

COIL SPRINGS

COIL SPRINGS



Product name	ROUND WIRE COIL SPRINGS	ROUND WIRE COIL SPRINGS - INNER DIAMETER STANDARD TYPE -	COIL SPRINGS			
Catalog No.	WY-WR-WF-WL-WT-WM-WH-WB	NWL-NWM-WP	SWY	SWU	SWR	SWS
Page	1398 ~ 1405	1406	1407	1408	1409	1411

COIL SPRINGS									
SWC	SWF	SWL	SWM	SWH	SWB	SWG	SWZ	SWV	SWX
1413	1415	1417	1419	1421	1423	1425	1427	1429	1430

SPRING GUIDE UNITS	WASHERS FOR COIL SPRINGS	SPRING UNIT FLANGES	SPRING GUIDE PINS	SPRING GUIDE RETAINERS
CUK	SSWA-SSWB-SSWC	WUNT	SGA	SGC
1433	1435	1436	1437	1438
				SGCR 1439

Features	page	Type		Size Outer dia.		Full length		Maximum deflection	Load N(kgf)		
		Catalog No.	Color	min.	max.	min.	max.		min.	max.	
<p>○The spring constant is fixed for each diameter. (Load capacity varies depending on the full length.)</p>	P.1398	WY	—	φ3	φ16	5	70	75% (10 million shots)	0.38 {0.04}	10.3 {1.05}	
	P.1399	WR	—	φ3	φ27	5	90	60% (10 million shots)	0.9 {0.09}	23.5 {2.4}	
	P.1400	WF	—	φ3	φ27	5	90	45% (10 million shots)	1.1 {0.11}	35.3 {3.6}	
	P.1401	WL	—	φ2	φ27	5	100	40% (10 million shots)	0.98 {0.1}	117.7 {12.0}	
	P.1402	WT	—	φ3	φ27	5	80	40% (10 million shots)	2.9 {0.3}	125.5 {12.8}	
	P.1403	WM	—	φ3	φ27	5	100	35% (10 million shots)	3.4 {0.4}	171.6 {17.5}	
	P.1404	WH	—	φ4	φ27	5	100	30% (10 million shots)	4.9 {0.5}	441.3 {45.0}	
	P.1405	WB	—	φ3	φ27	5	100	25% (10 million shots)	4.9 {0.5}	735.5 {75.0}	
	P.1406	NWL (Inner diameter reference)	—	—	φ5.5 (Inner dia.)	φ16.6 (Inner dia.)	30	60	40% (10 million shots)	13.7 {1.4}	27.5 {2.8}
	P.1406	NWM (Inner diameter reference)	—	—	φ5.5 (Inner dia.)	φ16.6 (Inner dia.)	30	60	32% (10 million shots)	20.6 {2.1}	34.3 {3.5}
P.1406	WP (Long type)	—	—	φ11.5	φ17	100	500	70% (10 million shots)	21.3 {2.2}	34.3 {3.5}	

●Operating temperatures

The load capacities and other data listed in the Catalog are those measured at normal temperatures (40°C or below). If the service environment temperature exceeds the normal temperature range, the load capacity and durability count may decrease, although this varies depending on a variety of conditions.
The maximum operating environment temperature is 80°C. Although the heat resistance temperature of the spring wire material is higher than the operating temperature (120°C for round wires, 200°C for shaped wires), a significant diminishment in function is expected if the spring is used at a temperature above the maximum service environment temperature.

●Maximum allowable deflection

Do not use the springs at deflections exceeding the maximum allowable deflection. If used at higher deflections, the spring load capacity and durability will diminish, and in the worst case the spring may break.
○ If a round wire coil spring is used even once at a stroke exceeding the maximum allowable deflection, the L dimension will be shortened.

Features	page	Type		Size Outer dia. (inner dia.)		Full length		Maximum deflection	Load N(kgf)	
		Catalog No.	Color	min.	max.	min.	max.		min.	max.
<p>○Load capacity is fixed for each diameter.</p>	P.1407	SWY	Pastel green	φ11	φ42	20	300	65% (10 million shots)	29.4 {3.0}	392.3 {40.0}
	P.1408	SWU	Light blue	φ10.5	φ43	15	300	70% (3 million shots)	31.4 {3.2}	425.6 {43.4}
	P.1409	SWR	Ivory	φ10.5	φ50	15	400	50% (10 million shots)	68.6 {7.0}	588.4 {60.0}
	P.1411	SWS	Orange	φ10.5	φ52	20	300	65% (3 million shots)	73.9 {7.5}	637.4 {65.0}
	P.1413	SWC	Purple	φ6 (φ3)	φ30 (φ20)	15	200	40% (10 million shots)	78.5 {8.0}	1323.9 {135.0}
	P.1415	SWF	Yellow	φ6 (φ3)	φ70 (φ38.5)	10	500	55% (3 million shots)	87.2 {8.8}	1456.3 {148.5}
	P.1417	SWL	Blue	φ6 (φ3)	φ70 (φ38.5)	10	350	40% (10 million shots)	87.2 {8.9}	1569.0 {160.0}
	P.1419	SWM	Red	φ6 (φ3)	φ70 (φ38.5)	10	350	45% (3 million shots)	97.1 {9.9}	1765.2 {180.0}
	P.1421	SWH	Green	φ6 (φ3)	φ70 (φ38.5)	10	350	50% (10 million shots)	27 {2.8}	392 {40.0}
	P.1423	SWB	Brown	φ6 (φ3)	φ70 (φ38.5)	10	350	60% (3 million shots)	32 {3.3}	471 {48.0}
P.1425	SWG	Black	φ10 (φ5)	φ50 (φ25)	15	200	40% (10 million shots)	47 {4.8}	3136 {320}	
P.1427	SWZ	Gold	φ10 (φ5)	φ50 (φ25)	25	200	50% (10 million shots)	59 {6.0}	3920 {400}	
P.1429	SWV	Wine red	φ10 (φ5)	φ50 (φ25)	30	200	32% (3 million shots)	63 {6.4}	4782 {488}	
P.1430	SWX	(Not coated)	φ20 (φ9.5)	φ40 (φ20.5)	25	100	25.6% (10 million shots)	78 {8.0}	5978 {610}	
							32% (3 million shots)	79 {8.0}	6664 {680}	
							32% (3 million shots)	98 {10}	8330 {850}	
							19.2% (10 million shots)	110 {11}	10046 {1024}	
							24% (3 million shots)	137 {14}	12557 {1280}	
							16% (10 million shots)	142 {14}	13655 {1392}	
							20% (3 million shots)	177 {18}	17069 {1740}	
							16% (10 million shots)	392 {40}	9807 {1000}	
							20% (3 million shots)	490 {50}	12258 {1250}	
							10.5% (10 million shots)	416 {42}	12959 {1321}	
							13% (3 million shots)	515 {53}	16045 {1636}	
							10.5% (10 million shots)	644 {66}	14904 {1528}	
							13% (3 million shots)	797 {81}	18452 {1882}	
							10% (100 million shots)	1275 {130}	5198 {530}	

●Coating of shaped wire coil springs

MISUMI shaped wire coil springs are coated for identification and to prevent corrosion. (SWX is not coated.)

●Spring load calculation method

Load = Spring constant x Deflection
 $N = N/mm \times Fmm$ (SI unit)
 $kgf = kgf/mm \times Fmm$
 $(kgf = N \times 0.101972)$

Instructions and precautions for the use of coil springs

1 Always use a spring guide.

If used without a spring guide, problems such as buckling or bending of the spring body may occur, resulting in concentrated high stress on the inside of the bend and then leading to breakage. Be sure to use a spring guide, such as a shaft or outer diameter guide.

※ In general the best results are obtained by inserting a shaft all the way through the coil spring from top to bottom to serve as an inner diameter guide.

2 Clearance between spring inner diameter and shaft

The shaft diameter should be set approximately 1.0mm smaller than the inner diameter of the coil spring. If the clearance with the shaft is too small, the spring inner diameter will become worn by the shaft, leading to breakage occurring at the worn points. If the clearance is too large, buckling or other problems may occur. If the spring has a long free length (Free length ÷ Outer dia. = 4 or more), add a step to the shaft as shown on the left side of Figure 1 in order to prevent inner diameter contact when the spring body is bent.

3 Clearance between spring outer diameter and counterbore hole

The counterbore hole diameter should be set approximately 1.5 mm larger than the coil spring outer diameter. If the clearance with the counterbore hole is too small, the outer diameter becomes restrained by expansion on the outer diameter side when the spring is flexed. The resulting concentration of stress may cause the spring to break. For a spring with a long free length, a counterbore hole shape such as that shown on the right side of Figure 1 is ideal.

4 Avoid short guide lengths and shallow counterbore hole depths.

If the guide is too short, the spring may contact the end of the guide when the spring buckles, and the resulting friction may cause the spring to break. The guide length should be to a minimum of 150% of the initial set height. Also be sure to chamfer the shaft to approximately C3.

5 Do not use in excess of the maximum allowable deflection (the maximum allowable deflection). (Do not use close to the solid height.)

If the spring is used beyond the maximum allowable deflection, high stress in excess of the calculated value occurs in the cross section. This can cause the spring to break. In addition, if the coil spring is used close to its solid height, the active coils will gradually adhere to each other, increasing the spring constant value and causing the load curve to rise as shown in Fig.2. The resulting high stress may cause the spring to break. This also is a cause of strain. Do not use the coil spring in excess of the maximum allowable deflection.

6 Set an initial deflection.

If there is a gap, the spring will move vertically, resulting in an impact force and causing bending of the body or buckling. Setting an initial deflection stabilizes the top and bottom ends of the spring.

7 Do not use when scrap or other foreign substances are caught in the spring.

Foreign substances which get caught between the coils prevent that part of the coil spring from functioning as an active coil, forcing the other coils to deflect as shown in Fig.3. This effectively reduces the number of active coils, increasing the stress on the spring, and eventually causing it to break. Be careful to prevent scrap or other foreign substances from entering the coils.

8 Do not use in locations where the the mounting surfaces are not sufficiently parallel.

If the mounting surfaces are insufficiently parallel, bending of the spring body occurs, resulting in concentrated high stress on the inside of the bend that may cause the spring to break. In addition, if the die is not sufficiently parallel, as shown in Figure 4, the spring may break due to bending or to exceeding the maximum allowable deflection. Ensure that the coil spring's mounting surfaces are as close to perfectly parallel as possible in order to prevent the maximum allowable deflection from being exceeded.

9 Do not use coil springs in series.

If two coil springs are used in series, the springs will bend as shown in Figure 5. In some cases, the spring will ride up on the shaft or counterbore hole, causing breakage by the same mechanism described in 1. Variation in the spring load capacities will also result in the weaker spring being overcome by the stronger spring (Figure 6). This increases the deflection of the weaker spring, resulting in a difference in durability between the springs or else in breakage. In addition, when two springs are used in series, the spring constant of each is reduced by 1/2.

10 Do not use two coil springs in a double-spring arrangement.

The use of two coil springs in a double-spring arrangement, as shown in Figure 7, may result in the inner coils being sandwiched between the outer coils (or vice versa) when the springs buckle. This can cause the coil springs to break for the same reason described in 4.

11 Do not use the coil spring horizontally.

If the spring is used horizontally, the shaft will cause wear of the spring inner diameter, resulting in breakage at the points of wear.

MISUMI endurance test conditions Fig. 1

- 1 Spring guide type
Inside shaft
Shaft diameter: d - 1.0 mm
- 2 Initial deflection
1.0mm
- 3 Amplitude
Amount of deflection at the maximum allowable deflection
- 4 Speed
180spm
※ Durability count may vary depending on the conditions of use.

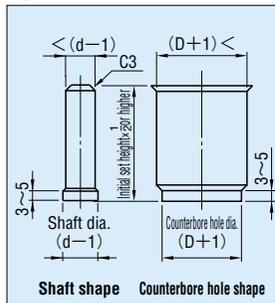


Fig. 2

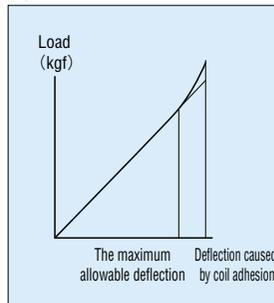


Fig. 3

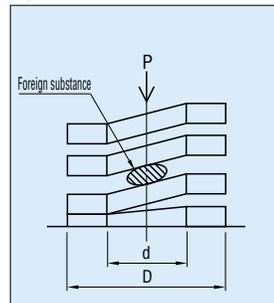


Fig. 4

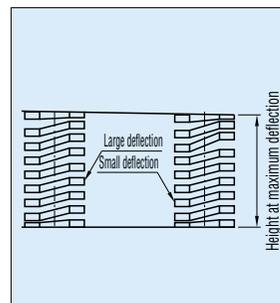


Fig. 5

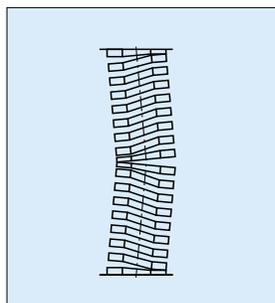


Fig. 6

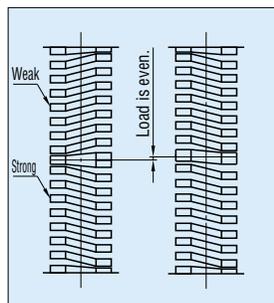
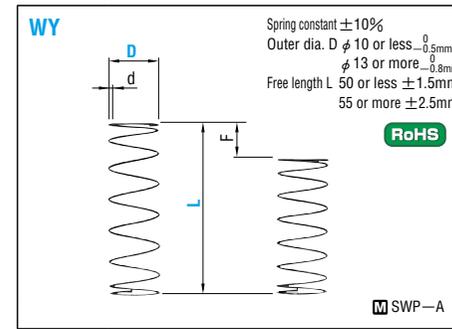
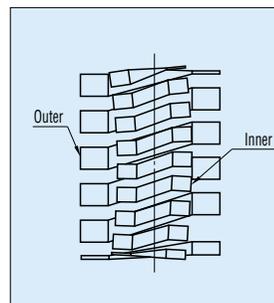


Fig. 7



Spring constant

D	Type	WY	WR	WF	WL	WT	WM	WH	WB
2					0.5 (0.05)				
3						1.5 (0.15)			3.9 (0.4)
4		N/mm 0.1 (kgf/mm) (0.01)					2.0 (0.2)		4.9 (0.5)
5								2.9 (0.3)	
6			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)
8								N/mm 9.8 (kgf/mm) (1.0)	N/mm 19.6 (kgf/mm) (2.0)
10		N/mm 0.2 (kgf/mm) (0.02)							N/mm 29.4 (3.0)
12									
13									
14									
16									
18									
20			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)	
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%

Order Catalog No. WY13-60 Days to Ship Quotation Price Quotation

WY : Fmax. (Maximum allowable deflection) = L×75%

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D-L	Base unit price
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 height	F max.	Load N (kgf) max.	Catalog No. Type D-L	Base unit price
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	
0.5	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	
0.65	9.1	52.5	10.3 {1.05}	70	
0.7	12.6	41.2	8.1 {0.82}	55	
0.7	12.6	45	8.8 {0.9}	60	
0.7	12.6	48.7	9.6 {0.97}	65	
0.7	12.6	52.5	10.3 {1.05}	70	

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D-L	Base unit price
0.6	3.9	15	2.9 {0.3}	WY13-20	
0.65	5.1	18.7	3.7 {0.37}	25	
0.65	5.1	22.5	4.4 {0.45}	30	
0.7	6.7	26.2	5.1 {0.52}	35	
0.75	8.7	30	5.9 {0.6}	40	
0.75	8.7	33.7	6.6 {0.67}	45	
0.8	11.6	37.5	7.4 {0.75}	50	
0.8	11.6	41.2	8.1 {0.82}	55	
0.8	11.6	45	8.8 {0.9}	60	
0.85	15.3	48.7	9.6 {0.97}	65	
0.85	15.3	52.5	10.3 {1.05}	70	
0.65	3.6	15	2.9 {0.3}	WY16-20	
0.7	4.6	18.7	3.7 {0.37}	25	
0.75	5.7	22.5	4.4 {0.45}	30	
0.8	7	26.2	5.1 {0.52}	35	
0.85	9	30	5.9 {0.6}	40	
0.85	9	33.7	6.6 {0.67}	45	
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: Load = Spring constant × Deflection (SI unit) N = N/mm × Fmm kgf = kgf/mm × Fmm (kgf = N × 0.101972)

