end{matrix}$
Free Length L $\begin{matrix} 50 \text{ or Less } \pm 1.5\text{mm} \\ 55 \text{ or More } \pm 2.5\text{mm} \end{matrix}$

RoHS

Material JIS-SWP-A

Spring Constant

⚠ D12 and 14 for WY Type and D12,14 and 20 for WT Type are not available.

Type	WY	WR	WF	WL	WT	WM	WH	WB
D				0.5{0.05}				
2								
3								
4								
5								
6								
8								
10	N/mm 0.1 {kgf/mm} {0.01}	N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	1.5 {0.15}	2.0 {0.2}	2.9{0.3}	3.9{0.4}
12	N/mm 0.2 {kgf/mm} {0.02}				N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
13							N/mm 9.8 {kgf/mm} {1.0}	N/mm 19.6 {kgf/mm} {2.0}
14								
16								
18								
20		N/mm 3.9 {kgf/mm} {0.05}	N/mm 4.9 {kgf/mm} {0.1}	N/mm 3.9 {kgf/mm} {0.3}	N/mm 4.9 {kgf/mm} {0.4}	N/mm 5.9 {kgf/mm} {0.5}	N/mm 14.7 {kgf/mm} {1.5}	29.4{3.0}
22								
27								
Fmax.	F=Lx75%	F=Lx60%	F=Lx45%	F=Lx40%	F=Lx40%	F=Lx35%	F=Lx30%	F=Lx25%

WF: Fmax. (Allowable Deflection) =Lx45%

d	Solid Length	F max.	Load N{kgf} max.	Part Number	Unit Price
Type D-L				Type D-L	10 ~ 19 pcs.
0.26 2	2.25	1.1{0.11}	1.1{0.11}	WF3- 5*	
0.32 5	4.5	2.2{0.22}	2.2{0.22}	10*	
0.32 5	6.7	3.2{0.33}	3.2{0.33}	15*	
0.35 7	9	4.4{0.45}	4.4{0.45}	20*	
0.35 7	11.2	5.5{0.56}	5.5{0.56}	25*	
0.4 13.2	13.5	6.6{0.67}	6.6{0.67}	30	
0.4 13.2	15.7	7.6{0.78}	7.6{0.78}	35	
0.4 13.2	18	8.8{0.9}	8.8{0.9}	40	
0.32 2.3	2.25	1.1{0.11}	1.1{0.11}	WF4- 5*	
0.35 3.1	4.5	2.2{0.22}	2.2{0.22}	10*	
0.4 5.6	6.7	3.2{0.33}	3.2{0.33}	15*	
0.4 5.6	9	4.4{0.45}	4.4{0.45}	20*	
0.45 9.9	11.2	5.5{0.56}	5.5{0.56}	25*	
0.45 9.9	13.5	6.6{0.67}	6.6{0.67}	30*	
0.5 16.5	15.7	7.6{0.78}	7.6{0.78}	35	
0.5 16.5	18	8.8{0.9}	8.8{0.9}	40	
0.5 16.5	20	9.8{1.0}	9.8{1.0}	45	
0.5 16.5	22.5	10.8{1.1}	10.8{1.1}	50	
0.5 16.5	24.7	12.1{1.23}	12.1{1.23}	55	
0.5 16.5	27	12.7{1.3}	12.7{1.3}	60	
0.55 26.4	29.2	14.3{1.46}	14.3{1.46}	65*	
0.55 26.4	31.5	15.4{1.58}	15.4{1.58}	70*	
0.35 2	2.25	1.1{0.11}	1.1{0.11}	WF5- 5*	
0.38 2.8	4.5	2.2{0.22}	2.2{0.22}	10*	
0.4 3.4	6.7	3.2{0.33}	3.2{0.33}	15*	
0.45 5.4	9	4.4{0.45}	4.4{0.45}	20*	
0.5 8.5	11.2	5.5{0.56}	5.5{0.56}	25*	
0.55 13.2	13.5	6.6{0.67}	6.6{0.67}	30	
0.55 13.2	15.7	7.6{0.78}	7.6{0.78}	35	
0.55 20.4	18	8.8{0.9}	8.8{0.9}	40	
0.6 20.4	20	9.8{1.0}	9.8{1.0}	45	
0.6 20.4	22.5	10.8{1.1}	10.8{1.1}	50	
0.6 20.4	24.7	12.1{1.23}	12.1{1.23}	55	
0.6 20.4	27	12.7{1.3}	12.7{1.3}	60	
0.6 20.4	29.2	14.3{1.5}	14.3{1.5}	65	
0.6 20.4	31.5	15.4{1.6}	15.4{1.6}	70	
0.4 2.3	2.25	1.1{0.11}	1.1{0.11}	WF6- 5*	
0.5 5	4.5	2.2{0.22}	2.2{0.22}	10	
0.55 8	6.7	3.2{0.33}	3.2{0.33}	15	
0.55 8	9	4.4{0.45}	4.4{0.45}	20	
0.6 12	11.2	5.5{0.56}	5.5{0.56}	25	
0.65 16	13.5	6.6{0.67}	6.6{0.67}	30	
0.65 17	15.7	7.6{0.78}	7.6{0.78}	35	
0.65 17	18	8.8{0.9}	8.8{0.9}	40	
0.65 17	20	9.8{1.0}	9.8{1.0}	45	
0.7 25.2	22.5	10.8{1.1}	10.8{1.1}	50	
0.7 25.2	24.7	12.1{1.23}	12.1{1.23}	55	
0.7 25.2	27	12.7{1.3}	12.7{1.3}	60	
0.7 25.2	29.2	14.3{1.46}	14.3{1.46}	65	
0.7 25.2	31.5	14.7{1.5}	14.7{1.5}	70	
0.7 25.2	36	17.7{1.8}	17.7{1.8}	80	
0.6 5	4.5	2.2{0.22}	2.2{0.22}	WF8-10	
0.65 7.5	6.7	3.2{0.33}	3.2{0.33}	15	
0.7 10.8	9	4.4{0.45}	4.4{0.45}	20	
0.7 10.8	11.2	5.5{0.56}	5.5{0.56}	25	
0.75 14.5	13.5	6.6{0.67}	6.6{0.67}	30	
0.75 14.5	15.7	7.6{0.78}	7.6{0.78}	35	
0.8 20	18	8.8{0.9}	8.8{0.9}	40	
0.8 20	20	9.8{1.0}	9.8{1.0}	45	
0.8 20	22.5	10.8{1.1}	10.8{1.1}	50	
0.8 20	24.7	12.1{1.23}	12.1{1.23}	55	
0.85 27.6	27	12.7{1.3}	12.7{1.3}	60	
0.85 27.6	29.2	14.3{1.46}	14.3{1.46}	65	
0.85 27.6	31.5	14.7{1.5}	14.7{1.5}	70	
0.85 28.1	36	17.7{1.8}	17.7{1.8}	80	

• Load calculation method = Spring constant x Deflection
(Int'l Unit) N=N/mmxFmm
kgf=kgf/mmxFmm
(kgf=Nx0.101972)

⚠ Both ends of * marked WF Type springs are not ground.
⚠ The values of solid length are for reference only. There may be some variations depending on the lot.
⚠ Usage Count: 1 Million Times
⚠ Product Outline **P.327**
⚠ How to use coil springs, and precautions **P.328**

d	Solid Length	F max.	Load N{kgf} max.	Part Number	Unit Price
Type D-L				Type D-L	10 ~ 19 pcs.
0.9 6.3	6.7	3.2{0.33}	3.2{0.33}	WF16- 15	
1.0 8.7	9	4.4{0.45}	4.4{0.45}	20	
1.0 8.7	11.2	5.5{0.56}	5.5{0.56}	25	
1.1 12.8	13.5	6.6{0.67}	6.6{0.67}	30	
1.1 12.8	15.7	7.6{0.78}	7.6{0.78}	35	
1.2 18.6	18	8.8{0.9}	8.8{0.9}	40	
1.2 18.6	20	9.8{1.0}	9.8{1.0}	45	
1.2 18.6	22.5	10.8{1.1}	10.8{1.1}	50	
1.2 18.6	24.7	12.1{1.23}	12.1{1.23}	55	
1.3 26.8	27	12.7{1.3}	12.7{1.3}	60	
1.3 26.8	29.2	14.3{1.46}	14.3{1.46}	65	
1.3 26.8	31.5	14.7{1.5}	14.7{1.5}	70	
1.4 36	36	17.7{1.8}	17.7{1.8}	80	
1.4 36.4	40.5	19.9{2.0}	19.9{2.0}	90	
1.2 9	9	8.8{0.9}	8.8{0.9}	WF18- 20	
1.3 12.4	11.2	10.8{1.1}	10.8{1.1}	25	
1.3 12.4	13.5	12.7{1.3}	12.7{1.3}	30	
1.4 16.1	15.7	14.7{1.5}	14.7{1.5}	35	
1.5 21	18	17.7{1.8}	17.7{1.8}	40	
1.5 21	20	19.9{2.03}	19.9{2.03}	45	
1.5 21	22.5	22.1{2.25}	22.1{2.25}	50	
1.6 28.8	24.7	24.3{2.48}	24.3{2.48}	55	
1.6 28.8	27	26.5{2.7}	26.5{2.7}	60	
1.6 28.8	29.2	28.7{2.93}	28.7{2.93}	65	
1.7 37.4	31.5	30.9{3.15}	30.9{3.15}	70	
1.7 37.4	36	35.3{3.6}	35.3{3.6}	80	
1.2 7.2	9	8.8{0.9}	8.8{0.9}	WF20- 20	
1.3 9.8	11.2	10.8{1.1}	10.8{1.1}	25	
1.4 12.6	13.5	12.7{1.3}	12.7{1.3}	30	
1.4 12.6	15.7	14.7{1.5}	14.7{1.5}	35	
1.5 16.5	18	17.7{1.8}	17.7{1.8}	40	
1.5 16.5	20	19.9{2.03}	19.9{2.03}	45	
1.6 21.6	22.5	22.1{2.25}	22.1{2.25}	50	
1.6 21.6	24.7	24.3{2.48}	24.3{2.48}	55	
1.6 21.6	27	26.5{2.7}	26.5{2.7}	60	
1.7 28.1	29.2	28.7{2.93}	28.7{2.93}	65	
1.7 28.1	31.5	30.9{3.15}	30.9{3.15}	70	
1.7 28.1	36	35.3{3.6}	35.3{3.6}	80	
1.3 7.8	9	8.8{0.9}	8.8{0.9}	WF22- 20	
1.4 10.5	11.2	11.0{1.12}	11.0{1.12}	25	
1.4 10.5	13.5	13.2{1.35}	13.2{1.35}	30	
1.5 13.5	15.7	15.4{1.57}	15.4{1.57}	35	
1.5 13.5	18	17.7{1.8}	17.7{1.8}	40	
1.7 22.1	20.2	19.8{2.02}	19.8{2.02}	45	
1.7 22.1	22.5	22.1{2.25}	22.1{2.25}	50	
1.7 22.1	24.7	24.2{2.47}	24.2{2.47}	55	
1.8 28.8	27	26.5{2.7}	26.5{2.7}	60	
1.8 28.8	29.2	28.6{2.92}	28.6{2.92}	65	
1.8 28.8	31.5	30.9{3.15}	30.9{3.15}	70	
1.8 28.8	36	35.3{3.6}	35.3{3.6}	80	
1.7 14.1	13.5	13.2{1.35}	13.2{1.35}	WF27- 30	
1.7 14.1	15.7	15.4{1.57}	15.4{1.57}	35	
1.7 14.1	18	17.7{1.8}	17.7{1.8}	40	
1.9 21.4	20.2	19.8{2.02}	19.8{2.02}	45	
1.9 21.4	22.5	22.1{2.25}	22.1{2.25}	50	
2.0 26	24.7	24.2{2.47}	24.2{2.47}	55	
2.0 26	27	26.5{2.7}	26.5{2.7}	60	
2.0 26	29.2	28.6{2.92}	28.6{2.92}	65	
2.0 26	31.5	30.9{3.15}	30.9{3.15}	70	
2.0 26	36	35.3{3.6}	35.3{3.6}	80	

WL: Fmax. (Allowable Deflection) =Lx40%

d	Solid Length	F max.	Load N(kgff) max.	Part Number	Unit Price
				Type D-L	10 ~ 19 pcs
0.2	1.7	2	0.98{0.1}	WL2- 5*	10'
0.26	5.2	4	2.0{0.2}		
0.26	5.2	6	2.9{0.3}		
0.29	9	8	3.9{0.4}		
0.29	9	10	4.9{0.5}		
0.3	10.8	12	5.9{0.6}	WL3- 5*	10'
0.3	2.1	2	2.0{0.2}		
0.35	3.9	4	3.9{0.4}		
0.4	6.5	6	5.9{0.6}		
0.4	6.5	8	7.8{0.8}		
0.45	13	10	9.8{1.0}	WL4- 5*	10'
0.45	13	12	11.8{1.2}		
0.45	13	14	13.7{1.4}		
0.5	21	16	15.7{1.6}		
0.35	2.1	2	2.0{0.2}		
0.45	5	4	3.9{0.4}	WL5- 5*	10'
0.45	5	6	5.9{0.6}		
0.5	9	8	7.8{0.8}		
0.5	9	10	9.8{1.0}		
0.55	13.9	12	11.8{1.2}		
0.55	13.9	14	13.7{1.4}	WL6- 5*	10'
0.6	21.6	16	15.7{1.6}		
0.6	21.6	18	17.7{1.8}		
0.6	21.6	20	19.6{2.0}		
0.6	21.6	22	21.6{2.2}		
0.65	33	24	23.5{2.4}	WL6- 5*	10'
0.4	2.3	2	2.0{0.2}		
0.45	3.4	4	3.9{0.4}		
0.5	5	6	5.9{0.6}		
0.55	7.7	8	7.8{0.8}		
0.6	10.8	10	9.8{1.0}	WL6- 5*	10'
0.6	10.8	12	11.8{1.2}		
0.65	15.6	14	13.7{1.4}		
0.65	15.6	16	15.7{1.6}		
0.7	20	18	17.7{1.8}		
0.7	20	20	19.6{2.0}	WL6- 5*	10'
0.7	23.1	22	21.6{2.2}		
0.75	33	24	23.5{2.4}		
0.75	32.3	26	25.5{2.6}		
0.75	32.3	28	27.5{2.8}		
0.45	2.5	2	2.0{0.2}	WL6- 5*	10'
0.55	4.7	4	3.9{0.4}		
0.55	4.7	6	5.9{0.6}		
0.65	9	8	7.8{0.8}		
0.65	9	10	9.8{1.0}		
0.7	13.7	12	11.8{1.2}	WL6- 5*	10'
0.7	13.7	14	13.7{1.4}		
0.7	13.7	16	15.7{1.6}		
0.75	18.9	18	17.7{1.8}		
0.75	18.9	20	19.6{2.0}		
0.75	18.9	22	21.6{2.2}	WL6- 5*	10'
0.8	26.4	24	23.5{2.4}		
0.8	26.4	26	25.5{2.6}		
0.85	30.6	28	27.5{2.8}		
0.85	34.9	32	31.4{3.2}		

Round Coil Springs

WT, WM: O.D. Referenced

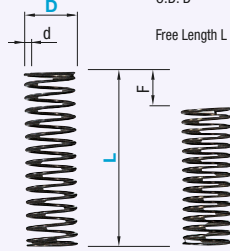


Ordering
Example

Part Number

WT13-60

WT
WM



Spring Constant $\pm 10\%$
O.D. D $\begin{matrix} \text{\textcircled{0}}10 \text{ or Less } -0.5\text{mm} \\ \text{\textcircled{0}}12 \text{ or More } -0.8\text{mm} \end{matrix}$
Free Length L 50 or Less $\pm 1.5\text{mm}$
55 or More $\pm 2\text{mm}$

RoHS

Material JIS-SWP-A

Spring Constant

$\text{\textcircled{D}}12$ and 14 for WY Type and $\text{\textcircled{D}}12, 14$ and 20 for WT Type are not available.

Type	WY	WR	WF	WT	WM	WH	WB
$\text{\textcircled{D}}$				0.5{0.05}			
2				1.5	2.0	2.9{0.3}	3.9{0.4}
3				{0.15}	{0.2}		4.9{0.5}
4	N/mm					N/mm	N/mm
5	0.1					5.9	9.8
6	{kgf/mm}					{kgf/mm}	{kgf/mm}
8	{0.01}	N/mm	N/mm	N/mm	N/mm	{0.6}	{1.0}
10		0.3	0.5	1.0	2.9	9.8	19.6
12		{kgf/mm}	{kgf/mm}	{kgf/mm}	{kgf/mm}	{kgf/mm}	{kgf/mm}
13	N/mm					14.7	29.4
14	0.2					{1.9}	{3.0}
16	{kgf/mm}						
18	{0.02}						
20		N/mm	N/mm	N/mm	N/mm	N/mm	N/mm
22		0.5	1.0	3.9	4.9	14.7	29.4
27		{kgf/mm}	{kgf/mm}	{kgf/mm}	{kgf/mm}	{kgf/mm}	{kgf/mm}
		{0.05}	{0.1}	{0.3}	{0.5}	{1.5}	{3.0}
Fmax.	F=Lx75%	F=Lx60%	F=Lx45%	F=Lx40%	F=Lx40%	F=Lx35%	F=Lx30%
							F=Lx25%

WT: Fmax. (Allowable Deflection) =Lx40% (Lx35%)

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	Unit Price 10 ~ 19 pcs.
0.3	1.73	2	2.9{0.3}	WT3- 5*	
0.4	5	4	5.9{0.6}	10*	
0.45	8.78	6	8.8{0.9}	15*	
0.45	8.78	8	11.8{1.2}	20*	
0.5	14.5	10	14.7{1.5}	25*	
0.4	2.7	2	2.9{0.3}	WT4- 5*	
0.4	2.7	4	5.9{0.6}	10*	
0.5	6.5	6	8.8{0.9}	15*	
0.55	9.63	8	11.8{1.2}	20	
0.55	9.63	10	14.7{1.5}	25	
0.6	15	12	17.7{1.8}	30	
0.6	15	14	20.6{2.1}	35	
0.65	22.1	16	23.5{2.4}	40	
0.45	2.36	2	3.9{0.4}	WT5- 5*	
0.5	3.25	4	7.8{0.8}	10*	
0.6	6.3	6	11.8{1.2}	15	
0.6	6.3	8	15.7{1.6}	20	
0.7	12.6	10	19.6{2.0}	25	
0.7	12.6	12	23.5{2.4}	30	
0.75	17.3	14	27.5{2.8}	35	
0.75	17.3	14	27.5{2.8}	(40)	
0.8	24	15.8	30.9{3.2}	(45)	
0.8	24	17.5	34.3{3.5}	(50)	
0.85	32.3	19.3	37.8{3.9}	(55)	
0.85	32.3	21	41.2{4.2}	(60)	
0.85	34	22.7	44.5{4.5}	(65)	
0.9	44.6	24.5	48.1{4.9}	(70)	
0.5	2.38	2	3.9{0.4}	WT6- 5*	
0.6	4.35	4	7.8{0.8}	10	
0.6	4.35	6	11.8{1.2}	15	
0.7	7.7	8	15.7{1.6}	20	
0.7	7.7	10	19.6{2.0}	25	
0.8	14	12	23.5{2.4}	30	
0.8	14	14	27.5{2.8}	35	
0.85	18.7	16	31.4{3.2}	40	
0.85	18.7	18	35.3{3.6}	45	
0.9	24.8	20	39.2{4.0}	50	
0.9	24.8	19	37.8{3.9}	(55)	
0.9	24.8	21	41.2{4.2}	(60)	
0.9	26.1	22.7	44.5{4.5}	(65)	
1	43	24.5	48.1{4.9}	(70)	
1	43	28	54.9{5.6}	(80)	

• Load calculation method = Spring constant x Deflection
(Int'l Unit) N=N/mmxFmm
kgf=kgf/mmxFmm
(kgf=Nx0.101972)

$\text{\textcircled{D}}$ Allowable Deflection of (L) Size

WT5-40Fmax.=Lx35%

WT5-45Fmax.=Lx35%

WT5-50Fmax.=Lx35%

WT5-55Fmax.=Lx35%

WT5-60Fmax.=Lx35%

WT5-65Fmax.=Lx35%

WT5-70Fmax.=Lx35%

WT6-55Fmax.=Lx35%

WT6-60Fmax.=Lx35%

WT6-65Fmax.=Lx35%

WT6-70Fmax.=Lx35%

WT6-80Fmax.=Lx35%

$\text{\textcircled{D}}$ The values of solid length are for reference only.