⊕ Neither end is ground for all WY type springs.
⊕ The solid height values are for reference only. There may be some variation between lots.
⊕ Operation count: 1 million
⊕ Instructions and precautions for the use of coil springs P.1397

ROUND WIRE COIL SPRINGS

—WR (60% DEFLECTION) · WF (45% DEFLECTION)—



Order

Catalog No.
WR13-60



Days to Ship

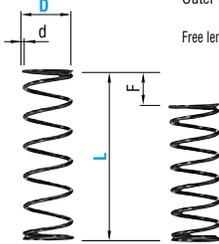
Quotation



Price

Quotation

WR
WF



Spring constant $\pm 10\%$
Outer dia. D $\phi 10$ or less $-0.5mm$
 $\phi 12$ or more $-0.8mm$
Free length L 50 or less $\pm 1.5mm$
55 or more $\pm 2.5mm$

RoHS

SWP-A

Spring constant

D	Type	WY	WR	WF	WL	WT	WM	WH	WB
2	3				0.5 (0.05)				
3	4					1.5 (0.15)			
4	5						2.0 (0.2)		
5	6							2.9 (0.3)	
6	8								3.9 (0.4)
8	10								4.9 (0.5)
10	12								
12	13								
13	14								
14	16								
16	18								
20	22								
22	27								
27									

WR : Fmax. (maximum allowable deflection) = L × 60%

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
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	24	6.2 (0.63)	35	
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	1.6	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	

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.55	3.6	6	1.8 (0.18)	WR10—10	
0.6	4.8	9	2.6 (0.27)	15	
0.65	6.5	12	3.5 (0.36)	20	
0.65	6.5	15	4.4 (0.45)	25	
0.7	8.8	18	5.3 (0.54)	30	
0.7	8.8	21	6.2 (0.63)	35	
0.7	8.8	24	7.1 (0.72)	40	
0.8	16	27	7.9 (0.81)	45	
0.8	16	30	8.8 (0.9)	50	
0.8	16	33	9.7 (0.99)	55	
0.85	21	36	10.6 (1.08)	60	
0.85	21	39	11.5 (1.17)	65	
0.85	21	42	12.4 (1.26)	70	
0.9	28.8	48	14.1 (1.4)	80	
0.6	3.6	6	1.8 (0.18)	WR12—10	
0.65	4.6	9	2.6 (0.27)	15	
0.65	4.6	12	3.5 (0.36)	20	
0.7	6	15	4.4 (0.45)	25	
0.7	6	18	5.3 (0.54)	30	
0.7	6	21	6.2 (0.63)	35	
0.8	10.4	24	7.1 (0.72)	40	
0.8	10.4	27	7.9 (0.81)	45	
0.9	17.1	30	8.8 (0.9)	50	
0.9	17.1	33	9.7 (0.99)	55	
0.9	17.1	36	10.6 (1.08)	60	
0.9	17.1	39	11.5 (1.17)	65	
0.9	17.1	42	12.4 (1.26)	70	
1.0	28	48	14.1 (1.4)	80	
0.6	3.2	6	1.8 (0.18)	WR13—10	
0.7	4.9	9	2.6 (0.27)	15	
0.7	4.9	12	3.5 (0.36)	20	
0.8	8.4	15	4.4 (0.45)	25	
0.8	8.4	18	5.3 (0.54)	30	
0.8	8.4	21	6.2 (0.63)	35	
0.9	13.5	24	7.1 (0.72)	40	
0.9	13.5	27	7.9 (0.81)	45	
0.9	13.5	30	8.8 (0.9)	50	
0.9	13.5	33	9.7 (0.99)	55	
1.0	22	36	10.6 (1.08)	60	
1.0	22	39	11.5 (1.17)	65	
1.0	22	42	12.4 (1.26)	70	
1.0	22	48	14.1 (1.4)	80	
1.0	22	54	15.9 (1.62)	90	
0.7	4.6	9	2.6 (0.27)	WR14—15	
0.75	5.6	12	3.5 (0.36)	20	
0.8	7.2	15	4.4 (0.45)	25	
0.8	7.2	18	5.3 (0.54)	30	
0.8	7.2	21	6.2 (0.63)	35	
0.9	11.3	24	7.1 (0.72)	40	
0.9	11.3	27	7.9 (0.81)	45	
0.9	11.3	30	8.8 (0.9)	50	
1.0	18	33	9.7 (0.99)	55	
1.0	18	36	10.6 (1.08)	60	
1.0	18	39	11.5 (1.17)	65	
1.0	18	42	12.4 (1.26)	70	
1.1	28.6	48	14.1 (1.4)	80	
1.1	28.6	54	15.9 (1.62)	90	

● Load calculation method: Load=Spring constant×Deflection
(SI units) N=M/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

⊕ Neither end is ground for all WR type springs.
⊕ The solid height values are for reference only. There may be some variation between lots.
⊕ Operation count: 1 million
⊕ Instructions and precautions for the use of coil springs P.1397

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
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	

● Load calculation method: Load=Spring constant×Deflection
(SI units) N=M/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

⊕ Neither end is ground for all WR type springs.
⊕ The solid height values are for reference only. There may be some variation between lots.
⊕ Operation count: 1 million
⊕ Instructions and precautions for the use of coil springs P.1397

WF : Fmax. (maximum allowable deflection) = L × 45%

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.26	2	2.25	1.1 (0.11)	WF3—5*	
0.32	5	4.5	2.2 (0.22)		

ROUND WIRE COIL SPRINGS

—WL (40% DEFLECTION) · WT (40% DEFLECTION)—



Order

Catalog No.

WL13-60



Days to Ship

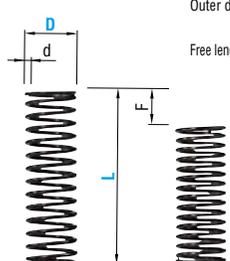
Quotation



Price

Quotation

WL



Spring constant $\pm 10\%$
 Outer dia. D $\phi 10$ or less 0.5mm
 $\phi 12$ or more 0.8mm
 Free length L 50 or less $\pm 1.5\text{mm}$
 55 or more $\pm 2\text{mm}$

RoHS

SWP-A

Spring constant

D	Type	WY	WR	WF	WL	WT	WM	WH	WB
2	3				0.5 (0.05)				
3	4					1.5 (0.15)	2.0 (0.2)		3.9 (0.4)
4	5	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)	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)
5	6								2.9 (0.3)
6	8								N/mm 9.8 (kgf/mm) (1.0)
10	12	N/mm 0.2 (kgf/mm) (0.02)							N/mm 19.6 (kgf/mm) (2.0)
12	13								29.4 (3.0)
14	16								
16	18								
20	22		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 3.9 (kgf/mm) (0.4)	N/mm 4.9 (kgf/mm) (0.5)	N/mm 14.7 (kgf/mm) (1.5)	
22	27								
Fmax.	F=LX75%	F=LX60%	F=LX45%	F=LX40%	F=LX40%	F=LX35%	F=LX30%	F=LX25%	

D12, D14 and D20 are not available for WT type.

WL : Fmax. (maximum allowable deflection) = L X 40%

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.2	1.7	2	0.98 (0.1)	WL2-5*	5*
0.26	5.2	4	2.0 (0.2)	10*	10*
0.26	5.2	6	2.9 (0.3)	15*	15*
0.29	9	8	3.9 (0.4)	20*	20*
0.29	9	10	4.9 (0.5)	25*	25*
0.3	10.8	12	5.9 (0.6)	30*	30*
0.3	2.1	2	2.0 (0.2)	WL3-5*	5*
0.35	3.9	4	3.9 (0.4)	10*	10*
0.4	6.5	6	5.9 (0.6)	15*	15*
0.4	6.5	8	7.8 (0.8)	20*	20*
0.45	13	10	9.8 (1.0)	25*	25*
0.45	13	12	11.8 (1.2)	30*	30*
0.45	13	14	13.7 (1.4)	35*	35*
0.5	21	16	15.7 (1.6)	40*	40*
0.35	2.1	2	2.0 (0.2)	WL4-5*	5*
0.45	5	4	3.9 (0.4)	10*	10*
0.45	5	6	5.9 (0.6)	15*	15*
0.5	9	8	7.8 (0.8)	20*	20*
0.5	9	10	9.8 (1.0)	25*	25*
0.55	13.9	12	11.8 (1.2)	30*	30*
0.55	13.9	14	13.7 (1.4)	35*	35*
0.6	21.6	16	15.7 (1.6)	40*	40*
0.6	21.6	18	17.7 (1.8)	45*	45*
0.6	21.6	20	19.6 (2.0)	50*	50*
0.6	21.6	22	21.6 (2.2)	55*	55*
0.65	33	24	23.5 (2.4)	60*	60*
0.4	2.3	2	2.0 (0.2)	WL5-5*	5*
0.45	3.4	4	3.9 (0.4)	10*	10*
0.5	5	6	5.9 (0.6)	15*	15*
0.55	7.7	8	7.8 (0.8)	20*	20*
0.6	10.8	10	9.8 (1.0)	25*	25*
0.6	10.8	12	11.8 (1.2)	30*	30*
0.65	15.6	14	13.7 (1.4)	35*	35*
0.65	15.6	16	15.7 (1.6)	40*	40*
0.7	20	18	17.7 (1.8)	45*	45*
0.7	20	20	19.6 (2.0)	50*	50*
0.7	23.1	22	21.6 (2.2)	55*	55*
0.75	33	24	23.5 (2.4)	60*	60*
0.75	32.3	26	25.5 (2.6)	65*	65*
0.75	32.3	28	27.5 (2.8)	70*	70*
0.45	2.5	2	2.0 (0.2)	WL6-5*	5*
0.55	4.7	4	3.9 (0.4)	10*	10*
0.55	4.7	6	5.9 (0.6)	15*	15*
0.65	9	8	7.8 (0.8)	20*	20*
0.65	9	10	9.8 (1.0)	25*	25*
0.7	13.7	12	11.8 (1.2)	30*	30*
0.7	13.7	14	13.7 (1.4)	35*	35*
0.7	13.7	16	15.7 (1.6)	40*	40*
0.75	18.9	18	17.7 (1.8)	45*	45*
0.75	18.9	20	19.6 (2.0)	50*	50*
0.75	18.9	22	21.6 (2.2)	55*	55*
0.8	26.4	24	23.5 (2.4)	60*	60*
0.8	26.4	26	25.5 (2.6)	65*	65*
0.85	30.6	28	27.5 (2.8)	70*	70*
0.85	34.9	32	31.4 (3.2)	80*	80*

Load calculation method: Load=Spring constantXDeflection

(SI units) N=N/mmXFmm
 kgf=kgf/mmXFmm
 (kgf=NX0.101972)

- No grinding on either end of WL types marked with *.
- The solid height values are for reference only. There may be some variation between lots.
- Operation count: 1 million
- Instructions and precautions for the use of coil springs P.1397

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.65	4.7	4	3.9 (0.4)	WL8-10	10
0.75	8.5	6	5.9 (0.6)	15	15
0.75	8.5	8	7.8 (0.8)	20	20
0.75	8.5	10	9.8 (1.0)	25	25
0.8	11.2	12	11.8 (1.2)	30	30
0.8	11.2	14	13.7 (1.4)	35	35
0.8	11.2	16	15.7 (1.6)	40	40
0.85	15.3	18	17.7 (1.8)	45	45
0.85	15.3	20	19.6 (2.0)	50	50
0.85	15.3	22	21.6 (2.2)	55	55
0.9	19.4	24	23.5 (2.4)	60	60
0.9	19.4	26	25.5 (2.6)	65	65
1.0	31	28	27.5 (2.8)	70	70
1.0	31	32	31.4 (3.2)	80	80
0.75	5.3	4	3.9 (0.4)	WL10-10	10
0.8	6.4	6	5.9 (0.6)	15	15
0.8	6.4	8	7.8 (0.8)	20	20
0.9	10.8	10	9.8 (1.0)	25	25
0.9	10.8	12	11.8 (1.2)	30	30
0.9	10.8	14	13.7 (1.4)	35	35
0.9	10.8	16	15.7 (1.6)	40	40
1.0	17	18	17.7 (1.8)	45	45
1.0	17	20	19.6 (2.0)	50	50
1.0	17	22	21.6 (2.2)	55	55
1.0	17	24	23.5 (2.4)	60	60
1.1	24	26	25.5 (2.6)	65	65
1.1	24	28	27.5 (2.8)	70	70
1.1	24.2	32	31.4 (3.2)	80	80
0.8	4.8	4	4.0 (0.4)	WL12-10	10
0.9	7.2	6	5.9 (0.6)	15	15
0.9	7.2	8	7.8 (0.8)	20	20
0.9	7.2	10	9.8 (1.0)	25	25
1.0	10.5	12	11.8 (1.2)	30	30
1.0	10.5	14	13.7 (1.4)	35	35
1.0	10.5	16	15.7 (1.6)	40	40
1.1	15.4	18	17.7 (1.8)	45	45
1.1	15.4	20	19.6 (2.0)	50	50
1.1	15.4	22	21.6 (2.2)	55	55
1.2	22.8	24	23.5 (2.4)	60	60
1.2	22.8	26	25.5 (2.6)	65	65
1.2	22.8	28	27.5 (2.8)	70	70
1.3	34.5	32	31.4 (3.2)	80	80
0.85	5.1	4	4.0 (0.4)	WL13-10	10
0.9	6.3	6	5.9 (0.6)	15	15
1.0	8.7	8	7.8 (0.8)	20	20
1.0	8.7	10	9.8 (1.0)	25	25
1.1	13.2	12	11.8 (1.2)	30	30
1.1	13.2	14	13.7 (1.4)	35	35
1.1	13.2	16	15.7 (1.6)	40	40
1.1	13.2	18	17.7 (1.8)	45	45
1.1	13.2	20	19.6 (2.0)	50	50
1.1	13.2	22	21.6 (2.2)	55	55
1.1	13.2	24	23.5 (2.4)	60	60
1.2	18.6	26	25.5 (2.6)	65	65
1.2	18.6	28	27.5 (2.8)	70	70
1.4	37.8	32	31.4 (3.2)	80	80
1.4	37.8	36	35.3 (3.6)	90	90
1.0	7.5	6	5.9 (0.6)	WL14-15	15
1.0	7.5	8	7.8 (0.8)	20	20
1.0	7.5	10	9.8 (1.0)	25	25
1.1	11	12	11.8 (1.2)	30	30
1.1	11	14	13.7 (1.4)	35	35
1.1	11	16	15.7 (1.6)	40	40
1.2	15.6	18	17.7 (1.8)	45	45
1.2	15.6	20	19.6 (2.0)	50	50
1.2	15.6	22	21.6 (2.2)	55	55
1.2	15.6	24	23.5 (2.4)	60	60
1.3	22.1	26	25.5 (2.6)	65	65
1.3	22.1	28	27.5 (2.8)	70	70
1.3	22.1	32	31.4 (3.2)	80	80
1.5	43.5	36	35.3 (3.6)	90	90

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
1.1	8.2	6	5.9 (0.6)	WL16-15	15
1.1	8.2	8	7.8 (0.8)	20	20
1.2	10	10	9.8 (1.0)	25	25
1.2	10	12	11.8 (1.2)	30	30
1.2	10	14	13.7 (1.4)	35	35
1.2	10	16	15.7 (1.6)	40	40
1.4	21	18	17.7 (1.8)	45	45
1.4	21	20	19.6 (2.0)	50	50
1.4	21	22	21.6 (2.2)	55	55
1.4	21	24	23.5 (2.4)	60	60
1.5	29.7	26	25.5 (2.6)	65	65
1.5	29.7	28	27.5 (2.8)	70	70
1.5	29.7	32	31.4 (3.2)	80	80
1.6	40	36	35.3 (3.6)	90	90
1.5	10	8	23.5 (2.4)	WL18-20	20
1.6	12	10	29.4 (3.0)	25	25
1.6	12	12	35.3 (3.6)	30	30
1.7	16.2	14	41.2 (4.2)	35	35
1.7	16.2	16	47.1 (4.8)	40	40
1.8	19.8	18	53.0 (5.4)	45	45
1.8	19.8	20	58.8 (6.0)	50	50
1.8	19.8	22	64.7 (6.6)	55	55
1.8	19.8	24	70.6 (7.2)	60	60
2.0	32	26	76.5 (7.8)	65	65
2.0	32	28	82.4 (8.4)	70	70
2.0	32	32	94.1 (9.6)	80	80
2.2	43	36	105.9 (10.8)	90	90
2.2	43	40	117.7 (12.0)	100	100
1.6	10.4	8	23.5 (2.4)	WL20-20	20
1.6	10.4	10	29.4 (3.0)	25	25
1.7	12.8	12	35.3 (3.6)	30	30
1.7	12.8	14	41.2 (4.2)	35	35
1.8	15.8	16	47.1 (4.8)	40	40
1.8	15.8	18	53.0 (5.4)	45	45
1.8	15.8	20	58.8 (6.0)	50	50
1.8	15.8	22	64.7 (6.6)	55	55
2.0	24	24	70.6 (7.2)	60	60
2.0	24	26	76.5 (7.8)	65	65
2.0	24	28	82.4 (8.4)	70	70
2.2	37.4	32	94.1 (9.6)	80	80
2.2	37.4	36	105.9 (10.8)	90	90
2.2	37.4	40	117.7 (12.0)	100	100
1.7	10.8	8	23.5 (2.4)	WL22-20	20
1.8	13.3	10	29.4 (3.0)	25	25
1.8	13.3	12	35.3 (3.6)	30	30
1.8	13.3	14	41.2 (4.2)	35	35
2.0	20	16	47.1 (4.8)	40	40
2.0	20	18	53.0 (5.4)	45	45
2.					