There may be some variations depending on the lot.

$\text{\textcircled{D}}$ Usage Count: 1 Million Times

$\text{\textcircled{D}}$ Product Outline $\text{\textcircled{P}}$ P327

$\text{\textcircled{D}}$ How to use coil springs, and precautions $\text{\textcircled{P}}$ P328

WM: Fmax. (Allowable Deflection) =Lx35%

d	Solid Length	F max.	Load N{kgf} max.	Part Number Type D-L	Unit Price 10 ~ 19 pcs.
0.35	2.5	1.8	3.4{0.4}	WM 3- 5*	
0.38	3.3	3.5	6.9{0.7}	10*	
0.45	7	5.3	10.3{1.1}	15*	
0.5	11.5	7	13.7{1.4}	20*	
0.5	11.5	7.5	14.7{1.5}	(25)	
0.55	20.4	9	17.7{1.8}	(30)	
0.4	2.3	1.7	3.9{0.4}	WM 4- 5*	
0.45	3.4	3.5	6.9{0.7}	10*	
0.5	5.1	5.2	10.8{1.1}	15*	
0.55	7.7	7	13.7{1.4}	20	
0.6	11.7	8.7	17.7{1.8}	25	
0.6	11.7	10.5	20.6{2.1}	30	
0.65	17.6	12.2	24.0{2.5}	35	
0.65	17.6	12	23.5{2.4}	(40)	
0.5	2.8	1.7	4.9{0.5}	WM 5- 5*	
0.6	4.2	3.5	9.8{1.0}	10	
0.65	6.5	5.2	14.7{1.5}	15	
0.65	6.5	7	20.6{2.1}	20	
0.7	9.1	8.7	25.5{2.6}	25	
0.75	10.2	10.5	30.4{3.1}	30	
0.8	17.4	12.2	35.3{3.6}	35	
0.85	23.8	14	41.2{4.2}	40	
0.85	23.8	15.8	46.1{4.7}	45	
0.9	23.8	15	43.5{4.5}	(50)	
0.9	30	16.5	49.0{5.0}	(55)	
0.9	30	18	53.0{5.4}	(60)	
0.9	30	17.6	52.0{5.3}	(65)	
0.9	30	19.6	58.8{6.0}	(70)	
0.55	2.8	1.7	4.9{0.5}	WM 6- 5*	
0.65	4.7	3.5	9.8{1.0}	10	
0.75	8	5.2	14.7{1.5}	15	
0.75	8	7	20.6{2.1}	20	
0.85	13.6	8.7	25.5{2.6}	25	
0.85	13.6	10.5	30.4{3.1}	30	
0.9	18	12.2	35.3{3.6}	35	
0.9	18	14	41.2{4.2}	40	
0.9	18	15.8	46.1{4.7}	45	
0.85	18	17.5	51.0{5.2}	50	
1.0	31	19.2	55.9{5.7}	55	
1.0	31	18	53.0{5.4}	(60)	
1.0	31	18.8	54.9{5.6}	(65)	
1.1	47.3	20	58.8{6.0}	(70)	
1.1	48.4	22.4	65.9{6.7}	(80)	
0.75	4.2	3.5	9.8{1.0}	WM 8- 10	
0.9	8.5	5.2	14.7{1.5}	15	
0.9	8.5	7	20.6{2.1}	20	
0.9	8.5	8.7	25.5{2.6}	25	
0.9	8.5	10.5	30.4{3.1}	30	
1.0	13	12.2	35.3{3.6}	35	
1.0	13	14	41.2{4.2}	40	
1.1	19.8	15.8	46.1{4.7}	45	
1.1	19.8	17.5	51.0{5.2}	50	
1.2	31.2	19.2	55.9{5.7}	55	
1.2	31.2	21	61.8{6.3}	60	
1.2	31.2	22.7	64.7{6.6}	65	
1.2	31.2	24.5	71.6{7.3}	70	
1.3	44.2	28	82.4{8.4}	80	

• Load calculation method = Spring constant x Deflection
(Int'l Unit) N=N/mmxFmm
kgf=kgf/mmxFmm
(kgf=Nx0.101972)

$\text{\textcircled{D}}$ The values of solid length are for reference only.

There may be some variations depending on the lot.

$\text{\textcircled{D}}$ Usage Count: 1 Million Times

$\text{\textcircled{D}}$ Product Outline $\text{\textcircled{P}}$ P327

$\text{\textcircled{D}}$ How to use coil springs, and precautions $\text{\textcircled{P}}$ P328

$\text{\textcircled{D}}$ Allowable Deflection of (L) Size

WM3-25Fmax.=Lx30%

WM3-30Fmax.=Lx30%

WM4-40Fmax.=Lx30%

WM5-50Fmax.=Lx30%

WM5-55Fmax.=Lx30%

WM5-60Fmax.=Lx30%

WM5-65Fmax.=Lx27%

WM5-70Fmax.=Lx28%

WM6-60Fmax.=Lx30%

WM6-65Fmax.=Lx29%

WM6-70Fmax.=Lx28%

WM6-80Fmax.=Lx28%

$\text{\textcircled{D}}$ Both ends of * marked WM Type springs are not ground.

d	Solid Length	F max.	Load N(kgf) max.	Part Number	Unit Price
1.3	7.8	5.2	14.7(1.5)	WM 16- 15	10 ~ 19 pcs.
1.4	9.8	7	20.6(2.1)		
1.5	12.5	8.7	25.5(2.6)		
1.5	12.5	10.5	30.4(3.1)		
1.6	15	12.2	35.3(3.6)		
1.6	15	14	41.2(4.2)		
1.7	20.4	15.8	46.1(4.7)		
1.7	20.4	17.5	51.0(5.2)		
1.8	27	19.2	55.9(5.7)		
1.8	27	21	61.8(6.3)		
1.8	27	22.7	64.7(6.6)		
1.8	27	24.5	71.6(7.3)		
1.8	27	28	82.4(8.4)		
1.9	34.2	31.5	92.7(9.5)		
1.7	11.9	7	34.3(3.5)	WM 18- 20	
1.8	14.4	8.7	42.2(4.3)		
1.8	14.4	10.5	51.0(5.2)		
1.8	14.4	12.2	59.8(6.1)		
1.8	14.4	14	68.6(7.0)		
2.0	22	15.8	77.5(7.9)		
2.0	22	17.5	85.3(8.7)		
2.0	22	19.2	94.1(9.6)		
2.0	22	21	103.0(10.5)		
2.2	34.1	22.7	110.8(11.3)		
2.2	34.1	24.5	119.6(12.2)		
2.2	34.1	28	137.3(14.0)		
2.3	41.4	31.5	154.0(15.7)		
2.3	41.4	35	171.6(17.5)		
1.8	11.7	7	34.3(3.5)	WM 20- 20	
1.8	11.7	8.7	42.2(4.3)		
1.9	14.3	10.5	51.0(5.2)		
1.9	14.3	12.2	59.8(6.1)		
1.9	14.3	14	68.6(7.0)		
2.0	17	15.8	77.5(7.9)		
2.0	17	17.5	85.3(8.7)		
2.2	24.8	19.2	94.1(9.6)		
2.2	24.8	21	103.0(10.5)		
2.2	24.8	22.7	110.8(11.3)		
2.2	24.8	24.5	119.6(12.2)		
2.4	36	28	137.3(14.0)		
2.4	36	31.5	154.0(15.7)		
2.4	36	35	171.6(17.5)		
1.9	12	7	34.3(3.5)	WM 22- 20	
2.0	14	8.7	42.2(4.3)		
2.0	14	10.5	51.0(5.2)		
2.0	14	12.2	59.8(6.1)		
2.0	14	14	68.6(7.0)		
2.3	23	15.8	77.5(7.9)		
2.3	23	17.5	85.3(8.7)		
2.3	23	19.2	94.1(9.6)		
2.3	23	21	103.0(10.5)		
2.4	30	22.7	110.8(11.3)		
2.4	30	24.5	119.6(12.2)		
2.4	30	28	137.3(14.0)		
2.6	40	31.5	154.0(15.7)		
2.6	40	35	171.6(17.5)		
2.3	14	10.5	51.0(5.2)	WM 27- 30	
2.4	17	12.2	59.8(6.1)		
2.4	17	14	68.6(7.0)		
2.4	18	15.8	77.5(7.9)		
2.6	23	17.5	85.3(8.7)		
2.6	23	19.2	94.1(9.6)		
2.6	23	21	103.0(10.5)		
2.8	31	22.7	110.8(11.3)		
2.8	31	24.5	119.6(12.2)		
2.8	31	28	137.3(14.0)		
3.0	43.5	31.5	154.0(15.7)		
3.0	43.5	35	171.6(17.5)		

Round Coil Springs

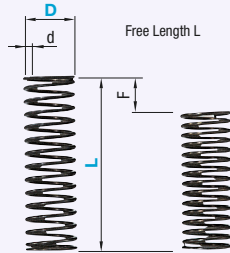
WH, WB: O.D. Datum Type



Ordering
Example

Part Number
WH13-60

WH
WB



Spring Constant $\pm 10\%$
0 . D . D
Free Length L
010 or Less 0.5mm
012 or More 0.8mm
50 or Less $\pm 1.5\text{mm}$
55 or More $\pm 2\text{mm}$

RoHS

Material JIS-SWP-A

Spring Constant

D12 and 14 for WY Type and D12,14 and 20 for WT Type are not available.

Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5{0.05}				
3					1.5 {0.15}	2.0 {0.2}	2.9{0.3}	3.9{0.4}
4	N/mm 0.1 {kgf/mm} {0.01}							
5								
6								
8								
10		N/mm 0.3 {kgf/mm} {0.03}	N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 2.0 {kgf/mm} {0.2}	N/mm 2.9 {kgf/mm} {0.3}	N/mm 5.9 {kgf/mm} {0.6}	N/mm 9.8 {kgf/mm} {1.0}
12	N/mm 0.2 {kgf/mm} {0.02}						N/mm 9.8 {kgf/mm} {2.9}	N/mm 19.6 {kgf/mm} {3.9}
13								
14								
16								
18								
20		N/mm 0.5 {kgf/mm} {0.05}	N/mm 1.0 {kgf/mm} {0.1}	N/mm 3.9 {kgf/mm} {0.3}	N/mm 4.9 {kgf/mm} {0.4}	N/mm 14.7 {kgf/mm} {0.5}	N/mm 14.7 {kgf/mm} {1.5}	N/mm 29.4{3.0}
22								
27								
Fmax.	F=Lx75%	F=Lx60%	F=Lx45%	F=Lx40%	F=Lx40%	F=Lx35%	F=Lx30%	F=Lx25%

WH:Fmax. (allowable deflection)=Lx30%

d	Solid Length	F max.	Load N(kgf) max.	Part Number TypeD-L	Unit Price 10 ~ 19 pcs.
0.45	2.7	1.5	4.9{0.5}	WH4- 5*	
0.45	2.7	3	8.8{0.9}	10*	
0.55	5.8	4.5	13.7{1.4}	15	
0.6	8.4	6	17.7{1.8}	20	
0.65	12.4	7.5	22.6{2.3}	25	
0.65	12.4	9	26.5{2.7}	30	
0.6	3.3	1.5	8.8{0.9}	WH5- 5*	
0.7	5.5	3	17.7{1.8}	10	
0.75	7.5	4.5	26.5{2.7}	15	
0.75	7.5	6	35.3{3.6}	20	
0.85	13.6	7.5	44.1{4.5}	25	
0.85	13.6	7.5	44.3{4.5}	(30)	
0.9	17.1	8.8	51.6{5.3}	(35)	
0.9	17.1	8.8	51.9{5.3}	(40)	
0.65	3.3	1.5	8.8{0.9}	WH6- 5*	
0.75	5.2	3	17.7{1.8}	10	
0.8	6.4	4.5	26.5{2.7}	15	
0.9	9.9	6	35.3{3.6}	20	
0.9	9.9	7.5	44.1{4.5}	25	
1.0	16	9	53.0{5.4}	30	
1.0	16	10.5	61.8{6.3}	35	
1.1	25	12	70.6{7.2}	40	
1.1	25	11.3	66.7{6.8}	(45)	
1.2	39.6	10	58.8{6.0}	(50)	
1.2	39.6	14.5	85.3{8.7}	(55)	
1.2	39.6	14	82.4{8.4}	(60)	
1.2	39.6	14	82.4{8.4}	(65)	
1.2	39.6	15	88.3{9.0}	(70)	
0.9	5.4	3	17.7{1.8}	WH8- 10	
1.0	8	4.5	26.5{2.7}	15	
1.1	11.5	6	35.3{3.6}	20	
1.1	11.5	7.5	44.1{4.5}	25	
1.2	16.8	9	53.0{5.4}	30	
1.2	16.8	10.5	61.8{6.3}	35	
1.2	16.8	12	70.6{7.2}	40	
1.3	24.7	13.5	79.4{8.1}	45	
1.3	24.7	15	88.3{9.0}	50	
1.4	35	16.5	97.1{9.9}	55	
1.4	35	18	105.9{10.8}	60	
1.4	35	17	100.0{10.2}	(65)	
1.4	35	19	111.8{11.4}	(70)	
1.0	5.4	3	17.7{1.8}	WH10- 10	
1.1	7	4.5	26.5{2.7}	15	
1.2	9.6	6	35.3{3.6}	20	
1.2	9.6	7.5	44.1{4.5}	25	
1.3	13.9	9	53.0{5.4}	30	
1.4	18	10.5	61.8{6.3}	35	
1.4	18	12	70.6{7.2}	40	
1.5	25	13.5	79.4{8.1}	45	
1.5	25	15	88.3{9.0}	50	
1.5	25	16.5	97.1{9.9}	55	
1.5	25	18	105.9{10.8}	60	
1.6	35	19.5	114.7{11.7}	65	
1.6	35	21	123.6{12.6}	70	
1.7	45.9	24	141.0{14.4}	80	

• Load calculation method = Spring constant x Deflection (Int'l Unit) N=N/mmxFmm

kgf=kgf/mmxFmm (kgf=Nx0.101972)

The values of solid length are for reference only. There may be some variations depending on the lot.

Usage Count: 1 Million Times

Product Outline **P.327**

How to use coil springs, and precautions **P.328**

Allowable Deflection of (L) Size

WH5-30Fmax.=Lx25%

WH5-35Fmax.=Lx25%

WH5-40Fmax.=Lx22%

WH6-45Fmax.=Lx25%

WH6-50Fmax.=Lx20%

WH6-55Fmax.=Lx26%

WH6-60Fmax.=Lx23%

WH6-65Fmax.=Lx21%

WH6-70Fmax.=Lx21%

WH6-75Fmax.=Lx26%

WH8 -70Fmax. =Lx27%

WH18-90Fmax. =Lx29%

WH18-100Fmax.=Lx24%

WH22-90Fmax. =Lx21%

WH22-100Fmax.=Lx26%

WB:Fmax. (allowable deflection)=Lx25%

d	Solid Length	F max.	Load N(kgf) max.	Part Number TypeD-L	Unit Price 10 ~ 19 pcs.
0.4	3.2	1.3	4.9{0.5}	WB3- 5*	
0.5	6.5	2.5	9.8{1.0}	10*	
0.55	10.5	3.8	14.7{1.5}	15*	
0.55	12.7	5	19.6{2.0}	20*	
0.6	17.4	6.3	24.5{2.5}	25*	
0.6	21.0	7.5	29.4{3.0}	30*	
0.65	24.0	8.8	34.3{3.5}	35*	
0.65	27.0	10.0	39.2{4.0}	40*	
0.5	3	1.3	5.9{0.6}	WB4- 5*	
0.6	6	2.5	12.3{1.3}	10	
0.65	9.8	3.8	18.1{1.9}	15	
0.7	12.6	5	24.5{2.5}	20	
0.75	16.5	6.3	30.4{3.1}	25	
0.75	20.3	7.5	36.8{3.8}	30	
0.8	24	8.8	43.1{4.4}	35	
0.8	28	10	49.0{5.0}	40	
0.8	29	11.3	55.4{5.7}	45	
0.85	34	12.5	61.3{6.3}	50	
0.65	3.3	1.3	12.7{1.3}	WB5- 5	
0.8	7	2.5	24.5{2.5}	10	
0.8	7	3.8	37.3{3.8}	15	
0.9	13	5	49.0{5.0}	20	
0.9	13	6.3	61.8{6.3}	25	
1.0	21	7.5	73.5{7.5}	30	
1.0	25	8.8	86.3{8.8}	35	
1.0	25	10	98.1{10.0}	40	
1.1	31	11.3	110.8{11.3}	45	
1.1	34	12.5	122.6{12.5}	50	
1.1	39	13.8	135.3{13.8}	55	
1.1	43	15	147.1{15.0}	60	
1.1	46	16.3	159.8{16.3}	65	
1.2	50	17.5	171.6{17.5}	70	
0.7	3.5	1.3	12.7{1.3}	WB6- 5	
0.9	7	2.5	24.5{2.5}	10	
0.9	7.5	3.8	37.3{3.8}	15	
1.0	11.5	5	49.0{5.0}	20	
1.1	17.5	6.3	61.8{6.3}	25	
1.1	19.5	7.5	73.5{7.5}	30	
1.1	20	8.8	86.3{8.8}	35	
1.2	28	10	98.1{10.0}	40	
1.2	30	11.3	110.8{11.3}	45	
1.2	32	12.5	122.6{12.5}	50	
1.2	32	13.8	135.3{13.8}	55	
1.3	43	15	147.1{15.0}	60	
1.3	46	16.3	159.8{16.3}	65	
1.3	50	17.5	171.6{17.5}	70	
1.4	57	20	196.1{20.0}	80	
1.0	6	2.5	24.5{2.5}	WB8- 10	
1.2	10.8	3.8	37.3{3.8}	15	
1.2	11.5	5	49.0{5.0}	20	
1.3	17	6.3	61.8{6.3}	25	
1.3	17	7.5	73.5{7.5}	30	
1.4	24.5	8.8	86.3{8.8}	35	
1.4	25.2	10	98.1{10.0}	40	
1.5	32	11.3	110.8{11.3}	45	
1.5	33	12.5	122.6{12.5}	50	
1.5	36.5	13.8	135.3{13.8}	55	
1.5	36.5	15	147.1{15.0}	60	
1.6	48	16.3	159.8{16.3}	65	
1.6	48	17.5	171.6{17.5}	70	
1.6	55	20	196.1{20.0}	80	

• Load calculation method = Spring constant x Deflection (Int'l Unit) N=N/mmxFmm

kgf=kgf/mmxFmm (kgf=Nx0.101972)

Both ends of * marked WB Type springs are not ground.

The values of solid length are for reference only.

There may be some variations depending on the lot.

Usage Count: 1 Million Times

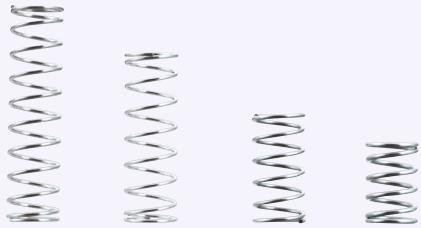
Product Outline **P.327**

How to use coil springs, and precautions **P.328**

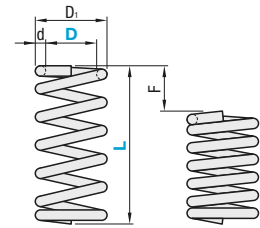
Round Coil Springs

I.D. Referenced

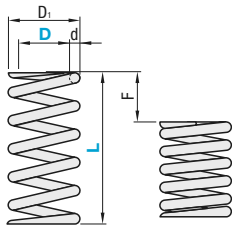
VUR
VUF
VUL
VUM



RoHS



Closed Ends (Both Ends Not Ground*)



Closed Ends (Both Ends Ground)

I.D. $\varnothing$ 8 or Less ± 0.6 mm
 $\varnothing 10$ or More ± 0.8 mm
Free Length L 50 or Less ± 1 mm
60 or More ± 2 mm

Material EN 1.4301 (WPB) Equiv. Spring Constant $\pm 10\%$

■VUR:Fmax. (Allowable Deflection) = Lx60% Spring Constant 0.29N/mm [0.03kgf/mm]

Part Number	O.D.	Wire Dia.	F	N{kgf}	Reference	Unit Price	Volume	Discount	Rate
Type D - L	D1	d	max.	max.	Pitch Solid Length Total Coils	1-3 pcs	4-9	10-19	20-100
VUR 5 - 15	5.9	0.45	9	2.65(0.27)	1.7	5.0	10		
20	12	0.50	15	3.53(0.36)	2.2	7.5	14		
25	18	0.55	21	5.29(0.54)	2.3	9.6	16.5		
30	24	0.60	27	7.06(0.72)	2.6	13.8	22		
35	30	0.65	33	8.82(0.90)	2.4	18.2	25		
40	36	0.70	39	10.58(1.08)	2.5	22.8	31		
45	42	0.75	45	12.35(1.26)	2.9	26.0	25		
50	48	0.80	51	14.12(1.44)	3.3	26.0	25		
VUR 6 - 15	7.0	0.50	9	2.65(0.27)	1.9	5.0	9		
20	12	0.55	15	3.53(0.36)	2.0	6.6	11		
25	18	0.60	21	5.29(0.54)	2.3	9.0	14		
30	24	0.65	27	7.06(0.72)	2.6	13.3	19.5		
35	30	0.70	33	8.82(0.90)	2.3	18.2	25		
40	36	0.75	39	10.58(1.08)	2.5	22.8	31		
45	42	0.80	45	12.35(1.26)	2.9	26.0	25		
50	48	0.85	51	14.12(1.44)	3.3	26.0	25		
VUR 8 - 20	9.3	0.65	12	3.53(0.36)	2.4	6.8	9.5		
25	15	0.70	18	5.29(0.54)	2.7	9.1	12		
30	21	0.75	24	7.06(0.72)	3.0	11.5	15		
35	27	0.80	30	8.82(0.90)	3.2	14.1	18		
40	33	0.85	36	10.58(1.08)	3.4	16.2	17		
45	39	0.90	42	12.35(1.26)	3.8	18.0	14		
50	45	0.95	48	14.12(1.44)	4.1	20.5	11		
55	51	1.00	54	15.89(1.62)	4.3	22.5	9		
60	57	1.05	60	17.66(1.80)	4.7	24.5	8		
65	63	1.10	66	19.43(1.98)	5.0	26.5	7		
70	69	1.15	72	21.20(2.16)	5.3	28.5	6		
75	75	1.20	78	22.97(2.34)	5.6	30.5	5		
80	81	1.25	84	24.74(2.52)	5.9	32.5	4		
85	87	1.30	90	26.51(2.70)	6.2	34.5	3		
90	93	1.35	96	28.28(2.88)	6.5	36.5	2		
95	99	1.40	102	30.05(3.06)	6.8	38.5	1		
100	105	1.45	108	31.82(3.24)	7.1	40.5	0		
VUR 10 - 20	11.4	0.70	12	3.53(0.36)	3.3	5.6	7		
25	15.5	0.75	18	5.29(0.54)	3.6	7.5	9		
30	21.6	0.80	24	7.06(0.72)	3.9	10.4	12		
35	27.7	0.85	30	8.82(0.90)	4.2	12.3	14		
40	33.8	0.90	36	10.58(1.08)	4.5	14.2	16		
45	39.9	0.95	42	12.35(1.26)	4.8	16.1	18		
50	46.0	1.00	48	14.12(1.44)	5.1	18.0	20		
55	52.1	1.05	54	15.89(1.62)	5.4	19.9	22		
60	58.2	1.10	60	17.66(1.80)	5.7	21.8	24		
65	64.3	1.15	66	19.43(1.98)	6.0	23.7	26		
70	70.4	1.20	72	21.20(2.16)	6.3	25.6	28		
75	76.5	1.25	78	22.97(2.34)	6.6	27.5	30		
80	82.6	1.30	84	24.74(2.52)	6.9	29.4	32		
85	88.7	1.35	90	26.51(2.70)	7.2	31.3	34		
90	94.8	1.40	96	28.28(2.88)	7.5	33.2	36		
95	100.9	1.45	102	30.05(3.06)	7.8	35.1	38		
100	107.0	1.50	108	31.82(3.24)	8.1	37.0	40		
VUR 12 - 25	13.6	0.80	15	4.41(0.45)	3.6	7.2	8		
30	21.6	0.90	24	7.06(0.72)	3.8	11.3	11.5		
35	27.7	1.00	30	8.82(0.90)	4.0	15.4	14.5		
40	33.8	1.10	36	10.58(1.08)	4.2	19.5	18		
45	39.9	1.20	42	12.35(1.26)	4.4	23.6	22		
50	46.0	1.30	48	14.12(1.44)	4.6	27.7	26		
55	52.1	1.40	54	15.89(1.62)	4.8	31.8	30		
60	58.2	1.50	60	17.66(1.80)	5.0	35.9	34		
65	64.3	1.60	66	19.43(1.98)	5.2	40.0	38		
70	70.4	1.70	72	21.20(2.16)	5.4	44.1	42		
75	76.5	1.80	78	22.97(2.34)	5.6	48.2	46		
80	82.6	1.90	84	24.74(2.52)	5.8	52.3	50		
85	88.7	2.00	90	26.51(2.70)	6.0	56.4	54		
90	94.8	2.10	96	28.28(2.88)	6.2	60.5	58		
95	100.9	2.20	102	30.05(3.06)	6.4	64.6	62		
100	107.0	2.30	108	31.82(3.24)	6.6	68.7	66		
VUR 16 - 35	18.0	1.00	21	6.17(0.63)	4.7	9.5	8.5		
40	24.0	1.10	27	7.94(0.81)	4.5	13.2	11		
45	30.0	1.20	33	9.70(0.99)	5.0	17.0	14		
50	36.0	1.30	39	11.47(1.17)	5.5	20.8	17		
55	42.0	1.40	45	13.24(1.32)	6.0	24.6	20		
60	48.0	1.50	51	15.01(1.50)	6.5	28.4	23		
65	54.0	1.60	57	16.78(1.66)	7.0	32.2	26		
70	60.0	1.70	63	18.55(1.83)	7.5	36.0	29		
75	66.0	1.80	69	20.32(2.01)	8.0	39.8	32		
80	72.0	1.90	75	22.09(2.18)	8.5	43.6	35		
85	78.0	2.00	81	23.86(2.36)	9.0	47.4	38		
90	84.0	2.10	87	25.63(2.55)	9.5	51.2	41		
95	90.0	2.20	93	27.40(2.72)	10.0	55.0	44		
100	96.0	2.30	99	29.17(2.90)	10.5	58.8	47		

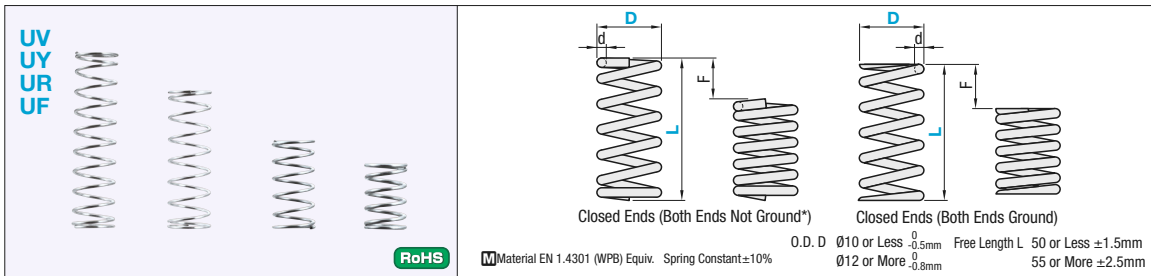
⚠ The values of solid length are for reference only. There may be some variations depending on the lot.
⚠ Both ends are not ground for all sizes.
⚠ Usage Count: 1 Million Times

■VUF:Fmax. (Allowable Deflection) = Lx45% Spring Constant 0.49N/mm [0.05kgf/mm]

Part Number	O.D.	Wire Dia.	F	N{kgf}	Reference		Unit Price	Volume	Discount	Rate							
Type D - L	D1	d	max.	max.	Pitch	Solid Length	Total Coils	1-3 pcs	4-9	10-19	20-100						
VUF 5 - 15*	6.0	0.50	6.8	3.33(0.34)	2.3	4.3	7.5										
20*			9.0	4.41(0.45)	3.1												
25			11.3	5.49(0.56)	2.1	8.4	13										
30	6.2	0.60	13.5	6.57(0.67)	2.5												
35			15.8	7.64(0.78)	2.9												
40			18.0	8.82(0.90)	1.9												
45	6.4	0.70	20.3	9.90(1.01)	2.1	16.1	22										
50			22.5	10.98(1.12)	2.4												
VUF 6 - 15			6.8	3.33(0.34)	1.9											6.0	9
20			9.0	4.41(0.45)	2.5												
25	7.2	0.60	11.3	5.49(0.56)	3.1												
30			13.5	6.57(0.67)	3.8												
35			15.8	7.64(0.78)	2.7	10.5	14										
40	7.4	0.70	18.0	8.82(0.90)	3.1												
45			20.3	9.90(1.01)	3.5												
50			22.5	10.98(1.12)	2.4												
55	7.6	0.80	24.8	12.05(1.23)	2.6	18.4	22										
60			27.0	13.23(1.35)	2.9												
VUF 8 - 20			9.0	4.41(0.45)	3.1	6.0	7.5										
25	9.4	0.70	11.3	5.49(0.56)	3.8												
30			13.5	6.57(0.67)	4.6												
35			15.8	7.64(0.78)	3.3												
40			18.0	8.82(0.90)	3.8	10.0	11.5										
45	9.6	0.80	20.3	9.90(1.01)	4.3												
50			22.5	10.98(1.12)	4.8												
55			24.8	12.05(1.23)	2.5												
60			27.0	13.23(1.35)	2.7	24.0	23										
65	10.0	1.00	29.3	14.31(1.46)	3.0												
70			31.5	15.39(1.57)	3.2												
80			36.0	17.64(1.80)	3.6												
VUF 10 - 20			9.0	4.41(0.45)	3.3	6.4	7										
25	11.6	0.80	11.3	5.49(0.56)	4.2												
30			13.5	6.57(0.67)	5.0												
35			15.8	7.64(0.78)	3.9												
40			18.0	8.82(0.90)	4.4	9.9	10										
45	11.8	0.90	20.3	9.90(1.01)	5.0												
50			22.5	10.98(1.12)	5.6												
55			24.8	12.05(1.23)	3.1												
60			27.0	13.23(1.35)	3.4	21.5	18.5										
65	12.2	1.10	29.3	14.31(1.46)	3.7												
70			31.5	15.39(1.57)	4.0												
80			36.0	17.64(1.80)	4.6												
VUF 12 - 25			11.3	5.49(0.56)	3.1	10.0	9										
30	14.0	1.00	13.5	6.57(0.67)	3.8												
35			15.8	7.64(0.78)	4.4												
40			18.0	8.82(0.90)	5.0												
45			20.3	9.90(1.01)	5.6	14.9	12.5										
50			22.5	10.98(1.12)	4.3												
55	14.2	1.10	24.8	12.05(1.23)	4.8												
60			27.0	13.23(1.35)	5.2												
65			29.3	14.31(1.46)	5.7	21.6	17										
70			31.5	15.39(1.57)	4.4												
80	14.4	1.20	36.0	17.64(1.80)	5.0												
90			45.0	19.80(2.02)	5.6												
VUF 16 - 35			15.8	7.64(0.78)	4.7	11.4	8.5										
40	18.4	1.20	18.0	8.82(0.90)	5.3												
45			20.3	9.90(1.01)	6.0												
50			22.5	10.98(1.12)	6.7												
55			24.8	12.05(1.23)	5.2	16.3	11.5										
60	18.6	1.30	27.0	13.23(1.35)	5.7												
65			29.3	14.31(1.46)	6.2												
70			31.5	15.39(1.57)	5.4												
80	18.8	1.40	36.0	17.64(1.80)	6.2	21.0	14										
90			40.5	19.80(2.02)	6.9												
100			45.0	22.05(2.25)	7.7												

Round Coil Springs

O.D. Referenced Stainless Steel



UV: Fmax. (Allowable Deflection) =LxFa%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	Unit Price
UV3- 5	0.15	1.1	4	0.18(0.018)	70	
10	0.18	2.5	7	0.35(0.036)		
15	0.18	2.5	11	0.53(0.054)		
20	0.20	3.3	14	0.70(0.071)		
25	0.23	6.2	18	0.88(0.089)		
30	0.23	6.2	21	1.05(0.107)		
UV4- 5	0.18	1.2	4	0.18(0.018)		
10	0.20	1.7	7	0.35(0.036)		
15	0.23	3.0	11	0.53(0.054)		
20	0.23	3.0	14	0.70(0.071)		
25	0.26	4.9	18	0.88(0.089)		
30	0.26	4.9	21	1.05(0.107)		
UV5- 5	0.20	1.2	4	0.18(0.018)	70	
10	0.23	1.8	7	0.35(0.036)		
15	0.26	2.9	11	0.53(0.054)		
20	0.29	4.5	14	0.70(0.071)		
25	0.29	4.5	18	0.88(0.089)		
30	0.29	4.5	21	1.05(0.107)		
UV6- 10	0.26	2.0	7	0.35(0.036)		
15	0.30	3.3	11	0.53(0.054)		
20	0.30	3.3	14	0.70(0.071)		
25	0.35	6.5	18	0.88(0.089)		
30	0.35	6.5	21	1.05(0.107)		
35	0.35	6.5	25	1.23(0.125)		
40	0.35	6.5	28	1.40(0.143)		
UV8- 10	0.30	1.9	7	0.35(0.036)	70	
15	0.35	3.2	11	0.53(0.054)		
20	0.35	3.2	14	0.70(0.071)		
25	0.40	5.6	18	0.88(0.089)		
30	0.40	5.6	21	1.05(0.107)		
35	0.40	5.6	25	1.23(0.125)		
40	0.45	9.3	28	1.40(0.143)		
45	0.45	9.3	32	1.58(0.161)		
50	0.45	9.3	35	1.75(0.179)		
55	0.45	9.3	35	1.75(0.179)		