ROUND WIRE COIL SPRINGS

— WM (35% DEFLECTION) · WH (30% DEFLECTION) —



Order

Catalog No.

WM13—60



Days to Ship

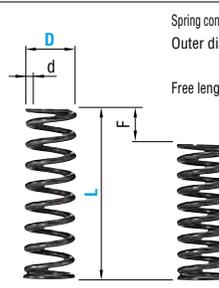
Quotation



Price

Quotation

WM
WH



Spring constant $\pm 10\%$
Outer dia. D $\phi 10$ or less $-0.5mm$
 $\phi 12$ or more $-0.8mm$
Free length L 50 or less $\pm 1.5mm$
 55 or more $\pm 2mm$

RoHS

SWP-A

Spring constant

Type	WY	WR	WF	WL	WT	WM	WH	WB
2				0.5 (0.05)				3.9 (0.4)
3								4.9 (0.5)
4								
5								
6								
8								
10								
12								
13								
14								
16								
18								
20								
22								
27								
Fmax.	F=LX75%	F=LX60%	F=LX45%	F=LX40%	F=LX40%	F=LX35%	F=LX30%	F=LX25%

WM : Fmax. (Maximum allowable deflection) = Lx35%

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.35	2.5	1.8	3.4 (0.4)	WM3—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)	WM4—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)	WM5—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	12.7	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)	WM6—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)	WM8—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	
1.3	44.2	28	82.4 (8.4)	90	

● Load calculation method: Load = Spring constant x Deflection (SI units) N = N/mm x Fmm kgf = kgf/mm x Fmm (kgf = N x 0.101972)

⊕ The solid height values are for reference only. There may be some variation between lots.
⊕ Operation count: 1 million
⊕ Instructions and precautions for the use of coil springs P.1397

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
0.9	5.2	3.5	9.8 (1.0)	WM10—10	
1.0	7.7	5.2	14.7 (1.5)	15	
1.0	7.7	7	20.6 (2.1)	20	
1.1	11	8.7	25.5 (2.6)	25	
1.1	11	10.5	30.4 (3.1)	30	
1.2	16.2	12.2	35.3 (3.6)	35	
1.2	16.2	14	41.2 (4.2)	40	
1.3	22.1	15.8	46.1 (4.7)	45	
1.3	22.1	17.5	51.0 (5.2)	50	
1.3	22.1	19.2	55.9 (5.7)	55	
1.4	32.1	21	61.8 (6.3)	60	
1.4	32.1	22.7	64.7 (6.6)	65	
1.4	32.1	24.5	71.6 (7.3)	70	
1.4	32.2	28	82.4 (8.4)	80	
1.0	5.5	3.5	10.3 (1.1)	WM12—10	
1.1	7.4	5.2	14.7 (1.5)	15	
1.1	7.4	7	20.6 (2.1)	20	
1.1	7.4	8.7	25.5 (2.6)	25	
1.2	10.2	10.5	30.4 (3.1)	30	
1.2	10.2	12.2	35.3 (3.6)	35	
1.3	14.3	14	41.2 (4.2)	40	
1.3	14.3	15.8	46.1 (4.7)	45	
1.3	14.3	17.5	51.0 (5.2)	50	
1.4	19.6	19.2	55.9 (5.7)	55	
1.4	19.6	21	61.8 (6.3)	60	
1.5	26.3	22.7	64.7 (6.6)	65	
1.5	26.3	24.5	71.6 (7.3)	70	
1.6	36.8	28	82.4 (8.4)	80	
1.0	5	3.5	10.3 (1.1)	WM13—10	
1.2	8.4	5.2	14.7 (1.5)	15	
1.3	11.7	7	20.6 (2.1)	20	
1.3	11.7	8.7	25.5 (2.6)	25	
1.4	14.5	10.5	30.4 (3.1)	30	
1.4	14.5	12.2	35.3 (3.6)	35	
1.4	14.5	14	41.2 (4.2)	40	
1.4	14.5	15.8	46.1 (4.7)	45	
1.4	14.5	17.5	51.0 (5.2)	50	
1.5	22.5	19.2	55.9 (5.7)	55	
1.5	22.5	21	61.8 (6.3)	60	
1.6	28.8	22.7	64.7 (6.6)	65	
1.6	28.8	24.5	71.6 (7.3)	70	
1.7	37.4	28	82.4 (8.4)	80	
1.7	37.4	31.5	92.7 (9.5)	90	
1.2	7.5	5.2	14.7 (1.5)	WM14—10	
1.3	9.8	7	20.6 (2.1)	20	
1.4	13.3	8.7	25.5 (2.6)	25	
1.4	13.3	10.5	30.4 (3.1)	30	
1.4	13.3	12.2	35.3 (3.6)	35	
1.4	13.3	14	41.2 (4.2)	40	
1.5	17.3	15.8	46.1 (4.7)	45	
1.5	17.3	17.5	51.0 (5.2)	50	
1.5	17.3	19.2	55.9 (5.7)	55	
1.6	23.2	21	61.8 (6.3)	60	
1.6	23.2	22.7	64.7 (6.6)	65	
1.7	30.6	24.5	71.6 (7.3)	70	
1.7	30.6	28	82.4 (8.4)	80	
1.8	39.6	31.5	92.7 (9.5)	90	

⊕ Maximum allowable deflection for size (L)
WM3—25 Fmax. = Lx30%
WM3—30 Fmax. = Lx30%
WM4—40 Fmax. = Lx30%
WM5—50 Fmax. = Lx30%
WM5—55 Fmax. = Lx30%
WM5—60 Fmax. = Lx30%
WM5—65 Fmax. = Lx27%
WM5—70 Fmax. = Lx28%
WM6—60 Fmax. = Lx30%
WM6—65 Fmax. = Lx29%
WM6—70 Fmax. = Lx28%
WM6—80 Fmax. = Lx28%
⊕ No grinding on either end of WM types marked with *.

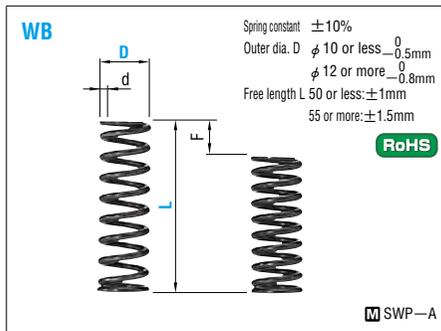
d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D—L	Base unit price
1.3	7.8	5.2	14.7 (1.5)	WM16—15	
1.4	9.8	7	20.6 (2.1)	20	
1.5	12.5	8.7	25.5 (2.6)	25	
1.5	12.5	10.5	30.4 (3.1)	30	
1.6	15	12.2	35.3 (3.6)	35	
1.6	15	14	41.2 (4.2)	40	
1.7	20.4	15.8	46.1 (4.7)	45	
1.7	20.4	17.5	51.0 (5.2)	50	
1.8	27	19.2	55.9 (5.7)	55	
1.8	27	21	61.8 (6.3)	60	
1.8	27	22.7	64.7 (6.6)	65	
1.8	27	24.5	71.6 (7.3)	70	
1.8	27	28	82.4 (8.4)	80	
1.9	34.2	31.5	92.7 (9.5)	90	
1.7	11.9	7	34.3 (3.5)	WM18—20	
1.8	14.4	8.7	42.2 (4.3)	25	
1.8	14.4	10.5	51.0 (5.2)	30	
1.8	14.4	12.2	59.8 (6.1)	35	
1.8	14.4	14	68.6 (7.0)	40	
2.0	22	15.8	77.5 (7.9)	45	
2.0	22	17.5	85.3 (8.7)	50	
2.0	22	19.2	94.1 (9.6)	55	
2.0	22	21	103.0 (10.5)	60	
2.2	34.1	22.7	110.8 (11.3)	65	
2.2	34.1	24.5	119.6 (12.2)	70	
2.2	34.1	28	137.3 (14.0)	80	
2.3	41.4	31.5	154.0 (15.7)	90	
2.3	41.4	35	171.6 (17.5)	100	
1.8	11.7	7	34.3 (3.5)	WM20—20	
1.8	11.7	8.7	42.2 (4.3)	25	
1.9	14.3	10.5	51.0 (5.2)	30	
1.9	14.3	12.2	59.8 (6.1)	35	
1.9	14.3	14	68.6 (7.0)	40	
2.0	17	15.8	77.5 (7.9)	45	
2.0	17	17.5	85.3 (8.7)	50	
2.2	24.8	19.2	94.1 (9.6)	55	
2.2	24.8	21	103.0 (10.5)	60	
2.2	24.8	22.7	110.8 (11.3)	65	
2.2	24.8	24.5	119.6 (12.2)	70	
2.4	36	28	137.3 (14.0)	80	
2.4	36	31.5	154.0 (15.7)	90	
2.4	36	35	171.6 (17.5)	100	
1.9	12	7	34.3 (3.5)	WM22—20	
2.0	14	8.7	42.2 (4.3)	25	
2.0	14	10.5	51.0 (5.2)	30	
2.0	14	12.2	59.8 (6.1)	35	
2.0	14	14	68.6 (7.0)	40	
2.3	23	15.8	77.5 (7.9)	45	
2.3	23	17.5	85.3 (8.7)	50	
2.3	23	19.2	94.1 (9.6)	55	
2.3	23	21	103.0 (10.5)	60	
2.4	30	22.7	110.8 (11.3)	65	
2.4	30	24.5	119.6 (12.2)	70	
2.6	40	31.5	154.0 (15.7)	80	
2.6	40	35	171.6 (17.5)	100	
2.3	14	10.5	51.0 (5.2)	WM27—30	
2.4	17	12.2	59.8 (6.1)	35	
2.4	17	14	68.6 (7.0)	40	
2.4	18	15.8	77.5 (7.9)	45	
2.6	23	17.5	85.3 (8.7)	50	
2.6	23	19.2	94.1 (9.6)	55	
2.6	23	21	103.0 (10.5)	60	
2.8	31	22.7	110.8 (11.3)	65	
2.8	31	24.5	119.6 (12.2)		

ROUND WIRE COIL SPRINGS

—WB (25% DEFLECTION)—

ROUND WIRE COIL SPRINGS

—NWL·NWM (INNER DIAMETER STANDARD TYPE) / WP (70% DEFLECTION, LONG TYPE)—



D	Spring constant								
	Type	WY	WR	WF	WL	WT	WM	WH	WB
2					0.5 (0.05)				3.9 (0.4)
3						1.5 (0.15)			4.9 (0.5)
4							2.0 (0.2)		
5								2.9 (0.3)	
6									N/mm 9.8 (kgf/mm 1.0)
8									N/mm 19.6 (kgf/mm 2.0)
10									29.4 (3.0)
12									
13									
14									
16									
18									
20									
22									
27									

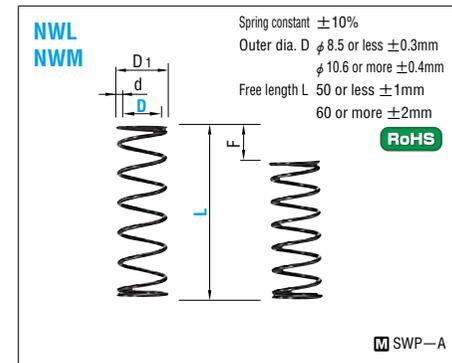
WB : Fmax. (maximum allowable deflection) = L×25%

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D-L	Base unit price
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	

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D-L	Base unit price
1.2	6	2.5	24.5 (2.5)	WB10-10	
1.3	8.5	3.8	37.3 (3.8)	15	
1.4	12	5	49.0 (5.0)	20	
1.5	16.5	6.3	61.8 (6.3)	25	
1.5	17	7.5	73.5 (7.5)	30	
1.6	23	8.8	86.3 (8.8)	35	
1.6	24	10	98.1 (10.0)	40	
1.7	30	11.3	110.8 (11.3)	45	
1.7	31.5	12.5	122.6 (12.5)	50	
1.8	40	13.8	135.3 (13.8)	55	
1.8	40	15	147.1 (15.0)	60	
1.8	43	16.3	159.8 (16.3)	65	
1.8	43	17.5	171.6 (17.5)	70	
1.8	54	20	196.1 (20.0)	80	
1.4	6.5	2.5	24.5 (2.5)	WB12-10	
1.4	7.7	3.8	36.3 (3.7)	15	
1.6	12.5	5	49.0 (5.0)	20	
1.6	13.6	6.3	60.8 (6.2)	25	
1.7	18	7.5	73.5 (7.5)	30	
1.8	22.5	8.8	85.3 (8.7)	35	
1.8	24	10	98.1 (10.0)	40	
1.8	24	11.3	109.8 (11.2)	45	
1.9	34	12.5	122.6 (12.5)	50	
2.0	38	13.8	134.4 (13.7)	55	
2.0	40	15	147.1 (15.0)	60	
2.0	42	16.3	158.9 (16.2)	65	
2.1	48.5	17.5	171.6 (17.5)	70	
2.1	52.5	20	196.1 (20.0)	80	
1.6	6.4	2.5	49.0 (5.0)	WB13-10	
1.8	11	3.8	74.5 (7.6)	15	
1.8	11	5	98.1 (10.0)	20	
2.0	17	6.3	123.6 (12.6)	25	
2.0	18	7.5	147.1 (15.0)	30	
2.1	22	8.8	172.6 (17.6)	35	
2.1	22	10	196.1 (20.0)	40	
2.3	32	11.3	221.6 (22.6)	45	
2.3	32	12.5	245.2 (25.0)	50	
2.4	40	13.8	270.7 (27.6)	55	
2.4	42	15	294.2 (30.0)	60	
2.4	42	16.3	319.7 (32.6)	65	
2.5	50	17.5	343.2 (35.0)	70	
2.5	50	20	392.3 (40.0)	80	
1.8	9	3.8	72.6 (7.4)	WB14-15	
2.0	13	5	98.1 (10.0)	20	
2.0	14	6.3	121.6 (12.4)	25	
2.1	18	7.5	147.1 (15.0)	30	
2.1	23	8.8	170.6 (17.4)	35	
2.3	26.3	10	196.1 (20.0)	40	
2.3	27.6	11.3	219.7 (22.4)	45	
2.4	31	12.5	245.2 (25.0)	50	
2.5	37.5	13.8	268.7 (27.4)	55	
2.5	41	15	294.2 (30.0)	60	
2.5	43.5	16.3	317.7 (32.4)	65	
2.6	48	17.5	343.2 (35.0)	70	
2.6	52	20	392.3 (40.0)	80	