UY: Fmax. (Allowable Deflection) =LxFa%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	Unit Price
UY2- 5	0.13	1.5	3	0.15(0.015)	60	
10	0.13	1.5	6	0.29(0.03)		
15	0.15	2.7	9	0.44(0.045)		
20	0.15	2.7	12	0.59(0.06)		
25	0.18	6.3	15	0.74(0.075)		
30	0.18	6.3	18	0.88(0.09)		
UY3- 5	0.16	0.92	3.75	0.37(0.0375)	75	
10	0.2	2	7.5	0.74(0.075)		
15	0.23	3.45	11.25	1.10(0.1125)		
20	0.23	3.45	15	1.47(0.15)		
25	0.26	6.24	15	1.47(0.15)		
30	0.26	6.24	18	1.77(0.18)		
UY4- 5	0.2	1.05	3.75	0.37(0.0375)	75	
10	0.23	1.84	7.5	0.74(0.075)		
15	0.26	2.86	11.25	1.10(0.1125)		
20	0.29	4.64	15	1.47(0.15)		
25	0.3	5.4	18.75	1.84(0.1875)		
30	0.3	5.4	22.5	2.26(0.23)		
UY5- 5	0.23	1.15	3.75	0.37(0.0375)	75	
10	0.26	1.82	7.5	0.74(0.075)		
15	0.3	3.15	11.25	1.10(0.1125)		
20	0.3	3.15	15	1.47(0.15)		
25	0.32	4.16	18.75	1.84(0.1875)		
30	0.32	4.16	22.5	2.26(0.23)		
35	0.35	6	26.25	2.55(0.26)		
40	0.35	6	30	2.94(0.3)		
45	0.35	6	30	2.94(0.3)		
50	0.35	6	30	2.94(0.3)		

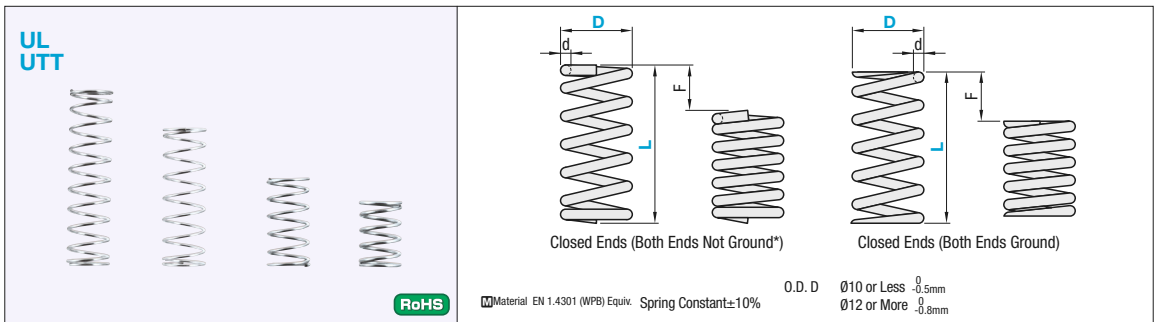
Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	Unit Price
UY6- 5	0.26	1.24	3.5	0.34(0.035)	70	
10	0.3	2.1	7.5	0.74(0.075)		
15	0.32	2.64	11.25	1.10(0.1125)		
20	0.35	3.85	15	1.47(0.15)		
25	0.38	5.32	18.75	1.84(0.1875)		
30	0.4	6.8	22.5	2.21(0.225)		
35	0.4	6.8	26.25	2.55(0.26)		
40	0.4	6.8	30	2.94(0.3)		
UY8- 10	0.35	2.19	7.5	0.74(0.075)	75	
15	0.4	3.4	11.25	1.10(0.1125)		
20	0.4	3.4	15	1.47(0.15)		
25	0.45	5.4	18.75	1.84(0.1875)		
30	0.45	5.4	22.5	2.21(0.225)		
35	0.5	8.3	26.25	2.55(0.26)		
40	0.5	8.3	30	2.94(0.3)		
45	0.5	8.3	33.75	3.33(0.34)		
50	0.55	12.7	35	3.43(0.35)		
UY10- 10	0.5	3.25	6	1.18(0.12)	60	
15	0.5	3.25	11.25	2.21(0.225)		
20	0.55	4.4	15	2.94(0.3)		
25	0.55	4.4	18.75	3.68(0.375)		
30	0.6	6.15	22.5	4.41(0.45)		
35	0.6	6.3	26.25	5.10(0.52)		
40	0.6	6.3	30	5.88(0.6)		
45	0.65	8.45	33.75	6.62(0.675)		
50	0.65	8.45	37.5	7.35(0.75)		
UY12- 15	0.55	3.3	11.25	2.206(0.225)	75	
20	0.55	3.3	15	2.942(0.3)		
25	0.6	4.2	18.75	3.68(0.375)		
30	0.65	5.53	22.5	4.41(0.45)		
35	0.65	5.53	26.25	5.15(0.525)		
40	0.7	7.35	30	5.88(0.6)		
45	0.7	7.35	33.75	6.62(0.675)		
50	0.7	7.35	37.5	7.35(0.75)		
60	0.8	13.6	45	8.83(0.9)		
70	0.8	13.6	52.5	10.30(1.05)		
80	0.8	13.6	60	11.77(1.2)		
UY13- 15	0.6	3.75	10.5	2.06(0.21)	70	
20	0.6	3.75	15	2.94(0.3)		
25	0.65	4.9	18.75	3.68(0.375)		
30	0.65	4.9	22.5	4.41(0.45)		
35	0.7	6.3	26.25	5.15(0.525)		
40	0.75	8.25	30	5.88(0.6)		
45	0.75	8.25	33.75	6.62(0.675)		
50	0.8	11.2	37.5	7.35(0.75)		
60	0.8	11.2	45	8.83(0.9)		
70	0.85	14.45	52.5	10.30(1.05)		
80	0.85	14.45	60	11.77(1.2)		
UY16- 15	0.7	4.2	9	1.77(0.18)	60	
20	0.7	4.2	15	2.94(0.3)		
25	0.7	4.2	18.75	3.68(0.375)		
30	0.75	5.44	22.5	4.41(0.45)		
35	0.8	6.8	26.25	5.15(0.525)		
40	0.8	6.8	30	5.88(0.6)		
45	0.85	8.5	33.75	6.62(0.675)		
50	0.9	10.8	37.5	7.35(0.75)		
60	0.9	10.8	45	8.83(0.9)		
70	1	17	52.5	10.30(1.05)		
80	1	17	60	11.77(1.2)		
UY20- 20	0.9	5.4	12	3.53(0.36)	60	
25	0.9	5.4	18.75	5.49(0.56)		
30	0.9	5.4	22.5	6.62(0.675)		
35	1	7.5	26.25	7.65(0.78)		
40	1	7.5	30	8.83(0.9)		
45	1	7.5	33.75	9.90(1.01)		
50	1.1	11	37.5	11.03(1.125)		
60	1.1	11	45	13.24(1.35)		
70	1.2	15.6	52.5	15.45(1.58)		
80	1.2	15.6	60	17.65(1.8)		

UR: Fmax. (Allowable Deflection) =LxFa%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	Unit Price
UR2- 5	0.18	2.0	2.5	0.49(0.05)	50	
10	0.18	2.0	5	0.98(0.1)		
15	0.23	6.0	7.5	1.5(0.15)		
20	0.23	6.0	10	2.0(0.2)		
25	0.26	11.2	12.5	2.5(0.25)		
30	0.26	11.2	15	2.9(0.3)		
UR3- 5	0.23	1.6	3	0.9(0.09)	60	
10	0.25	2.1	6	1.8(0.18)		
15	0.3	4.5	9	2.6(0.27)		
20	0.3	4.5	12	3.5(0.36)		
25	0.32	6.4	15	4.4(0.45)		
30	0.32	6.4	18	5.3(0.54)		
35	0.35	9.8	21	6.2(0.63)		
40	0.35	9.8	24	7.1(0.72)		
UR4- 5	0.26	1.4	3	0.9(0.09)	60	
10	0.29	2	6	1.8(0.18)		
15	0.32	3	9	2.6(0.27)		
20	0.38	6.1	12	3.5(0.36)		
25	0.38	6.1	15	4.4(0.45)		
30	0.40	8	18	5.3(0.54)		
35	0.40	8	21	6.2(0.63)		
40	0.45	14.4	24	7.1(0.72)		
45	0.45	14.4	27	7.9(0.81)		
50	0.45	14.4	30	8.8(0.9)		
60	0.5	23	36	10.6(1.08)		
UR5- 5	0.3	1.65	3	0.9(0.09)	60	
10	0.35	2.71	6	1.8(0.18)		
15	0.38	3.61	9	2.6(0.27)		
20	0.38	3.61	12	3.5(0.36)		
25	0.45	7.43	15	4.4(0.45)		
30	0.45	7.43	18	5.3(0.54)		
35	0.5	12.25	21	6.2(0.63)		
40	0.5	12.25	24	7.1(0.72)		
45	0.5	12.25	27	7.9(0.81)		
50	0.55	19.53	30	8.8(0.9)		
60	0.55	19.53	36	10.6(1.08)		
UR6- 5	0.32	1.5	3	0.9(0.09)	60	
10	0.4	3	6	1.8(0.18)		
15	0.4	3	9	2.6(0.27)		
20	0.5	7	12	3.5(0.36)		

Round Coil Springs

O.D. Referenced Stainless Steel



UL: Fmax. (Allowable Deflection) =Lx40%

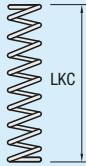
Part Number Type D-L	d	Solid Length	F max.	N{kkgf} max.	Unit Price
UL 2- 5*	0.2	1.65	2	0.98 {0.1}	
10*	0.26	5.07	4	1.96 {0.2}	
15*	0.26	5.07	6	2.94 {0.3}	
20*	0.3	9.9	8	3.92 {0.4}	
25*	0.32	14.1	10	4.90 {0.5}	
30*	0.32	14.1	12	5.88 {0.6}	
UL 3- 5*	0.30	2	2	2.0 {0.2}	
10*	0.35	3.7	4	3.9 {0.4}	
15*	0.4	6.6	6	5.9 {0.6}	
20*	0.4	6.6	8	7.8 {0.8}	
25*	0.45	11.7	10	9.8 {1 }	
30*	0.45	11.7	12	11.8 {1.2}	
35*	0.45	11.7	14	13.7 {1.4}	
40*	0.5	20	16	15.7 {1.6}	
UL 4- 5*	0.35	2.1	2	2.0 {0.2}	
10*	0.45	5.3	4	3.9 {0.4}	
15*	0.45	5.3	6	5.9 {0.6}	
20*	0.5	8	8	7.8 {0.8}	
25*	0.5	8	10	9.8 {1 }	
30*	0.55	12.7	12	11.8 {1.2}	
35*	0.55	12.7	14	13.7 {1.4}	
40	0.6	19.8	16	15.7 {1.6}	
45	0.6	19.8	18	17.7 {1.8}	
50	0.6	19.8	20	19.6 {2 }	
60	0.65	29.9	24	23.5 {2.4}	
UL 5- 5*	0.4	2.2	2	2.0 {0.2}	
10*	0.5	4.75	4	3.9 {0.4}	
15*	0.5	4.75	6	5.9 {0.6}	
20*	0.55	6.88	8	7.8 {0.8}	
25*	0.55	6.88	10	9.8 {1 }	
30	0.65	14.95	12	11.8 {1.2}	
35	0.65	14.95	14	13.7 {1.4}	
40	0.65	14.95	16	15.7 {1.6}	
45	0.7	21.7	18	17.7 {1.8}	
50	0.7	21.7	20	19.6 {2 }	
60	0.75	30.75	24	23.5 {2.4}	
UL 6- 5*	0.45	2.3	2	2.0 {0.2}	
10*	0.55	4.4	4	3.9 {0.4}	
15*	0.55	4.4	6	5.9 {0.6}	
20	0.65	8.5	8	7.8 {0.8}	
25	0.65	8.5	10	9.8 {1 }	
30	0.7	12.6	12	11.8 {1.2}	
35	0.7	12.6	14	13.7 {1.4}	
40	0.7	12.6	16	15.7 {1.6}	
45	0.75	17.3	18	17.7 {1.8}	
50	0.75	17.3	20	19.6 {2 }	
60	0.8	24.8	24	23.5 {2.4}	
70	0.8	24.8	28	27.5 {2.8}	



Alterations



Part Number - (LKC)
UL6-20 - LKC

Alterations	Code	Spec.																																																																		
	LKC	Changes length and spring constant tolerance. (Refer to the table below)																																																																		
		<table><tr><th>Part Number</th><th colspan="2">L</th><th rowspan="2">Alterations</th><th rowspan="2">Tolerance</th><th rowspan="2">Spring Constant Tolerance</th></tr><tr><th>Type</th><th>D</th><th>Specify in 5mm Increment</th></tr><tr><td rowspan="2">5</td><td></td><td>30-50</td><td rowspan="2"></td><td>±0.5</td><td rowspan="15">±5%</td></tr><tr><td></td><td>60</td><td>±0.8</td></tr><tr><td rowspan="2">6</td><td></td><td>20</td><td rowspan="2"></td><td>±0.4</td></tr><tr><td></td><td>25-50</td><td>±0.5</td></tr><tr><td rowspan="2">8</td><td></td><td>60, 70</td><td rowspan="2"></td><td>±0.8</td></tr><tr><td></td><td>10-20</td><td>±0.4</td></tr><tr><td rowspan="2">10</td><td></td><td>25-50</td><td rowspan="2"></td><td>±0.5</td></tr><tr><td></td><td>60, 70</td><td>±0.8</td></tr><tr><td rowspan="2">12</td><td></td><td>15-30</td><td rowspan="2"></td><td>±0.5</td></tr><tr><td></td><td>35-50</td><td>±0.5</td></tr><tr><td rowspan="2">16</td><td></td><td>60, 70, 80</td><td rowspan="2"></td><td>±0.8</td></tr><tr><td></td><td>20-30</td><td>±0.5</td></tr><tr><td rowspan="2">20</td><td></td><td>35-50</td><td rowspan="2"></td><td>±0.5</td></tr><tr><td></td><td>60, 70, 80</td><td>±0.8</td></tr></table>	Part Number	L		Alterations	Tolerance	Spring Constant Tolerance	Type	D	Specify in 5mm Increment	5		30-50		±0.5	±5%		60	±0.8	6		20		±0.4		25-50	±0.5	8		60, 70		±0.8		10-20	±0.4	10		25-50		±0.5		60, 70	±0.8	12		15-30		±0.5		35-50	±0.5	16		60, 70, 80		±0.8		20-30	±0.5	20		35-50		±0.5		60, 70, 80	±0.8
		Part Number	L		Alterations				Tolerance	Spring Constant Tolerance																																																										
		Type	D	Specify in 5mm Increment																																																																
		5		30-50		±0.5	±5%																																																													
				60		±0.8																																																														
		6		20		±0.4																																																														
				25-50		±0.5																																																														
		8		60, 70		±0.8																																																														
				10-20		±0.4																																																														
		10		25-50		±0.5																																																														
				60, 70		±0.8																																																														
		12		15-30		±0.5																																																														
				35-50		±0.5																																																														
		16		60, 70, 80		±0.8																																																														
	20-30		±0.5																																																																	
20		35-50		±0.5																																																																
		60, 70, 80		±0.8																																																																
⚠ Both ends are ground. ⚠ For orders larger than indicated quantity, please check with WOS. ⚠ Applicable to D5 or more.																																																																				

UTT: Fmax. (Allowable Deflection) =LxFa%

Part Number Type D-L	d	Solid Length	F max.	N{kkgf} Max.	Fa%	Unit Price
UTT 3- 5*	0.35	2.8	2	2.9 {0.3}	40	
10*	0.4	4.8	4	5.9 {0.6}		
15*	0.45	8.3	6	8.8 {0.9}		
20*	0.45	8.3	6	8.8 {0.9}	30	
25*	0.5	14	8	11.8 {1.2}	32	
30*	0.5	14	8	11.8 {1.2}	27	
UTT 4- 5*	0.4	2.6	2	2.9 {0.3}		
10*	0.45	3.9	4	5.9 {0.6}	40	
15*	0.5	6	6	8.8 {0.9}		
20*	0.55	9.4	8	11.8 {1.2}		
25	0.6	14.4	10	14.7 {1.5}		
30	0.6	14.4	10	14.7 {1.5}	33	
UTT 5- 5*	0.45	2.6	2	2.9 {0.3}		
10*	0.5	3.6	4	5.9 {0.6}		
15	0.6	7.5	6	8.8 {0.9}		
20	0.6	7.5	8	11.8 {1.2}	40	
25	0.65	10.7	10	14.7 {1.5}		
30	0.7	15.4	12	17.7 {1.8}		
35	0.7	15.4	14	20.6 {2.1}		
UTT 6- 5*	0.5	2.4	2	3.9 {0.4}		
10	0.6	4.2	4	7.8 {0.8}	40	
15	0.7	7.4	6	11.8 {1.2}		
20	0.7	7.4	8	15.7 {1.6}		
25	0.8	13.6	10	19.6 {2.0}		
30	0.8	13.6	12	23.5 {2.4}		
35	0.85	17.5	14	27.5 {2.8}		
40	0.9	23.4	16	31.4 {3.2}		
45	0.9	23.4	18	35.3 {3.6}		
50	0.9	23.4	18	35.3 {3.6}	36	
60	1.0	41	18	35.3 {3.6}	30	
70	1.0	41	24	47.1 {4.8}	34	



Ordering
Example

Part Number
UL16-80
UTT16-80

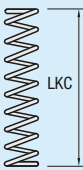
Spring Constant D12 is applicable to UY, UR, UF, UL and UBB Types only. D14 is applicable to UBB Type only.