d	Solid height	F max.	Load N (kgf) max.	Catalog No. Type D-L	Base unit price
2.0	10	3.8	74.5 (7.6)	WB16-15	
2.1	12.5	5	98.1 (10.0)	20	
2.3	17	6.3	123.6 (12.6)	25	
2.3	18.5	7.5	147.1 (15.0)	30	
2.4	21.5	8.8	172.6 (17.6)	35	
2.4	21.5	10	196.1 (20.0)	40	
2.5	27.5	11.3	221.6 (22.6)	45	
2.5	27.5	12.5	245.2 (25.0)	50	
2.6	32	13.8	270.7 (27.6)	55	
2.6	32	15	294.2 (30.0)	60	
2.8	46	16.3	319.7 (32.6)	65	
2.8	46	17.5	343.2 (35.0)	70	
2.9	55	20	392.3 (40.0)	80	
2.5	13.5	5	147.1 (15.0)	WB18-20	
2.6	17	6.3	185.3 (18.9)	25	
2.6	17	7.5	220.6 (22.5)	30	
2.8	23.5	8.8	258.9 (26.4)	35	
2.9	27.5	10	294.2 (30.0)	40	
2.9	27.5	11.3	332.4 (33.9)	45	
3.0	33	12.5	367.7 (37.5)	50	
3.0	33	13.8	406.0 (41.4)	55	
3.2	43	15	441.3 (45.0)	60	
3.2	44.5	16.3	479.5 (48.9)	65	
3.2	44.5	17.5	514.8 (52.5)	70	
3.4	58	20	588.4 (60.0)	80	
3.4	61	22.5	661.9 (67.5)	90	
3.5	71	25	735.5 (75.0)	100	
2.8	13.5	5	147.1 (15.0)	WB22-20	
2.9	16	6.3	185.3 (18.9)	25	
3.0	18	7.5	220.6 (22.5)	30	
3.0	18	8.8	258.9 (26.4)	35	
3.2	24	10	294.2 (30.0)	40	
3.2	24	11.3	332.4 (33.9)	45	
3.5	36	12.5	367.7 (37.5)	50	
3.5	36	13.8	406.0 (41.4)	55	
3.5	36	15	441.3 (45.0)	60	
3.6	45	16.3	479.5 (48.9)	65	
3.6	45	17.5	514.8 (52.5)	70	
3.8	57	20	588.4 (60.0)	80	
3.8	57	22.5	661.9 (67.5)	90	
4.0	72	25	735.5 (75.0)	100	
3.5	19	7.5	220.6 (22.5)	WB27-30	
3.6	21	8.8	258.9 (26.4)	35	
3.6	21	10	294.2 (30.0)	40	
3.8	30	11.3	332.4 (33.9)	45	
3.8	30	12.5	367.7 (37.5)	50	
4.0	38	13.8	406.0 (41.4)	55	
4.0	38	15	441.3 (45.0)	60	
4.0	38	16.3	479.5 (48.9)	65	
4.0	38	17.5	514.8 (52.5)	70	
4.3	57	20	588.4 (60.0)	80	
4.5	63	22.5	661.9 (67.5)	90	
4.5	67	25	735.5 (75.0)	100	

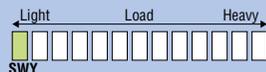
⚠ No grinding on either end of WB types marked with *.
⚠ The solid height values are for reference only. There may be some variation between lots.
⚠ Operation count: 1 million
⚠ Instructions and precautions for the use of coil springs P.1397



NWL : Fmax. (Maximum allowable deflection) = L×40%									
Pin dia.	D	D1	d	F max.	Solid height	Load N (kgf) max.	Spring constant N/mm (kgf/mm)	Catalog No. Type D-L	Base unit price
5	5.5	7	0.75	12	10.9	13.7 (1.4)	1.1 (0.12)	NWL5.5-30	
				14	12	16	1.0 (0.10)	35	
				16	13.5	18	0.9 (0.09)	40	
				18	15	20	0.8 (0.08)	45	
				20	16.5	22	0.7 (0.07)	50	
6	6.5	8.1	0.8	12	9.6	13.7 (1.4)	1.1 (0.12)	NWL6.5-30	
				14	10.8	16	1.0 (0.10)	35	
				16	12	18	0.9 (0.09)	40	
				18	13.2	20	0.8 (0.08)	45	
				20	14.4	22	0.7 (0.07)	50	
8	8.5	10.5	1.0	12	9.8	20.6 (2.1)	1.7 (0.18)	NWL8.5-30	
				14	10.8	24	1.5 (0.15)	35	
				16	12	28	1.3 (0.13)	40	
				18	13	32	1.1 (0.11)	45	
				20	14	36	1.0 (0.10)	50	

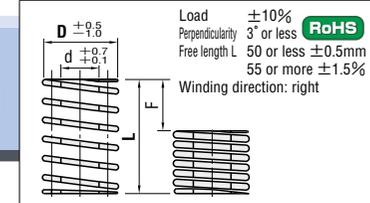
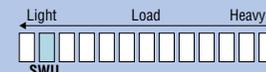
COIL SPRINGS

—SWY—



COIL SPRINGS

—SWU—



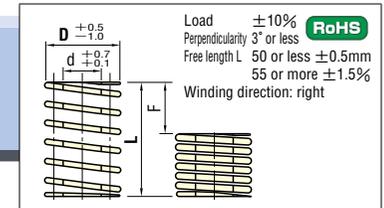
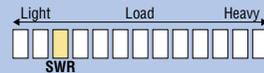
D	d	L	Spring constant N/mm (kgf/mm)	F=LX65% Fmm Load N (kgf)	Catalog No.	Base unit price
11	7	20	2.26 (0.23)	13.0	SWY11—20	13.0
		25	1.81 (0.18)	16.3		25
		30	1.51 (0.15)	19.5		30
		35	1.29 (0.13)	22.8		35
		40	1.13 (0.12)	26.0		40
		45	1.01 (0.10)	29.3		45
		50	0.91 (0.092)	32.5		50
		55	0.82 (0.084)	35.8		55
		60	0.75 (0.077)	39.0		60
		65	0.70 (0.071)	42.3		65
12.5	8.5	20	3.09 (0.32)	13.0	SWY12.5—20	13.0
		25	2.47 (0.25)	16.3		25
		30	2.06 (0.21)	19.5		30
		35	1.77 (0.18)	22.8		35
		40	1.55 (0.16)	26.0		40
		45	1.37 (0.14)	29.3		45
		50	1.24 (0.13)	32.5		50
		55	1.12 (0.11)	35.8		55
		60	1.03 (0.11)	39.0		60
		65	0.95 (0.10)	42.3		65
16.5	10.5	20	7.02 (0.72)	13.0	SWY16.5—20	13.0
		25	5.61 (0.57)	16.3		25
		30	4.68 (0.48)	19.5		30
		35	4.01 (0.41)	22.8		35
		40	3.51 (0.36)	26.0		40
		45	3.12 (0.32)	29.3		45
		50	2.81 (0.29)	32.5		50
		55	2.55 (0.26)	35.8		55
		60	2.34 (0.24)	39.0		60
		65	2.16 (0.22)	42.3		65
20	13.5	20	2.00 (0.20)	45.5	SWY20.5—30	45.5
		25	1.87 (0.19)	48.8		25
		30	1.75 (0.18)	52.0		30
		35	1.66 (0.16)	55.5		35
		40	1.56 (0.16)	58.5		40
		45	1.48 (0.15)	61.5		45
		50	1.40 (0.14)	64.5		50
		55	1.33 (0.13)	67.5		55
		60	1.27 (0.12)	70.5		60
		65	1.21 (0.11)	73.5		65
24.5	16.5	20	5.58 (0.57)	19.5	SWY24.5—30	19.5
		25	4.78 (0.49)	22.8		25
		30	4.19 (0.43)	26.0		30
		35	3.72 (0.38)	29.3		35
		40	3.35 (0.34)	32.5		40
		45	3.04 (0.31)	35.8		45
		50	2.79 (0.28)	39.0		50
		55	2.58 (0.26)	42.3		55
		60	2.39 (0.24)	45.5		60
		65	2.23 (0.23)	48.8		65
30	21	20	2.09 (0.21)	52.0	SWY30—35	52.0
		25	1.86 (0.19)	55.5		25
		30	1.67 (0.17)	60.0		30
		35	1.52 (0.16)	64.5		35
		40	1.40 (0.14)	69.0		40
		45	1.34 (0.14)	73.5		45
		50	1.29 (0.13)	78.0		50
		55	1.20 (0.12)	82.5		55
		60	1.12 (0.11)	87.0		60
		65	1.06 (0.11)	91.5		65
37	26	20	6.99 (0.71)	19.5	SWY37—40	19.5
		25	5.99 (0.61)	22.8		25
		30	5.24 (0.53)	26.0		30
		35	4.66 (0.48)	29.3		35
		40	4.19 (0.43)	32.5		40
		45	3.81 (0.39)	35.8		45
		50	3.50 (0.36)	39.0		50
		55	3.23 (0.33)	42.3		55
		60	3.00 (0.31)	45.5		60
		65	2.80 (0.29)	48.8		65
42	31	20	2.62 (0.27)	52.0	SWY42—50	52.0
		25	2.33 (0.24)	55.5		25
		30	2.10 (0.21)	60.0		30
		35	1.91 (0.19)	64.5		35
		40	1.75 (0.18)	69.0		40
		45	1.68 (0.17)	73.5		45
		50	1.61 (0.16)	78.0		50
		55	1.50 (0.15)	82.5		55
		60	1.40 (0.14)	87.0		60
		65	1.30 (0.13)	91.5		65
48	37	20	8.79 (0.90)	22.8	SWY48—50	22.8
		25	7.69 (0.78)	26.0		25
		30	6.84 (0.70)	29.3		30
		35	6.16 (0.63)	32.5		35
		40	5.60 (0.57)	35.8		40
		45	5.13 (0.52)	39.0		45
		50	4.74 (0.48)	42.3		50
		55	4.40 (0.45)	45.5		55
		60	4.10 (0.42)	48.8		60
		65	3.85 (0.39)	52.0		65
55	43	20	3.42 (0.35)	58.5	SWY55—60	58.5
		25	3.08 (0.31)	63.0		25
		30	2.80 (0.29)	67.5		30
		35	2.56 (0.26)	72.0		35
		40	2.37 (0.24)	76.5		40
		45	2.20 (0.22)	81.0		45
		50	2.05 (0.21)	85.5		50
		55	1.92 (0.20)	90.0		55
		60	1.81 (0.18)	94.5		60
		65	1.76 (0.18)	99.0		65
63	51	20	1.62 (0.17)	123.5	SWY63—70	123.5
		25	1.54 (0.16)	130.0		25
		30	1.46 (0.15)	136.5		30
		35	1.39 (0.14)	143.0		35
		40	1.32 (0.13)	149.5		40
		45	1.26 (0.13)	156.0		45
		50	1.20 (0.12)	162.5		50
		55	1.14 (0.11)	169.0		55
		60	1.09 (0.11)	175.5		60
		65	1.04 (0.10)	182.0		65

D	d	L	Spring constant N/mm (kgf/mm)	F=LX65% Fmm Load N (kgf)	Catalog No.	Base unit price
11	7	20	2.26 (0.23)	13.0	SWY11—20	13.0
		25	1.81 (0.18)	16.3		25
		30	1.51 (0.15)	19.5		30
		35	1.29 (0.13)	22.8		35
		40	1.13 (0.12)	26.0		40
		45	1.01 (0.10)	29.3		45
		50	0.91 (0.092)	32.5		50
		55	0.82 (0.084)	35.8		55
		60	0.75 (0.077)	39.0		60
		65	0.70 (0.071)	42.3		65
12.5	8.5	20	3.09 (0.32)	13.0	SWY12.5—20	13.0
		25	2.47 (0.25)	16.3		25
		30	2.06 (0.21)	19.5		30
		35	1.77 (0.18)	22.8		35
		40	1.55 (0.16)	26.0		40
		45	1.37 (0.14)	29.3		45
		50	1.24 (0.13)	32.5		50
		55	1.12 (0.11)	35.8		55
		60	1.03 (0.11)	39.0		60
		65	0.95 (0.10)	42.3		65
16.5	10.5	20	7.02 (0.72)	13.0	SWY16.5—20	13.0
		25	5.61 (0.57)	16.3		25
		30	4.68 (0.48)	19.5		30
		35	4.01 (0.41)	22.8		35
		40	3.51 (0.36)	26.0		40
		45	3.12 (0.32)	29.3		45
		50	2.81 (0.29)	32.5		50
		55	2.55 (0.26)	35.8		55
		60	2.34 (0.24)	39.0		60
		65	2.16 (0.22)	42.3		65
20	13.5	20	2.00 (0.20)	45.5	SWY20.5—30	45.5
		25	1.87 (0.19)	48.8		25
		30	1.75 (0.18)	52.0		30
		35	1.66 (0.16)	55.5		35
		40	1.56 (0.16)	58.5		40
		45	1.48 (0.15)	61.5		45
		50	1.40 (0.14)	64.5		50
		55	1.33 (0.13)	67.5		55
		60	1.27 (0.12)	70.5		60
		65	1.21 (0.11)	73.5		65
24.5	16.5	20	5.58 (0.57)	19.5	SWY24.5—30	19.5
		25	4.78 (0.49)	22.8		25
		30	4.19 (0.43)	26.0		30
		35	3.72 (0.38)	29.3		35
		40	3.35 (0.34)	32.5		40
		45	3.04 (0.31)	35.8		45
		50	2.79 (0.28)	39.0		50
		55	2.58 (0.26)	42.3		55
		60	2.39 (0.24)	45.5		60
		65	2.23 (0.23)	48.8		65
30	21	20	2.09 (0.21)	52.0	SWY30—35	52.0
		25	1.86 (0.19)	55.5		25
		30	1.67 (0.17)	60.0		30
		35	1.52 (0.16)	64.5		35
		40	1.40 (0.14)	69.0		40
		45	1.34 (0.14)	73.5		45
		50	1.29 (0.13)	78.0		50
		55	1.20 (0.12)	82.5		55
		60	1.12 (0.11)	87.0		60
		65	1.06 (0.11)	91.5		65
37	26	20	6.99 (0.71)	19.5	SWY37—40	19.5
		25	5.99 (0.61)	22.8		25
		30	5.24 (0.53)	26.0		30
		35	4.66 (0.48)	29.3		35
		40	4.19 (0.43)	32.5		40
		45	3.81 (0.39)	35.8		45
		50	3.50 (0.36)	39.0		50
		55	3.23 (0.33)	42.3		55
		60	3.00 (0.31)	45.5		60
		65	2.80 (0.29)	48.8		65
42	31	20	2.62 (0.27)	52.0	SWY42—50	52.0
		25	2.33 (0.24)	55.5		25
		30	2.10 (0.21)	60.0		30
		35	1.91 (0.19)	64.5		35
		40	1.75 (0.18)	69.0		40
		45	1.68 (0.17)	73.5		45
		50	1.61 (0.16)	78.0		50
		55	1.50 (0.15)	82.5		55
		60	1.40 (0.14)	87.0		60
		65	1.30 (0.13)	91.5		65
48	37	20	8.79 (0.90)	22.8	SWY48—50	22.8
		25	7.69 (0.78)	26.0		25
		30	6.84 (0.70)	29.3		30
		35	6.16 (0.63)	32.5		35
		40	5.60 (0.57)	35.8		40
		45	5.13 (0.52)	39.0		45
		50	4.74 (0.48)	42.3		50
		55	4.40 (0.45)	45.5		55
		60	4.10 (0.42)	48.8		60
		65	3.85 (0.39)	52.0		65
55	43	20	3.42 (0.35)	58.5	SWY55—60	58.5
		25	3.08 (0.31)	63.0		25
		30	2.80 (0.29)	67.5		30
		35	2.56 (0.26)	72.0		35
		40	2.37 (0.24)	76.5		40
		45	2.20 (0.22)	81.0		45
		50	2.05 (0.21)	85.5		50
		55	1.92 (0.20)	90.0		55
		60	1.81 (0.18)	94.5		60
		65	1.76 (0.18)	99.0		65
63	51	20	1.62 (0.17)	123.5	SWY63—70	123.5
		25	1.54 (0.16)	130.0		25
		30	1.46 (0.15)	136.5		30
		35	1.39 (0.14)	143.0		35
		40	1.32 (0.13)	149.5		40
		45	1.26 (0.13)	156.0		45
		50	1.20 (0.12)	162.5		50
		55	1.14 (0.11)	169.0		55
		60	1.09 (0.11)	175.5		60
		65	1.04 (0.10)	182.0		65

D	d	L	Spring constant N/mm (kgf/mm)	F=LX65% Fmm Load N (kgf)	Catalog No.	Base unit price
11	7	20	2.26 (0.23)	13.0		

COIL SPRINGS

—SWR—



D	d	L	Spring constant N/mm (kgf/mm)	F=L×50% Fmm Load N (kgf)	Catalog No. Type D—L	Base unit price 1 ~ 19 pieces
10.5	6.0	15	10.46 [1.07]	7.5	SWR10.5—15	78.5 {8.0}
		20	7.85 [0.80]	10.0		
		25	6.28 [0.64]	12.5		
		30	5.23 [0.53]	15.0		
		35	4.48 [0.46]	17.5		
		40	3.92 [0.40]	20.0		
		45	3.49 [0.36]	22.5		
		50	3.14 [0.32]	25.0		
		55	2.85 [0.29]	27.5		
		60	2.62 [0.27]	30.0		
		65	2.41 [0.25]	32.5		
		70	2.24 [0.23]	35.0		
		75	2.09 [0.21]	37.5		
		80	1.96 [0.20]	40.0		
		12.5	7.0	15		
20	8.83 [0.90]			10.0		
25	7.06 [0.72]			12.5		
30	5.88 [0.60]			15.0		
35	5.04 [0.51]			17.5		
40	4.41 [0.45]			20.0		
45	3.92 [0.40]			22.5		
50	3.53 [0.36]			25.0		
55	3.21 [0.33]			27.5		
60	2.94 [0.30]			30.0		
65	2.72 [0.28]			32.5		
70	2.52 [0.26]			35.0		
75	2.35 [0.24]			37.5		
80	2.21 [0.23]			40.0		
90	1.96 [0.20]			45.0		
100	1.77 [0.18]	50.0				
14.5	8.5	15	17.00 [1.73]	7.5	SWR14.5—15	127.5 {13.0}
		20	12.75 [1.30]	10.0		
		25	10.20 [1.04]	12.5		
		30	8.50 [0.87]	15.0		
		35	7.28 [0.74]	17.5		
		40	6.37 [0.65]	20.0		
		45	5.67 [0.58]	22.5		
		50	5.10 [0.52]	25.0		
		55	4.64 [0.47]	27.5		
		60	4.25 [0.43]	30.0		
		65	3.92 [0.40]	32.5		
		70	3.64 [0.37]	35.0		
		75	3.40 [0.35]	37.5		
		80	3.19 [0.33]	40.0		
		90	2.83 [0.29]	45.0		
100	2.55 [0.26]	50.0				
125	2.04 [0.21]	62.5				
150	1.70 [0.17]	75.0				

D	d	L	Spring constant N/mm (kgf/mm)	F=L×50% Fmm Load N (kgf)	Catalog No. Type D—L	Base unit price 1 ~ 19 pieces
17	10.5	20	19.61 [2.00]	10.0	SWR17—20	196.1 {20.0}
		25	15.69 [1.60]	12.5		
		30	13.08 [1.33]	15.0		
		35	11.21 [1.14]	17.5		
		40	9.81 [1.00]	20.0		
		45	8.72 [0.89]	22.5		
		50	7.85 [0.80]	25.0		
		55	7.13 [0.73]	27.5		
		60	6.54 [0.67]	30.0		
		65	6.03 [0.62]	32.5		
		70	5.60 [0.57]	35.0		
		75	5.23 [0.53]	37.5		
		80	4.90 [0.50]	40.0		
		90	4.36 [0.44]	45.0		
		100	3.92 [0.40]	50.0		
21	13.5	25	23.54 [2.40]	12.5	SWR21—25	294.2 {30.0}
		30	19.61 [2.00]	15.0		
		35	16.81 [1.71]	17.5		
		40	14.71 [1.50]	20.0		
		45	13.08 [1.33]	22.5		
		50	11.77 [1.20]	25.0		
		55	10.70 [1.09]	27.5		
		60	9.81 [1.00]	30.0		
		65	9.05 [0.92]	32.5		
		70	8.41 [0.86]	35.0		
		75	7.85 [0.80]	37.5		
		80	7.35 [0.75]	40.0		
		90	6.54 [0.67]	45.0		
		100	5.88 [0.60]	50.0		
		110	5.35 [0.55]	55.0		
26	16.5	25	31.38 [3.20]	12.5	SWR26—25	392.3 {40.0}
		30	26.15 [2.67]	15.0		
		35	22.42 [2.29]	17.5		
		40	19.61 [2.00]	20.0		
		45	17.43 [1.78]	22.5		
		50	15.69 [1.60]	25.0		
		55	14.26 [1.45]	27.5		
		60	13.08 [1.33]	30.0		
		65	12.07 [1.23]	32.5		
		70	11.21 [1.14]	35.0		
		75	10.46 [1.07]	37.5		
		80	9.81 [1.00]	40.0		
		90	8.72 [0.89]	45.0		
		100	7.85 [0.80]	50.0		
		110	7.13 [0.73]	55.0		
120	6.54 [0.67]	60.0				
125	6.28 [0.64]	62.5				
130	6.03 [0.62]	65.0				
140	5.60 [0.57]	70.0				
150	5.23 [0.53]	75.0				
175	4.48 [0.46]	87.5				
200	3.92 [0.40]	100.0				
225	3.49 [0.36]	112.5				
250	3.14 [0.32]	125.0				

D	d	L	Spring constant N/mm (kgf/mm)	F=L×50% Fmm Load N (kgf)	Catalog No. Type D—L	Base unit price 1 ~ 19 pieces
31	21	35	28.02 [2.86]	17.5	SWR31—35	490.3 {50.0}
		40	24.52 [2.50]	20.0		
		45	21.79 [2.22]	22.5		
		50	19.61 [2.00]	25.0		
		55	17.83 [1.82]	27.5		
		60	16.34 [1.67]	30.0		
		65	15.09 [1.54]	32.5		
		70	14.01 [1.43]	35.0		
		75	13.08 [1.33]	37.5		
		80	12.26 [1.25]	40.0		
		90	10.90 [1.11]	45.0		
		100	9.81 [1.00]	50.0		
		110	8.92 [0.91]	55.0		
		120	8.17 [0.83]	60.0		
		125	7.85 [0.80]	62.5		
37	26	35	33.62 [3.43]	17.5	SWR37—35	588.4 {60.0}
		40	29.42 [3.00]	20.0		
		45	26.15 [2.67]	22.5		
		50	23.54 [2.40]	25.0		
		55	21.40 [2.18]	27.5		
		60	19.61 [2.00]	30.0		
		65	18.10 [1.85]	32.5		
		70	16.81 [1.71]	35.0		
		75	15.69 [1.60]	37.5		
		80	14.71 [1.50]	40.0		
		90	13.08 [1.33]	45.0		
		100	11.77 [1.20]	50.0		
		110	10.70 [1.09]	55.0		
		120	9.81 [1.00]	60.0		
		125	9.41 [0.96]	62.5		
130	9.05 [0.92]	65.0				
140	8.41 [0.86]	70.0				
150	7.85 [0.80]	75.0				
160	7.35 [0.75]	80.0				
170	6.92 [0.71]	85.0				
175	6.72 [0.69]	87.5				
180	6.54 [0.67]	90.0				
190	6.19 [0.63]	95.0				
200	5.88 [0.60]	100.0				
250	4.71 [0.48]	125.0				
300	3.92 [0.40]	150.0				

D	d	L	Spring constant N/mm (kgf/mm)	F=L×50% Fmm Load N (kgf)	Catalog No. Type D—L	Base unit price 1 ~ 19 pieces
43	31	50	33.34 [3.40]	25.0	SWR43—50	833.6 {85.0}
		60	27.79 [2.83]	30.0		
		70	23.82 [2.43]	35.0		
		80	20.84 [2.13]	40.0		
		90	18.52 [1.89]	45.0		
		100	16.67 [1.70]	50.0		
		110	15.16 [1.55]	55.0		
		120	13.89 [1.42]	60.0		
		130	12.82 [1.31]	65.0		
		140	11.91 [1.21]	70.0		
		150	11.11 [1.13]	75.0		
		160	10.42 [1.06]	80.0		
		170	9.81 [1.00]	85.0		
		180	9.26 [0.94]	90.0		
		190	8.77 [0.89]	95.0		
46	33	50	43.15 [4.40]	25.0	SWR46—50	1079 {110}
		60	35.96 [3.67]	30.0		
		70	30.82 [3.14]	35.0		
		80	26.97 [2.75]	40.0		
		90	23.97 [2.44]	45.0		
		100	21.57 [2.20]	50.0		
		110	19.61 [2.00]	55.0		
		120	17.98 [1.83]	60.0		
		125	17.26 [1.76]	62.5		
		130	16.60 [1.69]	65.0		
		140	15.41 [1.57]	70.0		
		150	14.38 [1.47]	75.0		
		175	12.33 [1.26]	87.5		
		200	10.79 [1.10]	100.0		
		225	9.59 [0.98]	112.5		
50	36	50	52.96 [5.40]	25.0	SWR50—50	1324 {135}
		60	44.13 [4.50]	30.0		
		70	37.83 [3.86]	35.0		
		80	33.10 [3.38]	40.0		
		90	29.42 [3.00]	45.0		
		100	26.48 [2.70]	50.0		
		110	24.07 [2.45]	55.0		
		120	22.06 [2.25]	60.0		
		130	20.37 [2.08]	65.0		
		140	18.91 [1.93]	70.0		
		150	17.65 [1.80]	75.0		
		175	15.13 [1.54]	87.5		
		200	13.24 [1.35]	100.0		
		225	11.77 [1.20]	112.5		
		250	10.59 [1.08]	125.0		
275	9.63 [0.98]	137.5				
300	8.83 [0.90]	150.0				
350	7.57 [0.77]	175.0				
400	6.62 [0.68]	200.0				

● Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

- ⚙ Operation count: 1 million (300,000 for L×55%)
- 📄 Product guide [P.1396](#)
- 📈 Load graph [P.1432](#)
- 📖 Instructions and precautions for the use of coil springs [P.1397](#)
- 📏 Clearance of D dim. and counterbore hole, and of d dim. and shaft [P.1397](#)

Order **Catalog No.**
SWR 37—40

Days to Ship **Quotation**

Price **Quotation**

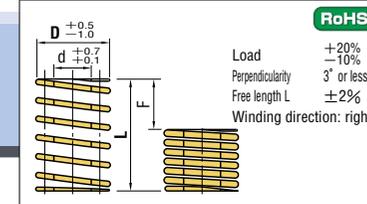
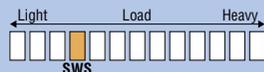
Alterations (NT) — Catalog No.
NT — SWR 31—60
Quotation

Alteration	Code	Spec.	Price
No coating	NT	Coating removal Removal of the coil spring coating by shot peening ⚠ Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. ⚠ There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.	Quotation

COIL SPRINGS

COIL SPRINGS

—SWS—



D	d	L	Spring constant		F=L×40%	Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm			
10.5	5.5	20	10.90 [1.11]	8.0	87.2 (8.9)	SWS10.5-20	1~19 pieces
		25	8.72 [0.89]	10.0			25
		30	7.27 [0.74]	12.0			30
		35	6.23 [0.64]	14.0			35
		40	5.45 [0.56]	16.0			40
		45	4.84 [0.49]	18.0			45
		50	4.36 [0.44]	20.0			50
		55	3.96 [0.40]	22.0			55
		60	3.63 [0.37]	24.0			60
		65	3.35 [0.34]	26.0			65
12.5	6.5	20	15.25 [1.56]	8.0	122.0 (12.4)	SWS12.5-20	Quotation
		25	12.20 [1.24]	10.0			25
		30	10.17 [1.04]	12.0			30
		35	8.71 [0.89]	14.0			35
		40	7.63 [0.78]	16.0			40
		45	6.78 [0.69]	18.0			45
		50	6.10 [0.62]	20.0			50
		55	5.55 [0.57]	22.0			55
		60	5.08 [0.52]	24.0			60
		65	4.69 [0.48]	26.0			65
14.5	8.5	20	24.50 [2.50]	8.0	196.0 (20.0)	SWS14.5-20	Quotation
		25	19.61 [2.00]	10.0			25
		30	16.33 [1.67]	12.0			30
		35	14.00 [1.43]	14.0			35
		40	12.25 [1.25]	16.0			40
		45	10.89 [1.11]	18.0			45
		50	9.80 [1.00]	20.0			50
		55	8.91 [0.91]	22.0			55
		60	8.17 [0.83]	24.0			60
		65	7.54 [0.77]	26.0			65

D	d	L	Spring constant		F=L×40%	Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm			
17	10.5	25	29.42 [3.00]	10.0	294.2 (30.0)	SWS17-25	1~19 pieces
		30	24.52 [2.50]	12.0			30
		35	21.01 [2.14]	14.0			35
		40	18.39 [1.88]	16.0			40
		45	16.34 [1.67]	18.0			45
		50	14.71 [1.50]	20.0			50
		55	13.37 [1.36]	22.0			55
		60	12.26 [1.25]	24.0			60
		65	11.32 [1.15]	26.0			65
		70	10.51 [1.07]	28.0			70
21	13.5	30	35.17 [3.59]	12.0	422.0 (43.0)	SWS21-30	Quotation
		35	30.14 [3.07]	14.0			35
		40	26.38 [2.69]	16.0			40
		45	23.44 [2.39]	18.0			45
		50	21.10 [2.15]	20.0			50
		55	19.18 [1.96]	22.0			55
		60	17.58 [1.79]	24.0			60
		65	16.23 [1.66]	26.0			65
		70	15.07 [1.54]	28.0			70
		75	14.07 [1.43]	30.0			75
26	16.5	30	47.42 [4.84]	12.0	569.0 (58.0)	SWS26-30	Quotation
		35	40.64 [4.14]	14.0			35
		40	35.56 [3.63]	16.0			40
		45	31.61 [3.22]	18.0			45
		50	28.45 [2.90]	20.0			50
		55	25.86 [2.64]	22.0			55
		60	23.71 [2.42]	24.0			60
		65	21.88 [2.23]	26.0			65
		70	20.32 [2.07]	28.0			70
		75	18.97 [1.93]	30.0			75

D	d	L	Spring constant		F=L×40%	Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm			
31	21	40	49.00 [5.00]	16.0	784.0 (79.9)	SWS31-40	1~19 pieces
		45	43.56 [4.44]	18.0			45
		50	39.20 [4.00]	20.0			50
		55	35.64 [3.63]	22.0			55
		60	32.67 [3.33]	24.0			60
		65	30.15 [3.07]	26.0			65
		70	28.00 [2.86]	28.0			70
		75	26.13 [2.66]	30.0			75
		80	24.50 [2.50]	32.0			80
		90	21.78 [2.22]	36.0			90
37	26	40	52.13 [5.32]	16.0	834.0 (85.0)	SWS37-40	Quotation
		45	46.33 [4.72]	18.0			45
		50	41.70 [4.25]	20.0			50
		55	37.91 [3.87]	22.0			55
		60	34.75 [3.54]	24.0			60
		65	32.08 [3.27]	26.0			65
		70	29.79 [3.04]	28.0			70
		75	27.80 [2.83]	30.0			75
		80	26.06 [2.66]	32.0			80
		90	23.17 [2.36]	36.0			90