Type	UV	UY	UR	UF	UL	UTT	UM	UH	UBB
2		0.05{0.005}	0.2{0.02}	0.3{0.03}	0.5{0.05}				
3						N/mm 1.5 {0.15}			
4	N/mm 0.05 {0.005}	N/mm 0.098 {0.01}					2.0{0.2}	2.9{0.3}	4.9{0.5}
5								N/mm 5.9 {0.6}	N/mm 9.8 {1.0}
6			N/mm 0.29 {0.03}	N/mm 0.49 {0.05}	N/mm 0.98 {0.1}				
8									
10						N/mm 2.0 {0.2}	N/mm 2.9 {0.3}	N/mm 9.8 {1.0}	N/mm 19.6 {2.0}
12		N/mm 0.2 {0.02}							
13									
14									
16									
20		0.3{0.03}	0.5{0.05}	0.98{0.1}	2.9{0.3}	3.9{0.4}	4.9{0.5}	14.7{1.5}	29.4{3.0}
Fmax.	F=Lx70%	F=LxFa%	F=LxFa%	F=Lx45%	F=Lx40%	F=LxFa%	F=LxFa%	F=LxFa%	F=LxFa%



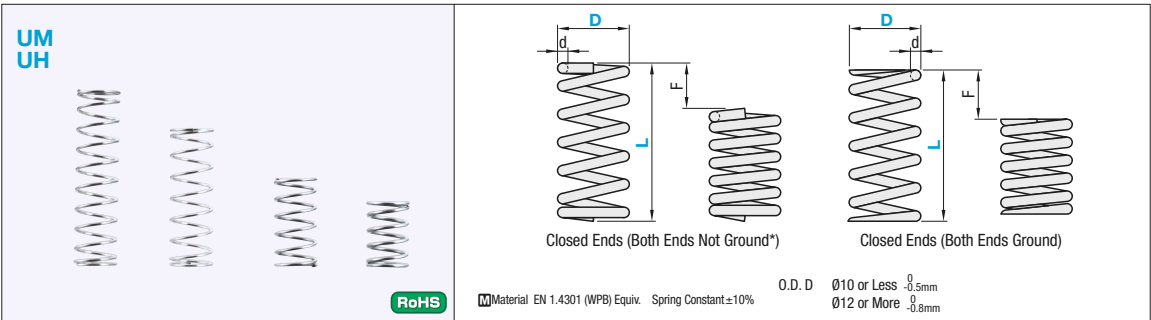
Alterations

Part Number - (LKC)
UTT6-35 - LKC

Alterations	Code	Spec.																																																										
	LKC	Changes length and spring constant tolerance. (Refer to the table below)																																																										
		<table><tr><th>Part Number</th><th colspan="3">L</th><th>Spring Constant Tolerance</th></tr><tr><th>Type</th><th>D</th><th>Specify in 5mm Increment</th><th>Alterations</th><th>Tolerance</th><th></th></tr><tr><td rowspan="10">UTT</td><td rowspan="10">LKC</td><td>5</td><td>15, 20</td><td></td><td>±0.4</td><td rowspan="10">±5%</td></tr><tr><td></td><td>25, 30</td><td></td><td>±0.5</td></tr><tr><td>6</td><td>10-20</td><td></td><td>±0.4</td></tr><tr><td>8</td><td>25-50</td><td></td><td>±0.5</td></tr><tr><td>10</td><td>60, 70</td><td></td><td>±0.8</td></tr><tr><td>13</td><td>15-30</td><td></td><td>±0.5</td></tr><tr><td>16</td><td>35-50</td><td></td><td>±0.5</td></tr><tr><td></td><td>60, 70, 80</td><td></td><td>±0.8</td></tr><tr><td></td><td>20-30</td><td></td><td>±0.5</td></tr><tr><td>20</td><td>35-50</td><td></td><td>±0.5</td></tr><tr><td></td><td>60, 70, 80</td><td></td><td>±0.8</td></tr></table>	Part Number	L			Spring Constant Tolerance	Type	D	Specify in 5mm Increment	Alterations	Tolerance		UTT	LKC	5	15, 20		±0.4	±5%		25, 30		±0.5	6	10-20		±0.4	8	25-50		±0.5	10	60, 70		±0.8	13	15-30		±0.5	16	35-50		±0.5		60, 70, 80		±0.8		20-30		±0.5	20	35-50		±0.5		60, 70, 80		±0.8
		Part Number	L			Spring Constant Tolerance																																																						
		Type	D	Specify in 5mm Increment	Alterations	Tolerance																																																						
		UTT	LKC	5	15, 20		±0.4	±5%																																																				
					25, 30		±0.5																																																					
				6	10-20		±0.4																																																					
				8	25-50		±0.5																																																					
				10	60, 70		±0.8																																																					
				13	15-30		±0.5																																																					
				16	35-50		±0.5																																																					
					60, 70, 80		±0.8																																																					
	20-30				±0.5																																																							
20	35-50				±0.5																																																							
	60, 70, 80		±0.8																																																									
⚠ Both ends are ground. ⚠ For orders larger than indicated quantity, please check with WOS. ⚠ Applicable to D5 or more.																																																												

Round Coil Springs

O.D. Referenced Stainless Steel



■UM: Fmax. (Allowable Deflection) =LxFa%

Part Number TypeD-L	d	Solid Length	F max.	N{kgf} max.	Fa%	Unit Price
UM 4- 5*	0.4	2.2	1.75	3.4 {0.35}	35	
10*	0.5	4.9	3.5	6.8 {0.7}		
15	0.55	7.5	5.25	10.3 {1.05}		
20	0.6	11.1	7	13.7 {1.4}		
25	0.6	11.1	8.75	17.2 {1.75}		
30	0.65	16.3	10.5	20.6 {2.1}		
UM 5- 5*	0.45	2.25	1.75	3.4 {0.35}	35	
10*	0.5	3.13	3.5	6.8 {0.7}		
15	0.65	8.45	5.25	10.3 {1.05}		
20	0.65	8.45	7	13.7 {1.4}		
25	0.7	11.9	8.75	17.2 {1.75}		
30	0.7	11.9	10.5	20.6 {2.1}		
35	0.75	16.5	12.25	24.0 {2.45}		
40	0.8	23.2	14	27.5 {2.8}		
45	0.8	23.2	15.75	30.9 {3.15}		
50	0.85	31.45	17.5	34.3 {3.5}		
UM 6- 5*	0.55	2.7	1.7	4.9 {0.5}	35	
10	0.7	5.6	3.5	10.8 {1.1}		
15	0.75	7.4	5.2	15.7 {1.6}		
20	0.75	7.4	7	20.6 {2.1}		
25	0.85	12.8	8.7	25.5 {2.6}		
30	0.85	12.8	10.5	31.4 {3.2}		
35	0.9	16.7	12.2	36.3 {3.7}		
40	0.9	16.8	14	41.2 {4.2}		
45	1.0	27.8	15.8	46.1 {4.7}		
50	1.0	28.0	17.5	52.0 {5.3}		
60	1.0	28.0	18	53.0 {5.4}	30	
70	1.1	46.2	20	58.8 {6}	28	
UM 8- 10	0.85	6.4	3.5	10.8 {1.1}	35	
15	0.9	7.9	5.2	15.7 {1.6}		
20	0.9	7.9	7	20.6 {2.1}		
25	0.9	7.9	8.7	25.5 {2.6}		
30	1.0	12.0	10.5	31.4 {3.2}		
35	1.0	12.0	12.2	36.3 {3.7}		
40	1.1	18.7	14	41.2 {4.2}		
45	1.1	18.7	15.8	46.1 {4.7}		
50	1.1	18.7	17.5	52.0 {5.3}		
60	1.2	28.2	21	61.8 {6.3}		
70	1.3	42.0	24.5	72.6 {7.4}		



Alterations



Part Number - (LKC)
UM6-30 - LKC

Alterations	Code	Spec.																																															
	LKC	Changes length and spring constant tolerance. (Refer to the table below)																																															
		<table><tr><th>Part Number</th><th colspan="2">L</th><th rowspan="2">Spring Constant Tolerance</th></tr><tr><th>Type D</th><th>Specify in 5mm Increment</th><th>Alterations</th><th>Tolerance</th></tr><tr><td rowspan="14">UM</td><td rowspan="14">LKC</td><td>4</td><td>15, 20</td><td>±0.4</td><td rowspan="14">±5%</td></tr><tr><td></td><td>25, 30</td><td>±0.5</td></tr><tr><td rowspan="2">5</td><td>15, 20</td><td>±0.4</td></tr><tr><td>25-50</td><td>±0.5</td></tr><tr><td rowspan="2">6</td><td>10-20</td><td>±0.4</td></tr><tr><td>25-50</td><td>±0.5</td></tr><tr><td rowspan="2">8</td><td></td><td>±0.5</td></tr><tr><td>60, 70</td><td>±0.8</td></tr><tr><td rowspan="2">13</td><td>15-30</td><td>±0.5</td></tr><tr><td>35-50</td><td>±0.5</td></tr><tr><td rowspan="2">16</td><td>60, 70, 80</td><td>±0.8</td></tr><tr><td>20-30</td><td>±0.5</td></tr><tr><td rowspan="2">20</td><td>35-50</td><td>±0.5</td></tr><tr><td>60, 70, 80</td><td>±0.8</td></tr></table>	Part Number	L		Spring Constant Tolerance	Type D	Specify in 5mm Increment	Alterations	Tolerance	UM	LKC	4	15, 20	±0.4	±5%		25, 30	±0.5	5	15, 20	±0.4	25-50	±0.5	6	10-20	±0.4	25-50	±0.5	8		±0.5	60, 70	±0.8	13	15-30	±0.5	35-50	±0.5	16	60, 70, 80	±0.8	20-30	±0.5	20	35-50	±0.5	60, 70, 80	±0.8
		Part Number	L		Spring Constant Tolerance																																												
		Type D	Specify in 5mm Increment	Alterations		Tolerance																																											
		UM	LKC	4	15, 20	±0.4	±5%																																										
					25, 30	±0.5																																											
				5	15, 20	±0.4																																											
					25-50	±0.5																																											
				6	10-20	±0.4																																											
					25-50	±0.5																																											
				8		±0.5																																											
					60, 70	±0.8																																											
				13	15-30	±0.5																																											
					35-50	±0.5																																											
				16	60, 70, 80	±0.8																																											
20-30	±0.5																																																
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	60, 70, 80			±0.8																																													
ⓘ Both ends are ground. ⓘ For orders larger than indicated quantity, please check with WOS.																																																	

■UH: Fmax. (Allowable Deflection)=LxFa%

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	Unit Price
UH 4- 5*	0.45	2.7	1.5	4.4 {0.45}	30	
10*	0.5	3.8	3	8.8 {0.9}		
15	0.6	8.1	4.5	13.2 {1.35}		
20	0.65	11.7	6	17.6 {1.8}		
25	0.7	16.8	7.5	22.1 {2.25}		
30	0.7	16.8	9	26.5 {2.7}		
UH 5- 5*	0.55	3.3	1.5	4.4 {0.45}	30	
10	0.6	4.65	3	8.8 {0.9}		
15	0.6	4.65	4.5	13.2 {1.35}		
20	0.75	11.81	6	17.6 {1.8}		
25	0.75	11.81	7.5	22.1 {2.25}		
30	0.8	16	9	26.5 {2.7}		
35	0.85	21.68	10.5	30.9 {3.15}		
40	0.85	21.68	12	35.3 {3.6}		
45	0.9	28.8	13.5	39.7 {4.05}		
UH 6- 5*	0.65	3.2	1.5	8.8 {0.9}	30	
10	0.7	3.9	3	17.7 {1.8}		
15	0.85	7.7	4.5	26.5 {2.7}		
20	0.9	9.7	6	35.3 {3.6}		
25	1.0	15.5	7.5	44.1 {4.5}		
30	1.0	15.5	9	53.0 {5.4}		
35	1.1	24.8	9.8	57.9 {5.9}		
40	1.1	24.8	10	58.8 {6}		
45	1.1	24.8	11.3	66.7 {6.8}		
50	1.2	39.0	10	58.8 {6}		
60	1.2	39.0	14	82.4 {8.4}		
70	1.2	39.0	15	88.3 {9}		
UH 8- 10	0.9	5.3	3	17.7 {1.8}	30	
15	0.9	5.3	4.5	26.5 {2.7}		
20	1.1	11	6	35.3 {3.6}		
25	1.1	11	7.5	44.1 {4.5}		
30	1.2	15.9	9	53.0 {5.4}		
35	1.2	15.9	10.5	61.8 {6.3}		
40	1.3	23.1	12	70.6 {7.2}		
45	1.3	23.1	13.5	79.4 {8.1}		
50	1.4	33.3	15	88.3 {9}		
60	1.4	33.3	18	105.9 {10.8}		
70	1.5	48.0	19	111.8 {11.4}		



Ordering Example

Part Number

UM16-80
UH16-80

■Spring Constant D12 is applicable to UY, UR, UF, UL and UBB Types only. D14 is applicable to UBB Type only.

Type	UV	UY	UR	UF	UL	UTT	UM	UH	UBB
2		0.05{0.005}	0.2{0.02}	0.3{0.03}	0.5{0.05}				
3									
4	N/mm 0.05 {0.005}	N/mm 0.098 {0.01}							
5			N/mm 0.29 {0.03}	N/mm 0.49 {0.05}	N/mm 0.98 {0.1}				
6									
8									
10									
12		N/mm 0.2 {0.02}							
13									
14									
16									
20		0.3{0.03}	0.5{0.05}	0.98{0.1}	2.9{0.3}	3.9{0.4}	4.9{0.5}	14.7{1.5}	29.4{3.0}
Fmax.	F=Lx70%	F=LxFa%	F=LxFa%	F=Lx45%	F=Lx40%	F=LxFa%	F=LxFa%	F=LxFa%	F=LxFa%



Alterations



Part Number - (LKC)
UH20-25 - LKC

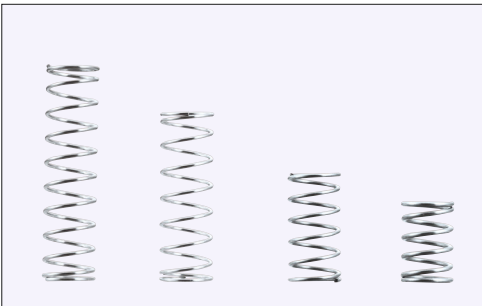
Alterations	Code	Spec.																																													
	LKC	Changes length and spring constant tolerance. (Refer to the table below)																																													
		<table><tr><th>Part Number</th><th colspan="2">L</th><th rowspan="2">Spring Constant Tolerance</th></tr><tr><th>Type D</th><th>Specify in 5mm Increment</th><th>Alterations</th><th>Tolerance</th></tr><tr><td rowspan="2">4</td><td>15, 20</td><td rowspan="14">LKC</td><td>±0.4</td><td rowspan="14">±5%</td></tr><tr><td>25, 30</td><td>±0.5</td></tr><tr><td rowspan="2">5</td><td>10-20</td><td>±0.4</td></tr><tr><td>25-45</td><td>±0.5</td></tr><tr><td rowspan="2">6</td><td>10-20</td><td>±0.4</td></tr><tr><td>25-50</td><td>±0.5</td></tr><tr><td rowspan="2">8</td><td>60, 70</td><td>±0.8</td></tr><tr><td>15-30</td><td>±0.5</td></tr><tr><td rowspan="2">13</td><td>35-50</td><td>±0.5</td></tr><tr><td>60, 70, 80</td><td>±0.8</td></tr><tr><td rowspan="2">16</td><td>25, 30</td><td>±0.5</td></tr><tr><td>60, 70, 80</td><td>±0.8</td></tr><tr><td rowspan="2">20</td><td>35-50</td><td>±0.8</td></tr><tr><td>60, 70, 80</td><td>±0.8</td></tr></table>	Part Number	L		Spring Constant Tolerance	Type D	Specify in 5mm Increment	Alterations	Tolerance	4	15, 20	LKC	±0.4	±5%	25, 30	±0.5	5	10-20	±0.4	25-45	±0.5	6	10-20	±0.4	25-50	±0.5	8	60, 70	±0.8	15-30	±0.5	13	35-50	±0.5	60, 70, 80	±0.8	16	25, 30	±0.5	60, 70, 80	±0.8	20	35-50	±0.8	60, 70, 80	±0.8
		Part Number	L		Spring Constant Tolerance																																										
		Type D	Specify in 5mm Increment	Alterations		Tolerance																																									
		4	15, 20	LKC	±0.4	±5%																																									
			25, 30		±0.5																																										
		5	10-20		±0.4																																										
			25-45		±0.5																																										
		6	10-20		±0.4																																										
			25-50		±0.5																																										
		8	60, 70		±0.8																																										
			15-30		±0.5																																										
		13	35-50		±0.5																																										
			60, 70, 80		±0.8																																										
16	25, 30	±0.5																																													
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⚠ Both ends are ground. ⚠ For orders larger than indicated quantity, please check with WOS.																																															

Round Coil Springs

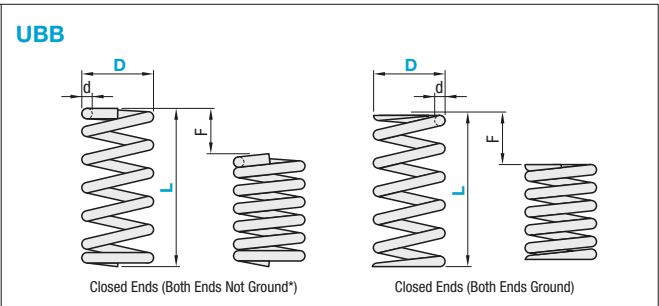
O.D. Referenced Stainless Steel

Round Coil Springs

L Dimension Configurable / O.D. Referenced Stainless Steel



UBB



Closed Ends (Both Ends Not Ground*) Closed Ends (Both Ends Ground)

Spring Constant±10% O.D. D Ø10 or Less 0.5mm Free Length L 50 or Less ±1.5mm
Ø12 or More 0.8mm 55 or More ±2.5mm

RoHS

Material EN 1.4301 (WPB) Equiv.