D	d	L	Spring constant		F=L×40%	Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm			
44.5	31	50	50.15 [5.11]	20.0	1003 (102)	SWS44.5-50	1~19 pieces
		60	41.79 [4.26]	24.0			60
		70	35.82 [3.65]	28.0			70
		80	31.34 [3.20]	32.0			80
		90	27.86 [2.84]	36.0			90
		100	25.08 [2.56]	40.0			100
		110	22.80 [2.32]	44.0			110
		120	20.90 [2.13]	48.0			120
		130	19.29 [1.97]	52.0			130
		140	17.91 [1.83]	56.0			140
46	33	50	63.74 [6.50]	20.0	1275 (130)	SWS46-50	Quotation
		60	53.12 [5.42]	24.0			60
		70	45.53 [4.64]	28.0			70
		80	39.84 [4.06]	32.0			80
		90	35.41 [3.61]	36.0			90
		100	31.87 [3.25]	40.0			100
		110	28.97 [2.95]	44.0			110
		120	26.56 [2.71]	48.0			120
		125	25.50 [2.60]	50.0			125
		140	22.77 [2.32]	56.0			140
52	37	60	65.42 [6.67]	24.0	1570 (160)	SWS52-60	Quotation
		70	56.07 [5.72]	28.0			70
		80	49.06 [5.00]	32.0			80
		90	43.61 [4.45]	36.0			90
		100	39.25 [4.00]	40.0			100
		110	35.68 [3.64]	44.0			110
		120	32.71 [3.34]	48.0			120
		130	30.19 [3.08]	52.0			130
		140	28.04 [2.86]	56.0			140
		150	26.17 [2.67]	60.0			150

- Load calculation method: Load=Spring constant×Deflection (SI unit) N=N/mm×Fmm (kgf=kgf/mm×Fmm (kgf=N×0.101972))
- Operation count: 1 million (300,000 for L×45%)
- Product guide **P.1396**
- Load graph **P.1432**
- Instructions and precautions for the use of coil springs **P.1397**
- Clearance of D dim. and counterbore hole, and of d dim. and shaft **P.1397**

Order **Catalog No.**
SWS 21-100

Days to Ship **Quotation**

Price **Quotation**

Alterations (NT) — **Catalog No.**
NT — SWS 31-70

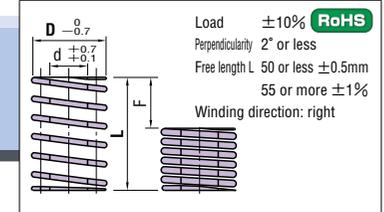
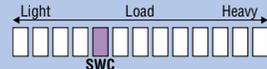
Quotation

Alteration	Code	Spec.	Price
No coating	NT	Coating removal Removal of the coil spring coating by shot peening Springs with the coating removed are extremely susceptible to corrosion. Handle them with care. Corrosion of the spring will result in early breakage. There may be greater variation in the load capacity and other characteristics between lots than with ordinary coated products.	Quotation

COIL SPRINGS

COIL SPRINGS

—SWC—



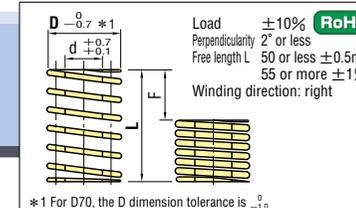
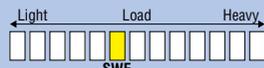
D	d	L	Spring constant N/mm (kgf/mm)	F=LX50%		F=LX55%		F=LX60%		Catalog No.	Base unit price				
				Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)						
6	3	15	3.60 (0.37)	7.5	8.3	Out of range									
			20	2.70 (0.28)	10.0	11.0	Out of range								
			25	2.16 (0.22)	12.5	13.8	Out of range								
			30	1.80 (0.18)	15.0	16.5	Out of range								
			35	1.54 (0.16)	17.5	19.3	Out of range								
			40	1.35 (0.14)	20.0	22.0	Out of range								
8	4.6	20	3.81 (0.39)	7.5	8.3	Out of range									
			25	2.86 (0.29)	10.0	11.0	Out of range								
			30	2.29 (0.23)	12.5	13.8	Out of range								
			35	1.91 (0.19)	15.0	16.5	Out of range								
			40	1.63 (0.17)	17.5	19.3	Out of range								
			45	1.43 (0.15)	20.0	22.0	Out of range								
			50	1.27 (0.13)	22.5	24.8	Out of range								
			55	1.14 (0.12)	25.0	27.5	Out of range								
			60	1.04 (0.11)	27.5	30.3	Out of range								
			65	0.95 (0.10)	30.0	33.0	Out of range								
			70	0.88 (0.09)	32.5	35.8	Out of range								
			75	0.82 (0.08)	35.0	38.5	Out of range								
80	0.76 (0.08)	37.5	41.3	Out of range											
85	0.72 (0.07)	40.0	44.0	Out of range											
10	5.8	25	6.10 (0.62)	7.5	8.3	Out of range									
			20	4.58 (0.47)	10.0	11.0	Out of range								
			15	3.66 (0.37)	12.5	13.8	Out of range								
			10	3.05 (0.31)	15.0	16.5	Out of range								
			5	2.62 (0.27)	17.5	19.3	Out of range								
			0	2.29 (0.23)	20.0	22.0	Out of range								
			0	2.03 (0.21)	22.5	24.8	Out of range								
			0	1.83 (0.19)	25.0	27.5	Out of range								
			0	1.66 (0.17)	27.5	30.3	Out of range								
			0	1.53 (0.16)	30.0	33.0	Out of range								
			0	1.41 (0.14)	32.5	35.8	Out of range								
			0	1.31 (0.13)	35.0	38.5	Out of range								
			0	1.22 (0.12)	37.5	41.3	Out of range								
			0	1.14 (0.12)	40.0	44.0	Out of range								
			0	1.02 (0.10)	45.0	49.5	Out of range								
			12	7.4	30	5.48 (0.56)	10.0	11.0	Out of range						
						25	4.38 (0.45)	12.5	13.8	Out of range					
						20	3.65 (0.37)	15.0	16.5	Out of range					
15	3.13 (0.32)	17.5				19.3	Out of range								
10	2.74 (0.28)	20.0				22.0	Out of range								
5	2.43 (0.25)	22.5				24.8	Out of range								
0	2.19 (0.22)	25.0				27.5	Out of range								
0	1.99 (0.20)	27.5				30.3	Out of range								
0	1.83 (0.19)	30.0				33.0	Out of range								
0	1.68 (0.17)	32.5				35.8	Out of range								
0	1.56 (0.16)	35.0				38.5	Out of range								
0	1.46 (0.15)	37.5				41.3	Out of range								
0	1.37 (0.14)	40.0				44.0	Out of range								
0	1.22 (0.12)	45.0				49.5	Out of range								
14	8.5	35				8.17 (0.83)	12.5	13.8	Out of range						
						30	6.81 (0.69)	15.0	16.5	Out of range					
						25	5.84 (0.60)	17.5	19.3	Out of range					
						20	5.11 (0.52)	20.0	22.0	Out of range					
			15	4.54 (0.46)	22.5	24.8	Out of range								
			10	4.09 (0.42)	25.0	27.5	Out of range								
			5	3.71 (0.38)	27.5	30.3	Out of range								
			0	3.41 (0.35)	30.0	33.0	Out of range								
			0	3.14 (0.32)	32.5	35.8	Out of range								
			0	2.92 (0.30)	35.0	38.5	Out of range								
			0	2.72 (0.28)	37.5	41.3	Out of range								
			0	2.55 (0.26)	40.0	44.0	Out of range								
			0	2.27 (0.23)	45.0	49.5	Out of range								
			0	2.04 (0.21)	50.0	55.0	Out of range								

D	d	L	Spring constant N/mm (kgf/mm)	F=LX50%		F=LX55%		F=LX60%		Catalog No.	Base unit price	
				Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)			
16	9.5	25	9.15 (0.93)	12.5	13.8	Out of range						
			30	7.63 (0.78)	15.0	16.5	Out of range					
			35	6.54 (0.67)	17.5	19.3	Out of range					
			40	5.72 (0.58)	20.0	22.0	Out of range					
			45	5.08 (0.52)	22.5	24.8	Out of range					
			50	4.58 (0.47)	25.0	27.5	Out of range					
			55	4.16 (0.42)	27.5	30.3	Out of range					
			60	3.81 (0.39)	30.0	33.0	Out of range					
			65	3.52 (0.36)	32.5	35.8	Out of range					
			70	3.27 (0.33)	35.0	38.5	Out of range					
			75	3.05 (0.31)	37.5	41.3	Out of range					
			80	2.86 (0.29)	40.0	44.0	Out of range					
18	11	30	10.46 (1.07)	12.5	13.8	Out of range						
			30	8.72 (0.89)	15.0	16.5	Out of range					
			35	7.47 (0.76)	17.5	19.3	Out of range					
			40	6.54 (0.67)	20.0	22.0	Out of range					
			45	5.81 (0.59)	22.5	24.8	Out of range					
			50	5.23 (0.53)	25.0	27.5	Out of range					
			55	4.75 (0.48)	27.5	30.3	Out of range					
			60	4.36 (0.44)	30.0	33.0	Out of range					
			65	4.02 (0.41)	32.5	35.8	Out of range					
			70	3.74 (0.38)	35.0	38.5	Out of range					
			75	3.49 (0.36)	37.5	41.3	Out of range					
			80	3.27 (0.33)	40.0	44.0	Out of range					
20	12.5	35	14.38 (1.47)	12.5	13.8	Out of range						
			30	11.99 (1.22)	15.0	16.5	Out of range					
			25	10.27 (1.05)	17.5	19.3	Out of range					
			20	8.99 (0.92)	20.0	22.0	Out of range					
			15	7.99 (0.81)	22.5	24.8	Out of range					
			10	7.19 (0.73)	25.0	27.5	Out of range					
			5	6.54 (0.67)	27.5	30.3	Out of range					
			0	5.99 (0.61)	30.0	33.0	Out of range					
			0	5.53 (0.56)	32.5	35.8	Out of range					
			0	5.14 (0.52)	35.0	38.5	Out of range					
			0	4.79 (0.49)	37.5	41.3	Out of range					
			0	4.49 (0.46)	40.0	44.0	Out of range					
0	4.00 (0.41)	45.0	49.5	Out of range								
0	3.60 (0.37)	50.0	55.0	Out of range								
0	2.88 (0.29)	62.5	68.8	Out of range								
0	2.40 (0.24)	75.0	82.5	Out of range								
22	13.5	40	19.61 (2.00)	12.5	13.8	Out of range						
			30	16.34 (1.67)	15.0	16.5	Out of range					
			25	14.01 (1.43)	17.5	19.3	Out of range					
			20	12.26 (1.25)	20.0	22.0	Out of range					
			15	10.90 (1.11)	22.5	24.8	Out of range					
			10	9.81 (1.00)	25.0	27.5	Out of range					
			5	8.92 (0.91)	27.5	30.3	Out of range					
			0	8.17 (0.83)	30.0	33.0	Out of range					
			0	7.54 (0.77)	32.5	35.8	Out of range					
			0	7.00 (0.71)	35.0	38.5	Out of range					
			0	6.54 (0.67)	37.5	41.3	Out of range					
			0	6.13 (0.63)	40.0	44.0	Out of range					
0	5.45 (0.56)	45.0	49.5	Out of range								
0	4.90 (0.50)	50.0	55.0	Out of range								
0	3.92 (0.40)	62.5	68.8	Out of range								
0	3.27 (0.33)	75.0	82.5	Out of range								

D	d	L	Spring constant N/mm (kgf/mm)	F=LX50%		F=LX55%		F=LX60%		Catalog No.	Base unit price	
				Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)			
25	16	25	24.19 (2.47)	12.5	13.8	Out of range						
			30	20.16 (2.06)	15.0	16.5	Out of range					
			35	17.28 (1.76)	17.5	19.3	Out of range					
			40	15.12 (1.54)	20.0	22.0	Out of range					
			45	13.44 (1.37)	22.5	24.8	Out of range					
			50	12.09 (1.23)	25.0	27.5	Out of range					
			55	11.00 (1.12)	27.5	30.3	Out of range					
			60	10.08 (1.03)	30.0	33.0	Out of range					
			65	9.30 (0.95)	32.5	35.8	Out of range					
			70	8.64 (0.88)	35.0	38.5	Out of range					
			75	8.06 (0.82)	37.5	41.3	Out of range					
			80	7.56 (0.77)	40.0	44.0	Out of range					
85	7.12 (0.72)	42.5	46.7	Out of range								
90	6.72 (0.69)	45.0	49.5	Out of range								
95	6.36 (0.65)	47.5	52.2	Out of range								
100	6.03 (0.62)	50.0	55.0	Out of range								
105	5.73 (0.59)	52.5	57.7	Out of range								
110	5.46 (0.56)	55.0	60.3	Out of range								
115	5.21 (0.53)	57.5	62.8	Out of range								
120	5.00 (0.51)	60.0	65.2	Out of range								
27	17.5	30	28.11 (2.87)	12.5	13.8	Out of range						
			30	23.43 (2.39)	15.0	16.5	Out of range					
			35	20.08 (2.05)	17.5	19.3	Out of range					
			40	17.57 (1.79)	20.0	22.0	Out of range					
			45	15.62 (1.59)	22.5	24.8	Out of range					
			50	14.06 (1.43)	25.0	27.5	Out of range					
			55	12.78 (1.30)	27.5	30.3	Out of range					
			60	11.71 (1.19)	30.0	33.0	Out of range					
			65	10.81 (1.10)	32.5	35.8	Out of range					
			70	10.04 (1.02)	35.0	38.5	Out of range					
			75	9.37 (0.96)	37.5	41.3	Out of range					
			80	8.79 (0.90)	40.0	44.0	Out of range					
85	8.26 (0.85)	42.5	46.7	Out of range								
90	7.78 (0.80)	45.0	49.5	Out of range								
95	7.34 (0.75)	47.5	52.2	Out of range								
100	7.03 (0.72)	50.0	55.0	Out of range								
105	6.72 (0.69)	52.5	57.7	Out of range								
110	6.43 (0.66)	55.0	60.3	Out of range								
115	6.16 (0.63)	57.5	62.8	Out of range								
120	5.91 (0.60)	60.0	65.2	Out of range								
30	20	35	31.38 (3.20)	12.5	13.8	Out of range						
			30	26.15 (2.67)	15.0	16.5	Out of range					
			25	22.42 (2.29)	17.5	19.3	Out of range					
			20	19.61 (2.00)	20.0	22.0	Out of range					
			15	17.43 (1.78)	22.5	24.8	Out of range					
			10	15.69 (1.60)	25.0	27.5	Out of range					
			5	14.26 (1.45)	27.5	30.3	Out of range					
			0	13.08 (1.33)	30.0	33.0	Out of range					
			0	12.07 (1.23)	32.5	35.8	Out of range					
			0	11.21 (1.14)	35.0	38.5	Out of range					
			0	10.46 (1.07)	37.5	41.3	Out of range					
			0	9.81 (1.00)	40.0	44.0	Out of range					
0	9.26 (0.95)	42.5	46.7	Out of range								
0	8.72 (0.89)	45.0	49.5	Out of range								
0	8.20 (0.84)	47.5	52.2	Out of range								
0	7.70 (0.79)	50.0	55.0	Out of range								
0	7.22 (0.74)	52.5	57.7	Out of range								
0	6.76 (0.69)	55.0	60.3	Out of range								
0	6.32 (0.65)	57.5	62.8	Out of range								
0	5.90 (0.61)	60.0	65.2	Out of range								
0	5.50 (0.57)	62.5	67.7									

COIL SPRINGS

—SWF—

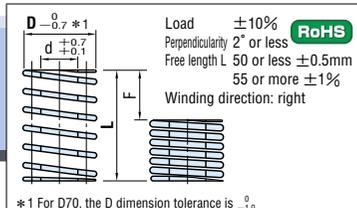
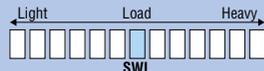