■UBB: Fmax. (Allowable Deflection)=LxFa%

Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	Unit Price	Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	Unit Price	Part Number Type D-L	d	Solid Length	F max.	N{kgf} max.	Fa%	Unit Price
UBB4-5	0.55	3.3	1.25	6.1 {0.63}			UBB13-15	1.8	9.5	3.75	73.5 {7.5}			UBB16-15	2	10.0	3.75	73.5 {7.5}		
10	0.65	7.0	2.5	12.3 {1.3}	25		20	1.9	12.9	5	98.1 {10.0}			20	2.1	12.1	5	98.1 {10.0}		
15	0.7	10.3	3.75	18.4 {1.9}			25	2	17.0	6.25	123 {12.5}			25	2.3	17.3	6.25	123 {12.5}		
20	0.75	14.4	5	24.5 {2.5}			30	2.1	20.5	7.5	147 {15.0}	25		30	2.4	21.0	7.5	147 {15.0}		
25	0.8	19.4	5	24.5 {2.5}	20		40	2.3	28.2	10	196 {20.0}			35	2.5	24.4	8.75	172 {17.5}		
UBB5-5	0.6	2.9	1.25	6.1 {0.63}			45	2.3	32.2	11.25	221 {22.5}			40	2.6	28.0	10	196 {20.0}		
10	0.75	6.9	2.5	12.3 {1.3}			50	2.4	36.0	12.5	245 {25.0}			45	2.7	31.7	11.25	221 {22.5}		
15	0.8	9.8	3.75	18.4 {1.9}			60	2.5	44.4	12	235 {24.0}			50	2.7	35.8	12.5	245 {25.0}		
20	0.85	13.4	5	24.5 {2.5}	25		70	2.6	54.0	14	275 {28.0}	20		60	2.9	43.5	15	294 {30.0}		
25	0.9	17.8	6.25	30.6 {3.1}			UBB14-15	1.9	10.0	3.75	73.5 {7.5}			70	2.9	49.4	17.5	343 {35.0}		
30	0.9	21.8	7.5	36.8 {3.8}			20	2	13.5	5	98.1 {10.0}			80	3	59.3	16	314 {32.0}	20	
UBB6-5	0.8	3.6	1.25	12.3 {1.3}			25	2.1	16.3	6.25	123 {12.5}			UBB20-25	2.9	16.7	6.25	184 {18.8}		
10	0.9	6.8	2.5	24.5 {2.5}	25		30	2.3	21.3	7.5	147 {15.0}	25		30	3	20.3	7.5	221 {22.5}		
15	1	10.5	3.75	36.8 {3.8}			35	2.3	24.7	8.75	172 {17.5}			35	3	22.7	8.75	257 {26.3}		
20	1.1	14.6	5	49.0 {5.0}			40	2.4	28.2	10	196 {20.0}			40	3.2	27.2	10	294 {30.0}		
25	1.1	17.9	6.25	61.3 {6.3}			60	2.6	43.6	15	294 {30.0}			45	3.2	29.6	9	265 {27.0}		
30	1.2	23.1	6	58.8 {6.0}			80	2.7	61.4	16	314 {32.0}	20		50	3.4	38.3	10	294 {30.0}		
35	1.2	27.3	7	68.6 {7.0}										60	3.5	44.6	12	353 {36.0}		
40	1.2	31.2	8	78.5 {8.0}	20															
45	1.3	34.8	9	88.3 {9.0}																
50	1.3	38.4	10	98.1 {10.0}																
60	1.3	44.2	9	88.3 {9.0}	15															
70	1.4	58.5	10.5	103 {10.5}																
UBB8-10	1.1	6.9	2.5	24.5 {2.5}																
15	1.2	9.9	3.75	36.8 {3.8}																
20	1.3	14.0	5	49.0 {5.0}																
25	1.3	14.5	6.25	61.3 {6.3}	25															
30	1.4	21.4	7.5	73.5 {7.5}																
35	1.4	22.0	8.75	85.8 {8.8}																
40	1.5	28.9	10	98.1 {10.0}																
45	1.5	32.6	11.25	110 {11.3}																
UBB10-10	1.3	7.2	2.5	24.5 {2.5}																
15	1.4	10.2	3.75	36.8 {3.8}																
20	1.5	13.9	5	49.0 {5.0}																
25	1.5	16.1	6.25	61.3 {6.3}																
30	1.6	20.4	7.5	73.5 {7.5}																
35	1.6	22.8	8.75	85.8 {8.8}	25															
40	1.7	27.2	10	98.1 {10.0}																
45	1.7	30.6	11.25	110 {11.3}																
50	1.8	36.5	12.5	123 {12.5}																
60	1.8	41.4	15	147 {15.0}																
70	1.9	50.8	17.5	172 {17.5}																
UBB12-15	1.5	9.4	3.75	36.8 {3.8}																
20	1.6	12.4	5	49.0 {5.0}																
25	1.7	16.2	6.25	61.3 {6.3}																
30	1.8	20.3	7.5	73.5 {7.5}																
40	1.9	28.0	10	98.1 {10.0}	25															
50	2	35.5	12.5	123 {12.5}																
60	2.1	43.6	15	147 {15.0}																
70	2.1	48.8	17.5	172 {17.5}																
80	2.2	58.5	20	196 {20.0}																

kgf (Load)=N/mm (Spring Constant) x0.101972x(F Deflection)
(kgf)=N x0.101972

- For Types marked with *, both ends are not ground.
- The values of solid length are for reference only.
- There may be some variations depending on the lot.
- Usage Count: 1 Million Times

Spring Constant

⚠D12 is applicable to UY, UR, UF, UL and UBB Types only. D14 is applicable to UBB Type only.

D	Type	UV	UY	UR	UF	UL	UTT	UM	UH	UBB
2			0.05{0.005}	0.2{0.02}	0.3{0.03}	0.5{0.05}				
3										
4	N/mm 0.05 {kgf/mm} {0.005}	N/mm 0.098 {kgf/mm} {0.01}					N/mm 1.5 {kgf/mm} {0.15}	2.0{0.2}	2.9{0.3}	4.9{0.5}
5										
6										
8										
10										
12										
13										
14										
16										
20										
Fmax.	F=Lx70%	F=LxFa%	F=LxFa%	F=Lx45%	F=Lx40%	F=LxFa%	F=LxFa%	F=LxFa%	F=LxFa%	F=LxFa%



Ordering
Example

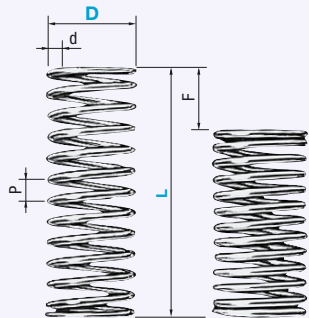
Part Number

UBB16-80

Compression Springs

Type	Allowable Deflection	Material
FWR	F=Lx60%	JIS-SWP-A
FWF	F=Lx50%	
FWT	F=Lx40%	
FUR	F=Lx60%	EN 1.4301 (WPB) Equiv.
FUF	F=Lx50%	
FUT	F=Lx40%	

- Use within the range of allowable deflection %.
- No grinding on both ends for d less than 0.9.
- P is for reference only.



<How to Calculate Spring Constant>

$$\text{Spring Constant} = \frac{\text{Max. Load (N(kgf))}}{\text{Lx Allowable Deflection (\%)}}$$

D Tolerance	Ø5~14	±0.3
	Ø16~20	±0.4
L Tolerance	~ 50	±1
	51~100	±2
	101~200	±4

RoHS

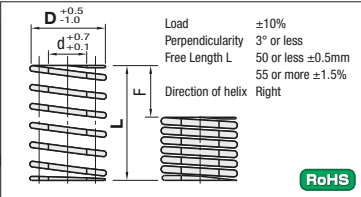
Part Number		1mm Increment L	Load Type Selection	Max. Load N[kgf]						d			P (Reference)		
Type	D			JIS-SWP-A			EN 1.4301 (WPB) Equiv.			FWR FUR	FWF FUF	FWT FUT	FWR FUR	FWF FUF	FWT FUT
FWR FWF FWT	5	15~65	A	2.8(0.29)	5.2(0.53)	8.1(0.83)	2.5(0.25)	4.5(0.46)	7.1(0.73)	0.4	0.5	0.6	1.8	1.5	1.3
			B	3.7(0.38)	6.7(0.69)	10.6(1.08)	3.3(0.33)	5.9(0.60)	9.3(0.95)				2.3	1.9	1.7
	6	15~80	A	2.9(0.30)	7.3(0.75)	9.9(1.01)	2.5(0.26)	6.4(0.65)	8.7(0.89)	0.45	0.6	0.7	2.0	1.7	1.5
			B	3.8(0.38)	9.6(0.97)	12.9(1.32)	3.3(0.34)	8.4(0.85)	11.3(1.15)				2.6	2.3	1.9
	7	15~90	A	3.1(0.32)	10.1(1.03)	11.5(1.17)	2.7(0.28)	8.8(0.90)	10.0(1.02)	0.5	0.7	0.8	2.2	2.0	1.7
			B	4.0(0.41)	13.1(1.34)	14.9(1.52)	3.5(0.36)	11.5(1.17)	13.0(1.33)				2.9	2.7	2.2
	8	20~100	A	5.2(0.53)	12.2(1.24)	13.8(1.41)	4.6(0.47)	10.7(1.09)	12.1(1.23)	0.6	0.8	0.9	2.7	2.2	1.9
			B	6.8(0.70)	15.9(1.62)	17.9(1.83)	6.0(0.61)	13.9(1.42)	15.7(1.60)				3.5	2.9	2.4
	10	20~120	A	10.6(1.08)	19.2(1.96)	30.5(3.11)	9.3(0.95)	16.9(1.72)	26.7(2.72)	0.8	1.0	1.2	3.4	2.8	2.5
			B	13.7(1.40)	24.9(2.54)	39.5(4.03)	12.1(1.23)	21.8(2.22)	34.6(3.53)				4.4	3.6	3.2
	12	25~140	A	11.0(1.12)	27.6(2.81)	37.7(3.84)	9.6(0.98)	24.1(2.46)	33.0(3.34)	0.9	1.2	1.4	3.8	3.3	2.9
			B	14.2(1.45)	35.8(3.65)	48.9(4.99)	12.5(1.27)	31.3(3.19)	42.9(4.37)				4.9	4.3	3.8
FUR FUF FUT	14	30~160	A	11.6(1.18)	37.7(3.84)	45.9(4.68)	10.1(1.03)	33.0(3.36)	40.2(4.10)	1.0	1.4	1.6	4.2	3.9	3.3
			B	15.1(1.54)	48.9(4.99)	59.6(6.08)	13.1(1.34)	42.8(4.36)	52.2(5.32)				5.5	5.1	4.3
(Stainless Steel)	16	30~180	A	19.4(1.98)	49.7(5.07)	55.1(5.62)	17.0(1.73)	43.4(4.43)	48.2(4.91)	1.2	1.6	1.8	5.0	4.5	3.7
			B	25.1(2.56)	64.5(6.58)	71.2(7.26)	22.0(2.24)	56.5(5.76)	62.6(6.38)				6.5	5.8	4.8
	18	35~200	A	29.9(3.05)	62.1(6.33)	65.2(6.65)	26.2(2.67)	54.3(5.54)	57.5(5.82)	1.4	1.8	2.0	5.9	5.0	4.1
			B	38.3(3.97)	80.7(8.23)	84.6(8.63)	34.0(3.47)	70.6(7.2)	74.0(7.55)				7.7	6.5	5.4
	20	40~200	A	42.7(4.35)	76.9(7.84)	99.0(10.1)	37.4(3.81)	67.3(6.86)	86.6(8.83)	1.6	2.0	2.3	6.7	5.5	4.8
			B	55.2(5.63)	100(10.2)	128(13.1)	48.3(4.93)	87.2(8.89)	113(11.5)				8.7	7.2	6.3
	23	45~200	A	51.9(5.29)	103.0(10.50)	121.0(12.34)	45.4(4.63)	90.2(9.20)	106.0(10.81)	1.8	2.3	2.6	7.8	6.4	5.5
			B	67.4(6.87)	133.0(13.56)	156.0(15.91)	58.9(6.01)	113.0(11.52)	137.0(13.97)				10.1	8.1	7.7

Coil Spring

For Ultra High Deflection SWY

Coil Spring

For Ultra Deflection SWU



RoHS

D	d	L	Spring Constant N/mm(kgf/mm)	F=Lx65% Fmm	Load N(kgf)	Part Number Type D-L	Unit Price
11	7	20	2.26(0.23)	13.0	29.4 {3.0}	SWY 11- 20	
		25	1.81(0.18)	16.3			
		30	1.51(0.15)	19.5			
		35	1.29(0.13)	22.8			
		40	1.13(0.12)	26.0			
		45	1.01(0.10)	29.3			
		50	0.91(0.092)	32.5			
		55	0.82(0.084)	35.8			
		60	0.75(0.077)	39.0			
		65	0.70(0.071)	42.3			
12.5	8.5	70	0.65(0.066)	45.5	40.2 {4.1}	SWY 12.5- 20	
		75	0.60(0.061)	48.8			
		80	0.57(0.058)	52.0			
		90	0.50(0.051)	58.5			
		100	0.45(0.046)	65.0			
		20	3.09(0.32)	13.0			
		25	2.47(0.25)	16.3			
		30	2.06(0.21)	19.5			
		35	1.77(0.18)	22.8			
		40	1.55(0.16)	26.0			
16.5	10.5	45	1.37(0.14)	29.3	91.2 {9.3}	SWY 16.5- 20	
		50	1.24(0.13)	32.5			
		55	1.12(0.11)	35.8			
		60	1.03(0.11)	39.0			
		65	0.95(0.10)	42.3			
		70	0.88(0.090)	45.5			
		75	0.82(0.084)	48.8			
		80	0.77(0.079)	52.0			
		90	0.69(0.070)	58.5			
		100	0.62(0.063)	65.0			
16.5	10.5	110	0.56(0.057)	71.5	91.2 {9.3}	SWY 16.5- 20	
		120	0.52(0.053)	78.0			
		125	0.49(0.050)	81.3			
		20	7.02(0.72)	13.0			
		25	5.61(0.57)	16.3			
		30	4.68(0.48)	19.5			
		35	4.01(0.41)	22.8			
		40	3.51(0.36)	26.0			
		45	3.12(0.32)	29.3			
		50	2.81(0.29)	32.5			
16.5	10.5	55	2.55(0.26)	35.8	91.2 {9.3}	SWY 16.5- 20	
		60	2.34(0.24)	39.0			
		65	2.16(0.22)	42.3			
		70	2.00(0.20)	45.5			
		75	1.87(0.19)	48.8			
		80	1.75(0.18)	52.0			
		90	1.56(0.16)	58.5			
		100	1.40(0.14)	65.0			
		110	1.28(0.13)	71.5			
		120	1.17(0.12)	78.0			
16.5	10.5	125	1.12(0.11)	81.3	91.2 {9.3}	SWY 16.5- 20	
		150	0.94(0.10)	97.5			
		20	7.02(0.72)	13.0			
		25	5.61(0.57)	16.3			
		30	4.68(0.48)	19.5			
		35	4.01(0.41)	22.8			
		40	3.51(0.36)	26.0			
		45	3.12(0.32)	29.3			
		50	2.81(0.29)	32.5			
		55	2.55(0.26)	35.8			



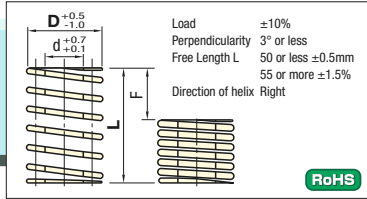
Ordering
Example

Part Number
SWY 12.5-40

D	d	L	Spring Constant	F=Lx65%		Part Number	Unit Price
			N/mm(kgf/mm)	Fmm	Load N(kgf)	Type D-L	
20.5	13.5	30	5.58(0.57)	19.5	108.9 (11.1)	SWY20.5- 30	30
		35	4.78(0.49)	22.8		35	
		40	4.19(0.43)	26.0		40	
		45	3.72(0.38)	29.3		45	
		50	3.35(0.34)	32.5		50	
		55	3.04(0.31)	35.8		55	
		60	2.79(0.28)	39.0		60	
		65	2.58(0.26)	42.3		65	
		70	2.39(0.24)	45.5		70	
		75	2.23(0.23)	48.8		75	
		80	2.09(0.21)	52.0		80	
		90	1.86(0.19)	58.5		90	
		100	1.67(0.17)	65.0		100	
		110	1.52(0.16)	71.5		110	
		120	1.40(0.14)	78.0		120	
125	1.34(0.14)	81.3	125				
130	1.29(0.13)	84.5	130				
140	1.20(0.12)	91.0	140				
150	1.12(0.11)	97.5	150				
24.5	16.5	30	6.99(0.71)	19.5	136.3 (13.9)	SWY24.5- 30	30
		35	5.99(0.61)	22.8		35	
		40	5.24(0.53)	26.0		40	
		45	4.66(0.48)	29.3		45	
		50	4.19(0.43)	32.5		50	
		55	3.81(0.39)	35.8		55	
		60	3.50(0.36)	39.0		60	
		65	3.23(0.33)	42.3		65	
		70	3.00(0.31)	45.5		70	
		75	2.80(0.29)	48.8		75	
		80	2.62(0.27)	52.0		80	
		90	2.33(0.24)	58.5		90	
		100	2.10(0.21)	65.0		100	
		110	1.91(0.19)	71.5		110	
		120	1.75(0.18)	78.0		120	
125	1.68(0.17)	81.3	125				
130	1.61(0.16)	84.5	130				
140	1.50(0.15)	91.0	140				
150	1.40(0.14)	97.5	150				
175	1.20(0.12)	113.8	175				
200	1.05(0.11)	130.0	200				
30	21	35	8.79(0.90)	22.8	200.1 (20.4)	SWY 30- 35	35
		40	7.69(0.78)	26.0		40	
		45	6.84(0.70)	29.3		45	
		50	6.16(0.63)	32.5		50	
		55	5.60(0.57)	35.8		55	
		60	5.13(0.52)	39.0		60	
		65	4.74(0.48)	42.3		65	
		70	4.40(0.45)	45.5		70	
		75	4.10(0.42)	48.8		75	
		80	3.85(0.39)	52.0		80	
		90	3.42(0.35)	58.5		90	
		100	3.08(0.31)	65.0		100	
		110	2.80(0.29)	71.5		110	
		120	2.56(0.26)	78.0		120	
		125	2.46(0.25)	81.3		125	
130	2.37(0.24)	84.5	130				
140	2.20(0.22)	91.0	140				
150	2.05(0.21)	97.5	150				
160	1.92(0.20)	104.0	160				
170	1.81(0.18)	110.5	170				
175	1.76(0.18)	113.8	175				
180	1.71(0.17)	117.0	180				
190	1.62(0.17)	123.5	190				
200	1.54(0.16)	130.0	200				
250	1.23(0.13)	162.5	250				
300	1.03(0.10)	195.0	300				

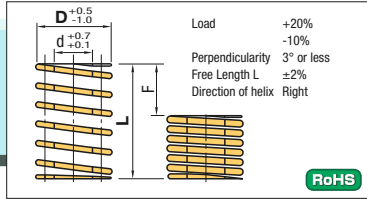
Coil Spring

For High Deflection SWR



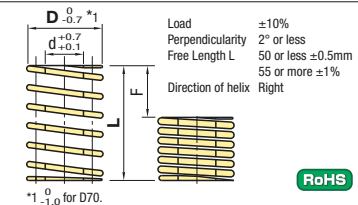
Coil Spring

For Medium Deflection SWS



D	d	L	N/mm (kgf/mm) (Spring Constant)	F=Lx50% Fmm	N(kgf) Load	Part Number Type D-L	Unit Price
10.5	6.0	15	10.46(1.07)	7.5	78.5 (8.0)	SWR105-	15
		20	7.85(0.80)	10.0			20
		25	6.28(0.64)	12.5			25
		30	5.23(0.53)	15.0			30
		35	4.48(0.46)	17.5			35
		40	3.92(0.40)	20.0			40
		45	3.49(0.36)	22.5			45
		50	3.14(0.32)	25.0			50
		55	2.85(0.29)	27.5			55
		60	2.62(0.27)	30.0			60
12.5	7.0	65	2.41(0.25)	32.5	88.3 (9.0)		65
		70	2.24(0.23)	35.0			70
		75	2.09(0.21)	37.5			75
		80	1.96(0.20)	40.0			80
		85	1.96(0.20)	40.0			85
		90	1.96(0.20)	40.0			90
		100	1.77(0.18)	50.0			100
		15	11.77(1.20)	7.5		SWR125-	15
		20	8.83(0.90)	10.0			20
		14.5	8.5	25		7.06(0.72)	12.5
30	5.88(0.60)			15.0		30	
35	5.04(0.51)			17.5		35	
40	4.41(0.45)			20.0		40	
45	3.92(0.40)			22.5		45	
50	3.53(0.36)			25.0		50	
55	3.21(0.33)			27.5		55	
60	2.94(0.30)			30.0		60	
65	2.72(0.28)			32.5		65	
17	10.5			70	2.52(0.26)	35.0	196.1 (20.0)
		75	2.35(0.24)	37.5		75	
		80	2.21(0.23)	40.0		80	
		90	1.96(0.20)	45.0		90	
		100	1.77(0.18)	50.0		100	
		125	1.41(0.14)	62.5		125	
		150	1.18(0.12)	75.0		150	
		20	19.61(2.00)	10.0	SWR17-	20	
		25	15.69(1.60)	12.5		25	
		19	12.5	30	13.08(1.33)	15.0	
35	11.21(1.14)			17.5		35	
40	9.81(1.00)			20.0		40	
45	8.72(0.89)			22.5		45	
50	7.85(0.80)			25.0		50	
55	7.13(0.73)			27.5		55	
60	6.54(0.67)			30.0		60	
65	6.03(0.62)			32.5		65	
70	5.60(0.57)			35.0		70	
21	14.5			75	5.23(0.53)	37.5	265.1 (26.0)
		80	4.90(0.50)	40.0		80	
		90	4.36(0.44)	45.0		90	
		100	3.92(0.40)	50.0		100	
		125	3.14(0.32)	62.5		125	
		150	2.62(0.27)	75.0		150	
		175	2.24(0.23)	87.5		175	
		20	21.91(2.20)	10.0	SWR21-	20	
		25	16.81(1.71)	12.5		25	
		23	16.5	30	14.71(1.50)	15.0	
35	13.08(1.33)			17.5		35	
40	11.77(1.20)			20.0		40	
45	11.07(1.09)			22.5		45	
50	10.41(1.04)			25.0		50	
55	9.81(1.00)			27.5		55	
60	9.28(0.96)			30.0		60	
65	8.81(0.92)			32.5		65	
70	8.41(0.86)			35.0		70	
25	18.5			75	8.05(0.82)	37.5	311.1 (31.0)
		80	7.75(0.79)	40.0		80	
		90	7.48(0.76)	42.5		90	
		100	7.25(0.73)	45.0		100	
		110	6.88(0.69)	50.0		110	
		120	6.54(0.67)	55.0		120	
		125	6.28(0.64)	60.0		125	
		130	6.03(0.62)	65.0		130	
		140	5.77(0.59)	70.0		140	
		27	20.5	150	5.23(0.53)	75.0	
175	4.48(0.46)			87.5		175	
200	3.92(0.40)			100.0		200	
225	3.49(0.36)			112.5		225	
250	3.14(0.32)			125.0		250	
275	2.85(0.29)			137.5		275	
300	2.62(0.27)			150.0		300	
325	2.41(0.25)			162.5		325	
350	2.24(0.23)			175.0		350	
375	2.09(0.21)			187.5		375	
29	22.5	400	1.96(0.20)	200.0	357.1 (35.0)		400
		425	1.77(0.18)	212.5			425
		450	1.59(0.16)	225.0			450
		475	1.41(0.14)	237.5			475
		500	1.25(0.12)	250.0			500
		525	1.10(0.11)	262.5			525
		550	0.98(0.10)	275.0			550
		575	0.88(0.09)	287.5			575
		600	0.80(0.08)	300.0			600
		625	0.73(0.07)	312.5			625
31	24.5	650	0.65(0.06)	325.0	380.1 (38.0)		650
		675	0.59(0.06)	337.5			675
		700	0.54(0.05)	350.0			700
		725	0.50(0.05)	362.5			725
		750	0.46(0.04)	375.0			750
		775	0.43(0.04)	387.5			775
		800	0.40(0.04)	400.0			800
		825	0.38(0.03)	412.5			825
		850	0.35(0.03)	425.0			850
		875	0.33(0.03)	437.5			875
33	26.5	900	0.31(0.03)	450.0	403.1 (40.0)		900
		925	0.29(0.03)	462.5			925
		950	0.27(0.02)	475.0			950
		975	0.26(0.02)	487.5			975
		1000	0.24(0.02)	500.0			1000
		1025	0.23(0.02)	512.5			1025
		1050	0.22(0.02)	525.0			1050
		1075	0.21(0.02)	537.5			1075
		1100	0.20(0.02)	550.0			1100
		1125	0.19(0.02)	562.5			1125
35	28.5	1150	0.18(0.02)	575.0	426.1 (42.0)		1150
		1175	0.17(0.02)	587.5			1175
		1200	0.16(0.02)	600.0			1200
		1225	0.15(0.02)	612.5			1225
		1250	0.14(0.02)	625.0			1250
		1275	0.13(0.02)	637.5			1275
		1300	0.13(0.02)	650.0			1300
		1325	0.12(0.02)	662.5			1325
		1350	0.11(0.02)	675.0			1350
		1375	0.11(0.02)	687.5			1375
37	30.5	1400	0.10(0.02)	700.0	449.1 (44.0)		1400
		1425	0.10(0.02)	712.5			1425
		1450	0.09(0.02)	725.0			1450
		1475	0.09(0.02)	737.5			1475
		1500	0.08(0.02)	750.0			1500
		1525	0.08(0.02)	762.5			1525
		1550	0.08(0.02)	775.0			1550
		1575	0.07(0.02)	787.5			1575
		1600	0.07(0.02)	800.0			1600
		1625	0.07(0.02)	812.5			1625
39	32.5	1650	0.06(0.02)	825.0	472.1 (47.0)		1650
		1675	0.06(0.02)	837.5			1675
		1700	0.06(0.02)	850.0			1700
		1725	0.05(0.02)	862.5			1725
		1750	0.05(0.02)	875.0			1750
		1775	0.05(0.02)	887.5			1775
		1800	0.05(0.02)	900.0			1800
		1825	0.04(0.02)	912.5			1825
		1850	0.04(0.02)	925.0			1850
		1875	0.04(0.02)	937.5			1875
41	34.5	1900	0.04(0.02)	950.0	495.1 (49.0)		1900
		1925	0.04(0.02)	962.5			1925
		1950	0.04(0.02)	975.0			1950
		1975	0.03(0.02)	987.5			1975
		2000	0.03(0.02)	1000.0			2000
		2025	0.03(0.02)	1012.5			2025
		2050	0.03(0.02)	1025.0			2050
		2075	0.03(0.02)	1037.5			2075
		2100	0.03(0.02)	1050.0			2100
		2125	0.03(0.02)	1062.5			2125
43	36.5	2150	0.02(0.02)	1075.0	518.1 (51.0)		2150
		2175	0.02(0.02)	1087.5			2175
		2200	0.02(0.02)	1100.0			2200
		2225	0.02(0.02)	1112.5			2225
		2250	0.02(0.02)	1125.0			2250
		2275	0.02(0.02)	1137.5			2275
		2300	0.02(0.02)	1150.0			2300
		2325	0.02(0.02)	1162.5			2325
		2350	0.02(0.02)	1175.0			2350
		2375	0.02(0.02)	1187.5			2375
45	38.5	2400	0.02(0.02)	1200.0	541.1 (54.0)		2400
		2425	0.02(0.02)	1212.5			2425
		2450	0.02(0.02)	1225.0			2450
		2475	0.02(0.02)	1237.5			2475
		2500	0.02(0.02)	1250.0			2500
		2525	0.02(0.02)	1262.5			2525
		2550	0.02(0.02)	1275.0			2550
		2575	0.02(0.02)	1287.5			2575
		2600	0.02(0.02)	1300.0			2600
		2625	0.02(0.02)	1312.5			2625
47	40.5	2650	0.02(0.02)	1325.0	564.1 (56.0)		2650
		2675	0.02(0.02)	1337.5			2675
		2700	0.02(0.02)	1350.0			2700
		2725	0.02(0.02)	1362.5			2725
		2750	0.02(0.02)	1375.0			2750
		2775	0.02(0.02)	1387.5			2775
		2800	0.02(0.02)	1400.0			2800
		2825	0.02(0.02)	1412.5			2825
		2850	0.02(0.02)	1425.0			2850
		2875	0.02(0.02)	1437.5			2875
49	42.5	2900	0.02(0.02)	1450.0	587.1 (58.0)		2900
		2925	0.02(0.02)	1462.5			2925
		2950	0.02(0.02)	1475.0			2950
		2975	0.02(0.02)	1487.5			2975
		3000	0.02(0.02)	1500.0			3000
		3025	0.02(0.02)	1512.5			3025
		3050	0.02(0.02)	1525.0			3050
		3075	0.02(0.02)	1537.5			3075
		3100	0.02(0.02)	1550.0			3100
		3125	0.02(0.02)	1562.5			3125
51	44.5	3150	0.02(0.02)	1575.0	610.1 (61.0)		3150
		3175	0.02(0.02)	1587.5			3175
		3200	0.02(0.02)	1600.0			3200
		3225	0.02(0.02)	1612.5			3225
		3250	0.02(0.02)	1625.0			3250
		3275	0.02(0.02)	1637.5			3275
		3300	0.02(0.02)	1650.0			3300
		3325	0.02(0.02)	1662.5			3325
		3350	0.02(0.02)	1675.0			3350
		3375	0.02(0.02)	1687.5			3375
53	46.5	3400	0.02(0.02)	1700.0	633.1 (63.0)		3400
		3425	0.02(0.02)	1712.5			3425
		3450	0.02(0.02)	1725.0			3450
		3475	0.02(0.02)	1737.5			3475
		3500	0.02(0.02)	1750.0			3500
		3525	0.02(0.02)	1762.5			3525
		3550	0.02(0.02)	1775.0			3550
		3575	0.02(0.02)	1787.5			3575
		3600	0.02(0.02)	1800.0			3600
		3625	0.02(0.02)	1812.5			3625
55	48.5	3650	0.02(0.02)	1825.0	656.1 (65.0)		3650
		3675	0.02(0.02)	1837.5			3675
		3700	0.02(0.02)	1850.0			3700
		3725	0.02(0.02)	1862.5			3725
		3750	0.02(0.02)	1875.0			3750
		3775	0.02(0.02)	1887.5			3775
		3800	0.02(0.02)	1900.0			3800
		3825	0.02(0.02)	1912.5			3825
		3850	0.02(0.02)	1925.0			3850
		3875	0.02(0.02)	1937.5			3875
57	50.5	3900	0.02(0.02)	1950.0	679.1 (67.0)		3900
		3925	0.02(0.02)	1962.5			3925
		3950	0.02(0.02)	1975.0			3950
		3975	0.02(0.02)	1987.5			3975
		4000	0.02(0.02)	2000.0			4000
		4025	0.02(0.02)	2012.5			4025
		4050	0.02(0.02)	2025.0			4050
		4075					

Coil Spring
For Light Load SWF



D	d	L	Spring Constant N/mm(kgf/mm)	F=Lx40% Fmm Load N(kgf)	F=Lx45% Fmm Load N(kgf)	F=Lx50% Fmm Load N(kgf)	Part Number	Unit Price
							TypeD-L	
6	3	15	7.8(0.80)	6.0	6.8	7.5	SWF6-	15
		20	5.9(0.60)	8.0	9.0	10.0		20
		25	4.7(0.48)	10.0	11.3	12.5		25
		30	3.9(0.40)	12.0	13.5	15.0		30
		35	3.4(0.34)	14.0	15.8	17.5		35
		40	2.9(0.30)	16.0	18.0	20.0		40
8	4	10	15.7(1.60)	4.0	4.5	5.0	SWF8-	10
		15	10.5(1.07)	6.0	6.8	7.5		15
		20	7.8(0.80)	8.0	9.0	10.0		20
		25	6.3(0.64)	10.0	11.2	12.5		25
		30	5.2(0.53)	12.0	13.5	15.0		30
		35	4.5(0.46)	14.0	15.7	17.5		35
		40	3.9(0.40)	16.0	18.0	20.0		40
		45	3.5(0.36)	18.0	20.2	22.5		45
		50	3.1(0.32)	20.0	22.5	25.0		50
		55	2.9(0.29)	22.0	24.7	27.5		55
		60	2.6(0.27)	24.0	27.0	30.0		60
		65	2.4(0.25)	26.0	29.3	32.5		65
		70	2.2(0.23)	28.0	31.5	35.0		70
		75	2.1(0.21)	30.0	33.8	37.5		75
10	5	80	2.0(0.20)	32.0	36.0	40.0	SWF10-	80
		10	19.6(2.00)	4.0	4.5	5.0		10
		15	13.1(1.33)	6.0	6.8	7.5		15
		20	9.8(1.00)	8.0	9.0	10.0		20
		25	7.8(0.80)	10.0	11.2	12.5		25
		30	6.5(0.67)	12.0	13.5	15.0		30
		35	5.9(0.57)	14.0	15.7	17.5		35
		40	4.9(0.50)	16.0	18.0	20.0		40
		45	4.4(0.44)	18.0	20.2	22.5		45
		50	3.9(0.40)	20.0	22.5	25.0		50
		55	3.6(0.36)	22.0	24.7	27.5		55
		60	3.3(0.33)	24.0	27.0	30.0		60
		65	3.0(0.31)	26.0	29.2	32.5		65
		70	2.8(0.29)	28.0	31.5	35.0		70
12	6	75	2.6(0.27)	30.0	33.7	37.5	SWF12-	75
		80	2.5(0.25)	32.0	36.0	40.0		80
		90	2.2(0.22)	36.0	40.5	45.0		90
		15	18.3(1.87)	6.0	6.8	7.5		15
		20	13.7(1.40)	8.0	9.0	10.0		20
		25	11.0(1.12)	10.0	11.2	12.5		25
		30	9.2(0.93)	12.0	13.5	15.0		30
		35	7.8(0.80)	14.0	15.7	17.5		35
		40	6.9(0.70)	16.0	18.0	20.0		40
		45	6.1(0.62)	18.0	20.2	22.5		45
		50	5.5(0.56)	20.0	22.5	25.0		50
		55	5.0(0.51)	22.0	24.7	27.5		55
		60	4.6(0.47)	24.0	27.0	30.0		60
		65	4.2(0.43)	26.0	29.2	32.5		65
14	7	70	3.9(0.40)	28.0	31.5	35.0	SWF14-	70
		75	3.7(0.37)	30.0	33.7	37.5		75
		80	3.4(0.35)	32.0	36.0	40.0		80
		90	3.1(0.31)	36.0	40.5	45.0		90
		20	17.7(1.80)	8.0	9.0	10.0		20
		25	14.1(1.44)	10.0	11.2	12.5		25
		30	11.8(1.20)	12.0	13.5	15.0		30
		35	10.1(1.03)	14.0	15.7	17.5		35
		40	8.8(0.90)	16.0	18.0	20.0		40
		45	7.8(0.80)	18.0	20.2	22.5		45
		50	7.1(0.72)	20.0	22.5	25.0		50
		55	6.4(0.65)	22.0	24.7	27.5		55
		60	5.9(0.60)	24.0	27.0	30.0		60
		65	5.4(0.55)	26.0	29.2	32.5		65
16	8	70	5.0(0.51)	28.0	31.5	35.0	SWF16-	70
		75	4.7(0.48)	30.0	33.7	37.5		75
		80	4.4(0.45)	32.0	36.0	40.0		80
		90	3.9(0.40)	36.0	40.5	45.0		90
		100	3.5(0.36)	40.0	45.0	50.0		100
		Usage Count	1 Million Times	500,000 Times	300,000 Times			

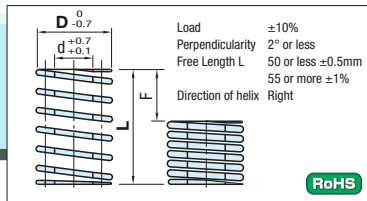
D	d	L	Spring Constant N/mm(kgf/mm)	F=Lx40% Fmm Load N(kgf)	F=Lx45% Fmm Load N(kgf)	F=Lx50% Fmm Load N(kgf)	Part Number	Unit Price
							TypeD-L	
16	8	20	20.6(2.10)	8.0	9.0	10.0	SWF16-	20
		25	16.5(1.68)	10.0	11.2	12.5		25
		30	13.7(1.40)	12.0	13.5	15.0		30
		35	11.8(1.20)	14.0	15.7	17.5		35
		40	10.3(1.05)	16.0	18.0	20.0		40
		45	9.2(0.93)	18.0	20.2	22.5		45
		50	8.2(0.84)	20.0	22.5	25.0		50
		55	7.5(0.76)	22.0	24.7	27.5		55
		60	6.9(0.70)	24.0	27.0	30.0		60
		65	6.3(0.65)	26.0	29.2	32.5		65
		70	5.9(0.60)	28.0	31.5	35.0		70
		75	5.5(0.56)	30.0	33.7	37.5		75
		80	5.1(0.53)	32.0	36.0	40.0		80
		90	4.6(0.47)	36.0	40.5	45.0		90
18	9	100	4.1(0.42)	40.0	45.0	50.0	SWF18-	100
		125	3.3(0.34)	50.0	56.3	62.5		125
		20	25.5(2.60)	8.0	9.0	10.0		20
		25	20.4(2.08)	10.0	11.2	12.5		25
		30	17.0(1.73)	12.0	13.5	15.0		30
		35	14.6(1.49)	14.0	15.7	17.5		35
		40	12.7(1.30)	16.0	18.0	20.0		40
		45	11.3(1.16)	18.0	20.2	22.5		45
		50	10.2(1.04)	20.0	22.5	25.0		50
		55	9.3(0.95)	22.0	24.7	27.5		55
		60	8.5(0.87)	24.0	27.0	30.0		60
		65	7.8(0.80)	26.0	29.2	32.5		65
		70	7.3(0.74)	28.0	31.5	35.0		70
		75	6.8(0.69)	30.0	33.7	37.5		75
20	11	80	6.4(0.65)	32.0	36.0	40.0	SWF20-	80
		90	5.7(0.58)	36.0	40.5	45.0		90
		100	5.1(0.52)	40.0	45.0	50.0		100
		125	4.1(0.42)	50.0	56.3	62.5		125
		20	31.4(3.20)	8.0	9.0	10.0		20
		25	25.1(2.56)	10.0	11.2	12.5		25
		30	20.9(2.13)	12.0	13.5	15.0		30
		35	17.9(1.83)	14.0	15.7	17.5		35
		40	15.7(1.60)	16.0	18.0	20.0		40
		45	13.9(1.42)	18.0	20.2	22.5		45
		50	12.6(1.28)	20.0	22.5	25.0		50
		55	11.4(1.16)	22.0	24.7	27.5		55
		60	10.5(1.07)	24.0	27.0	30.0		60
		65	9.7(0.98)	26.0	29.2	32.5		65
22	11	70	9.0(0.91)	28.0	31.5	35.0	SWF22-	70
		75	8.4(0.85)	30.0	33.7	37.5		75
		80	7.8(0.80)	32.0	36.0	40.0		80
		90	7.0(0.71)	36.0	40.5	45.0		90
		100	6.3(0.64)	40.0	45.0	50.0		100
		125	5.0(0.51)	50.0	56.2	62.5		125
		150	4.2(0.43)	60.0	67.5	75.0		150
		25	31.4(3.20)	10.0	11.2	12.5		25
		30	26.2(2.67)	12.0	13.5	15.0		30
		35	22.4(2.29)	14.0	15.7	17.5		35
		40	19.6(2.00)	16.0	18.0	20.0		40
		45	17.4(1.78)	18.0	20.2	22.5		45
		50	15.7(1.60)	20.0	22.5	25.0		50
		55	14.3(1.45)	22.0	24.7	27.5		55
24	11	60	13.1(1.33)	24.0	27.0	30.0	SWF24-	60
		65	12.1(1.23)	26.0	29.2	32.5		65
		70	11.2(1.14)	28.0	31.5	35.0		70
		75	10.5(1.07)	30.0	33.7	37.5		75
		80	9.8(1.00)	32.0	36.0	40.0		80
		90	8.7(0.89)	36.0	40.5	45.0		90
		100	7.8(0.80)	40.0	45.0	50.0		100
		125	6.3(0.64)	50.0	56.2	62.5		125
		150	5.2(0.53)	60.0	67.5	75.0		150
		Usage Count	1 Million Times	500,000 Times	300,000 Times			