D	d	L	Spring constant N/mm (kgf/mm)	F=L×40%			F=L×45%			F=L×50%			Catalog No.	Base unit price
				Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count		
6	3	15	7.8 (0.80)	6.0	6.8	7.5	7.5	8.0	8.0	8.0	8.0	SWF6—15	1~19 pieces	
		20	5.9 (0.60)	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	20		
		25	4.7 (0.48)	10.0	11.3 (5.4)	12.5	13.5	15.0	15.0	15.0	15.0	25		
		30	3.9 (0.40)	12.0	15.8	17.5	18.0	20.0	20.0	20.0	20.0	30		
		35	3.4 (0.34)	14.0	18.0	20.0	20.0	20.0	20.0	20.0	20.0	35		
8	4	10	15.7 (1.60)	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	SWF8—10	1~19 pieces	
		15	10.5 (1.07)	6.0	6.8	7.5	7.5	7.5	7.5	7.5	7.5	15		
		20	7.8 (0.80)	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	20		
		25	6.3 (0.64)	10.0	11.2	12.5	12.5	12.5	12.5	12.5	12.5	25		
		30	5.2 (0.53)	12.0	13.5	15.0	15.0	15.0	15.0	15.0	15.0	30		
		35	4.5 (0.46)	14.0	15.7	17.5	17.5	17.5	17.5	17.5	17.5	35		
		40	3.9 (0.40)	16.0	18.0	20.0	20.0	20.0	20.0	20.0	20.0	40		
		45	3.5 (0.36)	18.0	20.2	22.5	22.5	22.5	22.5	22.5	22.5	45		
		50	3.1 (0.32)	20.0	22.5	25.0	25.0	25.0	25.0	25.0	25.0	50		
		55	2.9 (0.29)	22.0	24.7	27.5	27.5	27.5	27.5	27.5	27.5	55		
		60	2.6 (0.27)	24.0	27.0	30.0	30.0	30.0	30.0	30.0	30.0	60		
		65	2.4 (0.25)	26.0	29.3	32.5	32.5	32.5	32.5	32.5	32.5	65		
		70	2.2 (0.23)	28.0	31.5	35.0	35.0	35.0	35.0	35.0	35.0	70		
		75	2.1 (0.21)	30.0	33.8	37.5	37.5	37.5	37.5	37.5	37.5	75		
		80	2.0 (0.20)	32.0	36.0	40.0	40.0	40.0	40.0	40.0	40.0	80		
10	5	10	19.6 (2.00)	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	SWF10—10	Quotation	
		15	13.1 (1.33)	6.0	6.8	7.5	7.5	7.5	7.5	7.5	7.5	15		
		20	9.8 (1.00)	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	20		
		25	7.8 (0.80)	10.0	11.2	12.5	12.5	12.5	12.5	12.5	12.5	25		
		30	6.5 (0.67)	12.0	13.5	15.0	15.0	15.0	15.0	15.0	15.0	30		
		35	5.9 (0.57)	14.0	15.7	17.5	17.5	17.5	17.5	17.5	17.5	35		
		40	4.9 (0.50)	16.0	18.0	20.0	20.0	20.0	20.0	20.0	20.0	40		
		45	4.4 (0.44)	18.0	20.2	22.5	22.5	22.5	22.5	22.5	22.5	45		
		50	3.9 (0.40)	20.0	22.5	25.0	25.0	25.0	25.0	25.0	25.0	50		
		55	3.6 (0.36)	22.0	24.7	27.5	27.5	27.5	27.5	27.5	27.5	55		
		60	3.3 (0.33)	24.0	27.0	30.0	30.0	30.0	30.0	30.0	30.0	60		
		65	3.0 (0.31)	26.0	29.2	32.5	32.5	32.5	32.5	32.5	32.5	65		
		70	2.8 (0.29)	28.0	31.5	35.0	35.0	35.0	35.0	35.0	35.0	70		
		75	2.6 (0.27)	30.0	33.7	37.5	37.5	37.5	37.5	37.5	37.5	75		
		80	2.5 (0.25)	32.0	36.0	40.0	40.0	40.0	40.0	40.0	40.0	80		
90	2.2 (0.22)	36.0	40.5	45.0	45.0	45.0	45.0	45.0	45.0	90				
12	6	15	18.3 (1.87)	6.0	6.8	7.5	7.5	7.5	7.5	7.5	7.5	SWF12—15	Quotation	
		20	13.7 (1.40)	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	20		
		25	11.0 (1.12)	10.0	11.2	12.5	12.5	12.5	12.5	12.5	12.5	25		
		30	9.2 (0.93)	12.0	13.5	15.0	15.0	15.0	15.0	15.0	15.0	30		
		35	7.8 (0.80)	14.0	15.7	17.5	17.5	17.5	17.5	17.5	17.5	35		
		40	6.9 (0.70)	16.0	18.0	20.0	20.0	20.0	20.0	20.0	20.0	40		
		45	6.1 (0.62)	18.0	20.2	22.5	22.5	22.5	22.5	22.5	22.5	45		
		50	5.5 (0.56)	20.0	22.5	25.0	25.0	25.0	25.0	25.0	25.0	50		
		55	5.0 (0.51)	22.0	24.7	27.5	27.5	27.5	27.5	27.5	27.5	55		
		60	4.6 (0.47)	24.0	27.0	30.0	30.0	30.0	30.0	30.0	30.0	60		
		65	4.2 (0.43)	26.0	29.2	32.5	32.5	32.5	32.5	32.5	32.5	65		
		70	3.9 (0.40)	28.0	31.5	35.0	35.0	35.0	35.0	35.0	35.0	70		
		75	3.7 (0.37)	30.0	33.7	37.5	37.5	37.5	37.5	37.5	37.5	75		
		80	3.4 (0.35)	32.0	36.0	40.0	40.0	40.0	40.0	40.0	40.0	80		
		90	3.1 (0.31)	36.0	40.5	45.0	45.0	45.0	45.0	45.0	45.0	90		
14	7	20	17.7 (1.80)	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	SWF14—20	Quotation	
		25	14.1 (1.44)	10.0	11.2	12.5	12.5	12.5	12.5	12.5	12.5	25		
		30	11.8 (1.20)	12.0	13.5	15.0	15.0	15.0	15.0	15.0	15.0	30		
		35	10.1 (1.03)	14.0	15.7	17.5	17.5	17.5	17.5	17.5	17.5	35		
		40	8.8 (0.90)	16.0	18.0	20.0	20.0	20.0	20.0	20.0	20.0	40		
		45	7.8 (0.80)	18.0	20.2	22.5	22.5	22.5	22.5	22.5	22.5	45		
		50	7.1 (0.72)	20.0	22.5	25.0	25.0	25.0	25.0	25.0	25.0	50		
		55	6.4 (0.65)	22.0	24.7	27.5	27.5	27.5	27.5	27.5	27.5	55		
		60	5.9 (0.60)	24.0	27.0	30.0	30.0	30.0	30.0	30.0	30.0	60		
		65	5.4 (0.55)	26.0	29.2	32.5	32.5	32.5	32.5	32.5	32.5	65		
		70	5.0 (0.51)	28.0	31.5	35.0	35.0	35.0	35.0	35.0	35.0	70		
		75	4.7 (0.48)	30.0	33.7	37.5	37.5	37.5	37.5	37.5	37.5	75		
		80	4.4 (0.45)	32.0	36.0	40.0	40.0	40.0	40.0	40.0	40.0	80		
		90	3.9 (0.40)	36.0	40.5	45.0	45.0	45.0	45.0	45.0	45.0	90		
		100	3.5 (0.36)	40.0	45.0	50.0	50.0	50.0	50.0	50.0	50.0	100		

D	d	L	Spring constant N/mm (kgf/mm)	F=L×40%			F=L×45%			F=L×50%			Catalog No.	Base unit price
				Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count		
16	8	20	20.6 (2.10)	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	SWF16—20	1~19 pieces	
		25	16.5 (1.68)	10.0	11.2	12.5	12.5	12.5	12.5	12.5	12.5	25		
		30	13.7 (1.40)	12.0	13.5	15.0	15.0	15.0	15.0	15.0	15.0	30		
		35	11.8 (1.20)	14.0	15.7	17.5	17.5	17.5	17.5	17.5	17.5	35		
		40	10.3 (1.05)	16.0	18.0	20.0	20.0	20.0	20.0	20.0	20.0	40		
		45	9.2 (0.93)	18.0	20.2	22.5	22.5	22.5	22.5	22.5	22.5	45		
		50	8.2 (0.84)	20.0	22.5	25.0	25.0	25.0	25.0	25.0	25.0	50		
		55	7.5 (0.76)	22.0	24.7	27.5	27.5	27.5	27.5	27.5	27.5	55		
		60	6.9 (0.70)	24.0	27.0	30.0	30.0	30.0	30.0	30.0	30.0	60		
		65	6.3 (0.65)	26.0	29.2	32.5	32.5	32.5	32.5	32.5	32.5	65		
		70	5.9 (0.60)	28.0	31.5	35.0	35.0	35.0	35.0	35.0	35.0	70		
		75	5.5 (0.56)	30.0	33.7	37.5	37.5	37.5	37.5	37.5	37.5	75		
		80	5.1 (0.53)	32.0	36.0	40.0	40.0	40.0	40.0	40.0	40.0	80		
		90	4.6 (0.47)	36.0	40.5	45.0	45.0	45.0	45.0	45.0	45.0	90		
		100	4.1 (0.42)	40.0	45.0	50.0	50.0	50.0	50.0	50.0	50.0	100		
125	3.3 (0.34)	50.0	56.3	62.5	62.5	62.5	62.5	62.5	62.5	125				
18	9	20	25.5 (2.60)	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	SWF18—20	Quotation	
		25	20.4 (2.08)	10.0	11.2	12.5	12.5	12.5	12.5	12.5	12.5	25		
		30	17.0 (1.73)	12.0	13.5	15.0	15.0	15.0	15.0	15.0	15.0	30		
		35	14.6 (1.49)	14.0	15.7	17.5	17.5	17.5	17.5	17.5	17.5	35		
		40	12.7 (1.30)	16.0	18.0	20.0	20.0	20.0	20.0	20.0	20.0	40		
		45	11.3 (1.16)	18.0	20.2	22.5	22.5	22.5	22.5	22.5	22.5	45		
		50	10.2 (1.04)	20.0	22.5	25.0	25.0	25.0	25.0	25.0	25.0	50		
		55	9.3 (0.95)	22.0	24.7	27.5	27.5	27.5	27.5	27.5	27.5	55		
		60	8.5 (0.87)	24.0	27.0	30.0	30.0	30.0	30.0	30.0	30.0	60		
		65	7.8 (0.80)	26.0	29.2	32.5	32.5	32.5	32.5	32.5	32.5	65		
		70	7.3 (0.74)	28.0	31.5	35.0	35.0	35.0	35.0	35.0	35.0	70		
		75	6.8 (0.69)	30.0	33.7	37.5	37.5	37.5	37.5	37.5	37.5	75		
		80	6.4 (0.65)	32.0	36.0	40.0	40.0	40.0	40.0	40.0	40.0	80		
		90	5.7 (0.58)	36.0	40.5	45.0	45.0	45.0	45.0	45.0	45.0	90		
		100	5.1 (0.52)	40.0	45.0	50.0	50.0	50.0	50.					

COIL SPRINGS

—SWL—

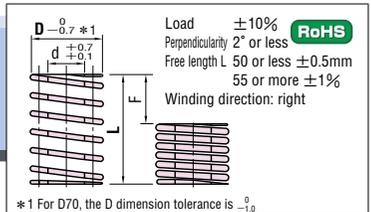
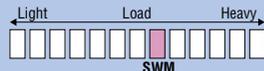


D	d	L	Spring constant			F=LX32%			F=LX36%			F=LX40%			Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm		
6	3	15	13.1 (1.33)	4.8	5.4	6.0	SWL6—15						1~19 pieces			
			20	9.8 (1.00)	6.4	7.2	8.0	20								
			25	7.8 (0.80)	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	SWL8—10						1~19 pieces			
			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	SWL10—10						1~19 pieces			
			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	12	34.3 (3.50)	4.8	5.4	6.0	SWL12—15						1~19 pieces			
			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	14	34.3 (3.50)	6.4	7.2	8.0	SWL14—20						1~19 pieces			
			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											

D	d	L	Spring constant			F=LX32%			F=LX36%			F=LX40%			Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm		
16	8	20	42.9 (4.38)	6.4	7.2	8.0	SWL16—20						1~19 pieces			
			25	34.3 (3.50)	8.0	9.0	10.0	25								
			30	28.6 (2.92)	9.6	10.8	12.0	30								
			35	24.5 (2.50)	11.2	12.6	14.0	35								
			40	21.5 (2.19)	12.8	14.4	16.0	40								
			45	19.1 (1.94)	14.4	16.2	18.0	45								
			50	17.2 (1.75)	16.0	18.0	20.0	50								
			55	15.6 (1.59)	17.6	19.8	22.0	55								
			60	14.3 (1.46)	19.2	21.6	24.0	60								
			65	13.2 (1.35)	20.8	23.4	26.0	65								
			70	12.3 (1.25)	22.4	25.2	28.0	70								
			75	11.4 (1.17)	24.0	27.0	30.0	75								
			80	10.7 (1.09)	25.6	28.8	32.0	80								
			90	9.5 (0.97)	28.8	32.4	36.0	90								
100	8.6 (0.88)	32.0	36.0	40.0	100											
125	6.9 (0.70)	40.0	45.0	50.0	125											
18	9	20	52.7 (5.38)	6.4	7.2	8.0	SWL18—20						1~19 pieces			
			25	42.2 (4.30)	8.0	9.0	10.0	25								
			30	35.1 (3.58)	9.6	10.8	12.0	30								
			35	30.1 (3.07)	11.2	12.6	14.0	35								
			40	26.4 (2.69)	12.8	14.4	16.0	40								
			45	23.4 (2.39)	14.4	16.2	18.0	45								
			50	21.1 (2.15)	16.0	18.0	20.0	50								
			55	19.2 (1.95)	17.6	19.8	22.0	55								
			60	17.6 (1.79)	19.2	21.6	24.0	60								
			65	16.2 (1.65)	20.8	23.4	26.0	65								
			70	15.1 (1.54)	22.4	25.2	28.0	70								
			75	14.1 (1.43)	24.0	27.0	30.0	75								
			80	13.2 (1.34)	25.6	28.8	32.0	80								
			90	11.7 (1.19)	28.8	32.4	36.0	90								
100	10.5 (1.08)	32.0	36.0	40.0	100											
125	8.4 (0.86)	40.0	45.0	50.0	125											
20	10	20	66.2 (6.75)	6.4	7.2	8.0	SWL20—20						1~19 pieces			
			25	53.0 (5.40)	8.0	9.0	10.0	25								
			30	44.1 (4.50)	9.6	10.8	12.0	30								
			35	37.8 (3.86)	11.2	12.6	14.0	35								
			40	33.1 (3.38)	12.8	14.4	16.0	40								
			45	29.4 (3.00)	14.4	16.2	18.0	45								
			50	26.5 (2.70)	16.0	18.0	20.0	50								
			55	24.1 (2.45)	17.6	19.8	22.0	55								
			60	22.1 (2.25)	19.2	21.6	24.0	60								
			65	20.4 (2.08)	20.8	23.4	26.0	65								
			70	18.9 (1.93)	22.4	25.2	28.0	70								
			75	17.7 (1.80)	24.0	27.0	30.0	75								
			80	16.5 (1.69)	25.6	28.8	32.0	80								
			90	14.7 (1.50)	28.8	32.4	36.0	90								
100	13.2 (1.35)	32.0	36.0	40.0	100											
125	10.6 (1.08)	40.0	45.0	50.0	125											
150	8.8 (0.90)	48.0	54.0	60.0	150											
22	11	22	65.7 (6.70)	8.0	9.0	10.0	SWL22—25						1~19 pieces			
			30	54.8 (5.58)	9.6	10.8	12.0	30								
			35	46.9 (4.79)	11.2	12.6	14.0	35								
			40	41.1 (4.19)	12.8	14.4	16.0	40								
			45	36.5 (3.72)	14.4	16.2	18.0	45								