Ordering Example
Part Number
SWF10-30

D	d	L	Spring	F=Lx40%		F=Lx45%		F=Lx50%		Part Number	Unit Price					
			Constant N/mm(kgf/mm)	Fmm	Load N(kgf)	Fmm	Load N(kgf)	Fmm	Load N(kgf)	TypeD-L						
25	13.5	25	39.2(4.00)	10.0		11.2		12.5		SWF25-	25					
		30	32.7(3.33)	12.0		13.5		15.0			30					
		35	28.0(2.86)	14.0		15.7		17.5			35					
		40	24.5(2.50)	16.0		18.0		20.0			40					
		45	21.8(2.22)	18.0		20.2		22.5			45					
		50	19.6(2.00)	20.0		22.5		25.0			50					
		55	17.8(1.82)	22.0		24.7		27.5			55					
		60	16.3(1.67)	24.0		27.0		30.0			60					
		65	15.1(1.54)	26.0	392	29.2	441	32.5	490		65					
		70	14.0(1.43)	28.0	{40}	31.5	{45}	35.0	{50}		70					
		75	13.1(1.33)	30.0		33.7		37.5			75					
		80	12.3(1.25)	32.0		36.0		40.0			80					
		90	10.9(1.11)	36.0		40.5		45.0			90					
		100	9.8(1.00)	40.0		45.0		50.0			100					
		125	7.8(0.80)	50.0		56.2		62.5			125					
		150	6.5(0.67)	60.0		67.5		75.0			150					
175	5.6(0.57)	70.0		78.7		87.5		175								
200	4.9(0.50)	80.0		90.0		100.0		200								
27	13.5	25	47.1(4.80)	10.0		11.2		12.5		SWF27-	25					
		30	39.2(4.00)	12.0		13.5		15.0			30					
		35	33.6(3.43)	14.0		15.7		17.5			35					
		40	29.4(3.00)	16.0		18.0		20.0			40					
		45	26.2(2.67)	18.0		20.2		22.5			45					
		50	23.5(2.40)	20.0		22.5		25.0			50					
		55	21.4(2.18)	22.0		24.7		27.5			55					
		60	19.6(2.00)	24.0		27.0		30.0			60					
		65	18.1(1.85)	26.0	471	29.2	530	32.5	588		65					
		70	16.8(1.71)	28.0	{48}	31.5	{54}	35.0	{60}		70					
		75	15.7(1.60)	30.0		33.7		37.5			75					
		80	14.7(1.50)	32.0		36.0		40.0			80					
		90	13.1(1.33)	36.0		40.5		45.0			90					
		100	11.8(1.20)	40.0		45.0		50.0			100					
		125	9.4(0.96)	50.0		56.2		62.5			125					
		150	7.8(0.80)	60.0		67.5		75.0			150					
175	6.7(0.69)	70.0		78.7		87.5		175								
200	5.9(0.60)	80.0		90.0		100.0		200								
30	16	25	56.5(5.76)	10.0		11.2		12.5		SWF30-	25					
		30	47.1(4.80)	12.0		13.5		15.0			30					
		35	40.3(4.11)	14.0		15.7		17.5			35					
		40	35.3(3.60)	16.0		18.0		20.0			40					
		45	31.4(3.20)	18.0		20.2		22.5			45					
		50	28.2(2.88)	20.0		22.5		25.0			50					
		55	25.7(2.62)	22.0		24.7		27.5			55					
		60	23.5(2.40)	24.0		27.0		30.0			60					
		65	21.7(2.22)	26.0	565	29.2	630	32.5	706		65					
		70	20.2(2.06)	28.0	{58}	31.5	{65}	35.0	{72}		70					
		75	18.8(1.92)	30.0		33.7		37.5			75					
		80	17.7(1.80)	32.0		36.0		40.0			80					
		90	15.7(1.60)	36.0		40.5		45.0			90					
		100	14.1(1.44)	40.0		45.0		50.0			100					
		125	11.3(1.15)	50.0		56.2		62.5			125					
		150	9.4(0.96)	60.0		67.5		75.0			150					
175	8.1(0.82)	70.0		78.7		87.5		175								
200	7.1(0.72)	80.0		90.0		100.0		200								
35	19	40	48.0(4.89)	16.0		18.0		20.0		SWF35-	40					
		45	42.7(4.35)	18.0		20.2		22.5			45					
		50	38.4(3.92)	20.0		22.5		25.0			50					
		55	34.9(3.56)	22.0		24.7		27.5			55					
		60	32.0(3.26)	24.0		27.0		30.0			60					
		65	29.5(3.01)	26.0		29.2		32.5			65					
		70	27.4(2.80)	28.0		31.5		35.0			70					
		75	25.6(2.61)	30.0	768	33.7	864	37.5	960		75					
		80	24.0(2.45)	32.0	{78}	36.0	{88}	40.0			80					
		90	21.3(2.18)	36.0		40.5		45.0			90					
		100	19.2(1.96)	40.0		45.0		50.0			100					
		125	15.4(1.57)	50.0		56.2		62.5			125					
		150	12.8(1.31)	60.0		67.5		75.0			150					
		175	11.0(1.12)	70.0		78.7		87.5			175					
		200	9.6(0.98)	80.0		90.0		100.0			200					
		Usage Count				1 Million Times					500,000 Times				300,000 Times	

Coil Spring

Light Load SWL

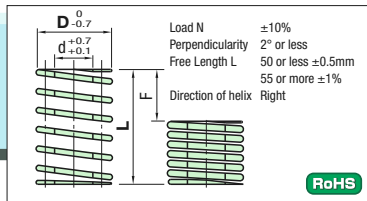


RoHS

D	d	L	Spring Constant N/mm(kgf/mm)	F=Lx32% Fmm Load N(kgf)	F=Lx36% Fmm Load N(kgf)	F=Lx40% Fmm Load N(kgf)	Part Number Type D-L	Unit Price
6	3	15	13.1(1.33)	4.8	5.4	6.0	SWL 6-	15
		20	9.8(1.00)	6.4	7.2	8.0		20
		25	7.8(0.80)	8.0	9.0	10.0		25
		30	6.5(0.67)	9.6	10.8	12.0		30
		35	5.6(0.57)	11.2	12.6	14.0		35
		40	4.9(0.50)	12.8	14.4	16.0		40
8	4	10	24.5(2.50)	3.2	3.6	4.0	SWL 8-	10
		15	16.3(1.67)	4.8	5.4	6.0		15
		20	12.3(1.25)	6.4	7.2	8.0		20
		25	9.8(1.00)	8.0	9.0	10.0		25
		30	8.2(0.83)	9.6	10.8	12.0		30
		35	7.0(0.71)	11.2	12.6	14.0		35
		40	6.1(0.63)	12.8	14.4	16.0		40
		45	5.4(0.56)	14.4	16.2	18.0		45
		50	4.9(0.50)	16.0	18.0	20.0		50
		55	4.5(0.45)	17.6	19.8	22.0		55
		60	4.1(0.42)	19.2	21.6	24.0		60
		65	3.8(0.38)	20.8	23.4	26.0		65
		70	3.5(0.36)	22.4	25.2	28.0		70
		75	3.3(0.33)	24.0	27.0	30.0		75
		80	3.1(0.31)	25.6	28.8	32.0		80
10	5	10	34.3(3.50)	3.2	3.6	4.0	SWL 10-	10
		15	22.9(2.33)	4.8	5.4	6.0		15
		20	17.2(1.75)	6.4	7.2	8.0		20
		25	13.7(1.40)	8.0	9.0	10.0		25
		30	11.4(1.17)	9.6	10.8	12.0		30
		35	9.8(1.00)	11.2	12.6	14.0		35
		40	8.6(0.88)	12.8	14.4	16.0		40
		45	7.6(0.78)	14.4	16.2	18.0		45
		50	6.9(0.70)	16.0	18.0	20.0		50
		55	6.2(0.64)	17.6	19.8	22.0		55
		60	5.7(0.58)	19.2	21.6	24.0		60
		65	5.3(0.54)	20.8	23.4	26.0		65
		70	4.9(0.50)	22.4	25.2	28.0		70
		75	4.6(0.47)	24.0	27.0	30.0		75
		80	4.3(0.44)	25.6	28.8	32.0		80
90	3.8(0.39)	28.8	32.4	36.0		90		
12	6	15	34.3(3.50)	4.8	5.4	6.0	SWL 12-	15
		20	25.7(2.63)	6.4	7.2	8.0		20
		25	20.6(2.10)	8.0	9.0	10.0		25
		30	17.2(1.75)	9.6	10.8	12.0		30
		35	14.7(1.50)	11.2	12.6	14.0		35
		40	12.9(1.31)	12.8	14.4	16.0		40
		45	11.4(1.17)	14.4	16.2	18.0		45
		50	10.3(1.05)	16.0	18.0	20.0		50
		55	9.4(0.95)	17.6	19.8	22.0		55
		60	8.6(0.88)	19.2	21.6	24.0		60
		65	7.9(0.81)	20.8	23.4	26.0		65
		70	7.4(0.75)	22.4	25.2	28.0		70
		75	6.9(0.70)	24.0	27.0	30.0		75
		80	6.4(0.66)	25.6	28.8	32.0		80
		90	5.7(0.58)	28.8	32.4	36.0		90
14	7	20	34.3(3.50)	6.4	7.2	8.0	SWL 14-	20
		25	27.5(2.80)	8.0	9.0	10.0		25
		30	22.9(2.33)	9.6	10.8	12.0		30
		35	19.6(2.00)	11.2	12.6	14.0		35
		40	17.2(1.75)	12.8	14.4	16.0		40
		45	15.3(1.56)	14.4	16.2	18.0		45
		50	13.7(1.40)	16.0	18.0	20.0		50
		55	12.5(1.27)	17.6	19.8	22.0		55
		60	11.4(1.17)	19.2	21.6	24.0		60
		65	10.6(1.08)	20.8	23.4	26.0		65
		70	9.8(1.00)	22.4	25.2	28.0		70
		75	9.2(0.93)	24.0	27.0	30.0		75
		80	8.6(0.88)	25.6	28.8	32.0		80
		90	7.6(0.78)	28.8	32.4	36.0		90
		100	6.9(0.70)	32.0	36.0	40.0		100
Usage Count				1 Million Times500,000 Times300,000 Times				

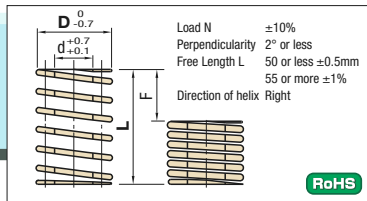
Coil Spring

Heavy Load SWH



Coil Spring

Ultra Heavy Load JIS-SWB



D	d	L	Spring Constant		F=Lx19.2%		F=Lx21.6%		F=Lx24%		Part Number		Unit Price
			N/mm(kgf/mm)	Fmm	Load N(kgf)	Fmm	Load N(kgf)	Fmm	Load N(kgf)	Type D-L			
6	3	15	38.1(3.9)	2.9	110 {11}	3.2	123 {13}	3.6	137 {14}	SWH 6-	15		
		20	28.5(2.9)	3.8		4.3		4.8			20		
		25	22.8(2.3)	4.8		5.4		6.0			25		
		30	19.0(1.9)	5.8		6.5		7.2			30		
		35	16.3(1.7)	6.7		7.6		8.4			35		
		40	14.3(1.5)	7.7		8.6		9.6			40		
		45	12.7(1.3)	8.6		9.7		10.8			45		
		50	11.4(1.2)	9.6		10.8		12.0			50		
		55	10.4(1.1)	10.6		11.9		13.2			55		
60	9.5(1.0)	11.5	13.0	14.4	60								
8	4	10	85.8(8.8)	1.9	165 {17}	2.2	185 {19}	2.4	206 {21}	SWH 8-	10		
		15	57.2(5.8)	2.9		3.2		3.6			15		
		20	42.9(4.4)	3.8		4.3		4.8			20		
		25	34.3(3.5)	4.8		5.4		6.0			25		
		30	28.6(2.9)	5.8		6.5		7.2			30		
		35	24.5(2.5)	6.7		7.5		8.4			35		
		40	21.5(2.2)	7.7		8.6		9.6			40		
		45	19.1(1.9)	8.6		9.7		10.8			45		
		50	17.2(1.8)	9.6		10.8		12.0			50		
55	15.6(1.6)	10.6	11.8	13.2	55								
60	14.3(1.5)	11.5	13.0	14.4	60								
65	13.2(1.3)	12.5	14.0	15.6	65								
70	12.3(1.3)	13.4	15.1	16.8	70								
75	11.4(1.2)	14.4	16.2	18.0	75								
80	10.7(1.1)	15.4	17.3	19.2	80								
10	5	10	123(12.5)	1.9	235 {24}	2.2	265 {27}	2.4	294 {30}	SWH 10-	10		
		15	81.7(8.3)	2.9		3.2		3.6			15		
		20	61.3(6.3)	3.8		4.3		4.8			20		
		25	49.0(5.0)	4.8		5.4		6.0			25		
		30	40.8(4.2)	5.8		6.5		7.2			30		
		35	35.0(3.6)	6.7		7.5		8.4			35		
		40	30.6(3.1)	7.7		8.6		9.6			40		
		45	27.2(2.8)	8.6		9.7		10.8			45		
		50	24.5(2.5)	9.6		10.8		12.0			50		
55	22.3(2.3)	10.6	11.8	13.2	55								
60	20.4(2.1)	11.5	13.0	14.4	60								
65	18.8(1.9)	12.5	14.0	15.6	65								
70	17.5(1.8)	13.4	15.1	16.8	70								
75	16.3(1.7)	14.4	16.2	18.0	75								
80	15.3(1.6)	15.4	17.3	19.2	80								
90	13.6(1.4)	17.3	19.4	21.6	90								
12	6	15	117(11.9)	2.9	337 {34}	3.2	379 {38}	3.6	421 {43}	SWH 12-	15		
		20	87.7(8.9)	3.8		4.3		4.8			20		
		25	70.2(7.2)	4.8		5.4		6.0			25		
		30	58.5(6.0)	5.8		6.5		7.2			30		
		35	50.1(5.1)	6.7		7.5		8.4			35		
		40	43.9(4.5)	7.7		8.6		9.6			40		
		45	39.0(4.0)	8.6		9.7		10.8			45		
		50	35.1(3.6)	9.6		10.8		12.0			50		
		55	31.9(3.3)	10.6		11.8		13.2			55		
60	29.2(3.0)	11.5	13.0	14.4	60								
65	27.0(2.8)	12.5	14.0	15.6	65								
70	25.1(2.6)	13.4	15.1	16.8	70								
75	23.4(2.4)	14.4	16.2	18.0	75								
80	21.9(2.2)	15.4	17.3	19.2	80								
90	19.5(2.0)	17.3	19.4	21.6	90								
14	7	20	120(12.3)	3.8	462 {47}	4.3	520 {53}	4.8	578 {59}	SWH 14-	20		
		25	96.3(9.8)	4.8		5.4		6.0			25		
		30	80.3(8.2)	5.8		6.5		7.2			30		
		35	68.8(7.0)	6.7		7.5		8.4			35		
		40	60.2(6.1)	7.7		8.6		9.6			40		
		45	53.5(5.5)	8.6		9.7		10.8			45		
		50	48.2(4.9)	9.6		10.8		12.0			50		
		55	43.8(4.5)	10.6		11.8		13.2			55		
		60	40.1(4.1)	11.5		13.0		14.4			60		
65	37.1(3.8)	12.5	14.0	15.6	65								
70	34.4(3.5)	13.4	15.1	16.8	70								
75	32.1(3.3)	14.4	16.2	18.0	75								
80	30.1(3.1)	15.4	17.3	19.2	80								
90	26.8(2.7)	17.3	19.4	21.6	90								
100	24.1(2.5)	19.2	21.6	24.0	100								
Usage Count			1 Million Times500,000 Times300,000 Times										



Ordering Example
Part Number
SWH20-30
SWB22-60

Material: Oil tempered wires for springs

D	d	L	Spring Constant N/mm(kgf/mm)	F=Lx16% Fmm Load N(kgf)	F=Lx18% Fmm Load N(kgf)	F=Lx20% Fmm Load N(kgf)	Part Number Type D-L	Unit Price
6	3	15	59.0(6.0)	2.4	2.7	3.0	SWB 6- 142 {14} 159 {16} 177 {18}	15
		20	44.3(4.5)	3.2	3.6	4.0		20
		25	35.4(3.6)	4.0	4.5	5.0		25