COIL SPRINGS

—SWM—



D	d	L	Spring constant			Catalog No.	Base unit price	
			F=LX25.6%	F=LX28.8%	F=LX32%			
Operation count			1,000,000	500,000	300,000	Type D—L	1~19 pieces	
6	3	15	20.4 (2.08)	3.8	4.3	4.8	SWM6—15	
		20	15.3 (1.56)	5.1	5.8	6.4	20	
		25	12.3 (1.25)	6.4	7.2	8.0	25	
		30	10.2 (1.04)	7.7	8.6	9.6	30	
		35	8.8 (0.89)	9.0	10.1	11.2	35	
		40	7.7 (0.78)	10.2	11.5	12.8	40	
		45	6.8 (0.69)	11.5	13.0	14.4	45	
		50	6.1 (0.63)	12.8	14.4	16.0	50	
		55	5.6 (0.57)	14.1	15.8	17.6	55	
		60	5.1 (0.52)	15.4	17.3	19.2	60	
8	4	10	42.9 (4.37)	2.6	2.9	3.2	SWM8—10	
		15	28.6 (2.91)	3.8	4.3	4.8	15	
		20	21.5 (2.18)	5.1	5.8	6.4	20	
		25	17.2 (1.75)	6.4	7.2	8.0	25	
		30	14.3 (1.46)	7.7	8.6	9.6	30	
		35	12.2 (1.25)	9.0	10.1	11.2	35	
		40	10.7 (1.09)	10.2	11.5	12.8	40	
		45	9.5 (0.97)	11.5	13.0	14.4	45	
		50	8.6 (0.87)	12.8	14.4	16.0	50	
		55	7.8 (0.79)	14.1	15.8	17.6	55	
10	5	10	61.3 (6.25)	2.6	2.9	3.2	SWM10—10	
		15	40.9 (4.17)	3.8	4.3	4.8	15	
		20	30.6 (3.13)	5.1	5.8	6.4	20	
		25	24.5 (2.50)	6.4	7.2	8.0	25	
		30	20.4 (2.08)	7.7	8.6	9.6	30	
		35	17.5 (1.79)	9.0	10.1	11.2	35	
		40	15.3 (1.56)	10.2	11.5	12.8	40	
		45	13.6 (1.39)	11.5	13.0	14.4	45	
		50	12.3 (1.25)	12.8	14.4	16.0	50	
		55	11.1 (1.14)	14.1	15.8	17.6	55	
12	6	10	59.2 (6.04)	3.8	4.3	4.8	SWM12—15	
		15	44.4 (4.53)	5.1	5.8	6.4	20	
		20	35.5 (3.63)	6.4	7.2	8.0	25	
		25	30.9 (3.02)	7.7	8.6	9.6	30	
		30	25.4 (2.59)	9.0	10.1	11.2	35	
		35	22.2 (2.27)	10.2	11.5	12.8	40	
		40	19.7 (2.01)	11.5	13.0	14.4	45	
		45	17.8 (1.81)	12.8	14.4	16.0	50	
		50	16.2 (1.65)	14.1	15.8	17.6	55	
		55	14.8 (1.51)	15.4	17.3	19.2	60	
14	7	10	59.8 (6.09)	5.1	5.8	6.4	SWM14—20	
		15	47.9 (4.88)	6.4	7.2	8.0	25	
		20	39.9 (4.08)	7.7	8.6	9.6	30	
		25	34.2 (3.48)	9.0	10.1	11.2	35	
		30	29.9 (3.05)	10.2	11.5	12.8	40	
		35	26.6 (2.71)	11.5	13.0	14.4	45	
		40	23.9 (2.44)	12.8	14.4	16.0	50	
		45	21.8 (2.22)	14.1	15.8	17.6	55	
		50	19.9 (2.03)	15.4	17.3	19.2	60	
		55	18.4 (1.88)	16.6	18.7	20.8	65	

D	d	L	Spring constant			Catalog No.	Base unit price	
			F=LX25.6%	F=LX28.8%	F=LX32%			
Operation count			1,000,000	500,000	300,000	Type D—L	1~19 pieces	
16	8	20	78.1 (7.97)	5.1	5.8	6.4	SWM16—20	
		25	62.5 (6.38)	6.4	7.2	8.0	25	
		30	52.1 (5.31)	7.7	8.6	9.6	30	
		35	44.7 (4.55)	9.0	10.1	11.2	35	
		40	39.1 (3.98)	10.2	11.5	12.8	40	
		45	34.7 (3.54)	11.5	13.0	14.4	45	
		50	31.3 (3.19)	12.8	14.4	16.0	50	
		55	28.4 (2.90)	14.1	15.8	17.6	55	
		60	26.0 (2.66)	15.4	17.3	19.2	60	
		65	24.0 (2.45)	16.6	18.7	20.8	65	
18	9	20	99.6 (10.2)	5.1	5.8	6.4	SWM18—20	
		25	79.7 (8.13)	6.4	7.2	8.0	25	
		30	66.4 (6.77)	7.7	8.6	9.6	30	
		35	56.9 (5.80)	9.0	10.1	11.2	35	
		40	49.8 (5.08)	10.2	11.5	12.8	40	
		45	44.3 (4.51)	11.5	13.0	14.4	45	
		50	39.8 (4.06)	12.8	14.4	16.0	50	
		55	36.2 (3.69)	14.1	15.8	17.6	55	
		60	33.2 (3.39)	15.4	17.3	19.2	60	
		65	30.6 (3.13)	16.6	18.7	20.8	65	
20	10	20	123 (12.5)	5.1	5.8	6.4	SWM20—20	
		25	98.0 (10.0)	6.4	7.2	8.0	25	
		30	81.7 (8.33)	7.7	8.6	9.6	30	
		35	70.0 (7.14)	9.0	10.1	11.2	35	
		40	61.3 (6.25)	10.2	11.5	12.8	40	
		45	54.4 (5.55)	11.5	13.0	14.4	45	
		50	49.0 (5.00)	12.8	14.4	16.0	50	
		55	44.5 (4.55)	14.1	15.8	17.6	55	
		60	40.8 (4.17)	15.4	17.3	19.2	60	
		65	37.7 (3.85)	16.6	18.7	20.8	65	
22	11	20	119 (12.1)	6.4	7.2	8.0	SWM22—25	
		25	99.1 (10.1)	7.7	8.6	9.6	30	
		30	84.9 (8.66)	9.0	10.1	11.2	35	
		35	74.3 (7.58)	10.2	11.5	12.8	40	
		40	66.1 (6.74)	11.5	13.0	14.4	45	
		45	59.5 (6.06)	12.8	14.4	16.0	50	
		50	54.0 (5.51)	14.1	15.8	17.6	55	
		55	49.5 (5.05)	15.4	17.3	19.2	60	
		60	45.7 (4.66)	16.6	18.7	20.8	65	
		65	42.5 (4.33)	17.9	20.2	22.4	70	

Order

Days to Ship

Price

D	d	L	Spring constant			Catalog No.	Base unit price	
			F=LX25.6%	F=LX28.8%	F=LX32%			
Operation count			1,000,000	500,000	300,000	Type D—L	1~19 pieces	
25	12.5	25	153 (15.6)	6.4	7.2	8.0	SWM25—25	
		30	128 (13.0)	7.7	8.6	9.6	30	
		35	109 (11.2)	9.0	10.1	11.2	35	
		40	95.7 (9.77)	10.2	11.5	12.8	40	
		45	85.1 (8.68)	11.5	13.0	14.4	45	
		50	76.6 (7.81)	12.8	14.4	16.0	50	
		55	69.6 (7.10)	14.1	15.8	17.6	55	
		60	63.8 (6.51)	15.4	17.3	19.2	60	
		65	58.9 (6.01)	16.6	18.7	20.8	65	
		70	54.7 (5.58)	17.9	20.2	22.4	70	
27	13.5	25	179 (18.3)	6.4	7.2	8.0	SWM27—25	
		30	149 (15.2)	7.7	8.6	9.6	30	
		35	128 (13.0)	9.0	10.1	11.2	35	
		40	112 (11.4)	10.2	11.5	12.8	40	
		45	99.4 (10.1)	11.5	13.0	14.4	45	
		50	89.4 (9.13)	12.8	14.4	16.0	50	
		55	81.3 (8.30)	14.1	15.8	17.6	55	
		60	74.5 (7.60)	15.4	17.3	19.2	60	
		65	68.8 (7.02)	16.6	18.7	20.8	65	
		70	63.9 (6.52)	17.9	20.2	22.4	70	
30	15	25	221 (22.5)	6.4	7.2	8.0	SWM30—25	
		30	184 (18.8)	7.7	8.6	9.6	30	
		35	158 (16.1)	9.0	10.1	11.2	35	
		40	138 (14.1)	10.2	11.5	12.8	40	
		45	123 (12.5)	11.5	13.0	14.4	45	
		50	110 (11.3)	12.8	14.4	16.0	50	
		55	100 (10.2)	14.1	15.8	17.6	55	
		60	91.9 (9.38)	15.4	17.3	19.2	60	
		65	84.9 (8.65)	16.6	18.7	20.8	65	
		70	78.8 (8.04)	17.9	20.2	22.4	70	
35	17.5	25	281 (28.5)	6.4	7.2	8.0	SWM35—40	
		30	228 (23.2)	7.7	8.6	9.6	30	
		35	192 (19.6)	9.0	10.1	11.2	35	
		40	165 (16.8)	10.2	11.5	12.8	40	
		45	144 (14.7)	11.5	13.0	14.4	45	
		50	128 (13.0)	12.8	14.4	16.0	50	
		55	116 (11.8)	14.1	15.8	17.6	55	
		60	107 (10.9)	15.4	17.3	19.2	60	
		65	100 (10.2)	16.6	18.7	20.8	65	
		70	93.8 (9.57)	17.9	20.2	22.4	70	

Alterations

Coating removal

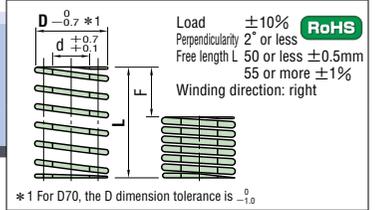
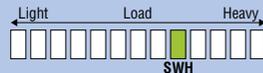
• Load calculation method: Load=Spring constant×Deflection
 (SI unit) N=N/mm×Fmm
 kgf=kgf/mm×Fmm
 (kgf=N×0.101972)

• Product guide • Load graph
 • Instructions and precautions for the use of coil springs
 • Clearance of D dim. and counterbore hole, and of d dim. and shaft

D	d	L	Spring constant			Catalog No.	Base unit price	
			F=LX25.6%	F=LX28.8%	F=LX32%			
Operation count			1,000,000	500,000	300,000	Type D—L	1~19 pieces	
40	20	40	245 (25.0)	10.2	11.5	12.8	SWM40—40	
		45	218 (22.2)	11.5	13.0	14.4	45	
		50	196 (20.0)	12.8	14.4	16.0	50	
		55	178 (18.2)	14.1	15.8	17.6	55	
		60	163 (16.7)	15.4	17.3	19.2	60	
		65	151 (15.4)	16.6	18.7	20.8	65	
		70	140 (14.3)	17.9	20.2	22.4	70	
		75	131 (13.3)	19.2	21.6	24.0	75	
		80	123 (12.5)	20.5	23.0	25.6	80	
		90	109 (11.1)	23.0	25.9	28.8	90	
50	25	40	306 (31.2)	12.8	14.4	16.0	SWM50—50	
		45	278 (28.4)	14.1	15.8	17.6	45	
		50	255 (26.0)	15.4	17.3	19.2	50	
		55	236 (24.0)	16.6	18.7	20.8	55	
		60	219 (22.3)	17.9	20.2	22.4	60	</

COIL SPRINGS

—SWH—



D	d	L	Spring constant N/mm (kgf/mm)	F=LX19.2%			F=LX21.6%			F=LX24%			Catalog No.	Base unit price
				Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count		
6	3	15	38.1 (3.9)	2.9	3.2	3.6	110	123	137	SWH6—15			1~19 pieces	
		20	28.5 (2.9)	3.8	4.3	4.8				25				
		25	22.8 (2.3)	4.8	5.4	6.0				30				
		30	19.0 (1.9)	5.8	6.5	7.2				35				
		35	16.3 (1.7)	6.7	7.6	8.4				40				
		40	14.3 (1.5)	7.7	8.6	9.6				45				
		45	12.7 (1.3)	8.6	9.7	10.8				50				
		50	11.4 (1.2)	9.6	10.8	12.0				55				
		55	10.4 (1.1)	10.6	11.9	13.2				60				
		60	9.5 (1.0)	11.5	13.0	14.4				65				
8	4	10	85.8 (8.8)	1.9	2.2	2.4	165	185	206	SWH8—10			1~19 pieces	
		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	11.9	13.2				55				
10	5	10	123 (12.5)	1.9	2.2	2.4	235	265	294	SWH10—10			Quotation	
		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	11.9	13.2				55				
12	6	10	204 (2.1)	11.5	13.0	14.4	337	379	421	SWH12—15			1~19 pieces	
		15	117 (11.9)	2.9	3.2	3.6				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	11.9	13.2				55				
14	7	10	292 (3.0)	11.5	13.0	14.4	462	520	578	SWH14—20			1~19 pieces	
		15	117 (11.9)	2.9	3.2	3.6				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	11.9	13.2				55				

D	d	L	Spring constant N/mm (kgf/mm)	F=LX19.2%			F=LX21.6%			F=LX24%			Catalog No.	Base unit price
				Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count		
16	8	20	157 (16.0)	3.8	4.3	4.8	604	680	755	SWH16—20			1~19 pieces	
		25	126 (12.8)	4.8	5.4	6.0				25				
		30	105 (10.7)	5.8	6.5	7.2				30				
		35	89.9 (9.2)	6.7	7.5	8.4				35				
		40	78.6 (8.0)	7.7	8.6	9.6				40				
		45	69.9 (7.1)	8.6	9.7	10.8				45				
		50	62.9 (6.4)	9.6	10.8	12.0				50				
		55	57.2 (5.8)	10.6	11.8	13.2				55				
		60	52.4 (5.3)	11.5	13.0	14.4				60				
		65	48.4 (4.9)	12.5	14.0	15.6				65				
18	9	20	198 (20.2)	3.8	4.3	4.8	761	856	951	SWH18—20			1~19 pieces	
		25	159 (16.2)	4.8	5.4	6.0				25				
		30	132 (13.5)	5.8	6.5	7.2				30				
		35	113 (11.5)	6.7	7.5	8.4				35				
		40	99.1 (10.1)	7.7	8.6	9.6				40				
		45	88.1 (9.0)	8.6	9.7	10.8				45				
		50	79.3 (8.1)	9.6	10.8	12.0				50				
		55	72.0 (7.3)	10.6	11.8	13.2				55				
		60	66.0 (6.7)	11.5	13.0	14.4				60				
		65	61.0 (6.2)	12.5	14.0	15.6				65				
20	10	20	245 (25.0)	3.8	4.3	4.8	941	1058	1176	SWH20—20			Quotation	
		25	196 (20.0)	4.8	5.4	6.0				25				
		30	163 (16.7)	5.8	6.5	7.2				30				
		35	140 (14.3)	6.7	7.5	8.4				35				
		40	123 (12.5)	7.7	8.6	9.6				40				
		45	109 (11.1)	8.6	9.7	10.8				45				
		50	98.0 (10.0)	9.6	10.8	12.0				50				
		55	89.1 (9.1)	10.6	11.8	13.2				55				
		60	81.7 (8.3)	11.5	13.0	14.4				60				
		65	75.4 (7.7)	12.5	14.0	15.6				65				
22	11	20	327 (3.3)	28.8	32.4	36.0	1137	1279	1421	SWH22—25			1~19 pieces	
		25	237 (24.2)	4.8	5.4	6.0				25				
		30	197 (20.1)	5.8	6.5	7.2				30				
		35	169 (17.3)	6.7	7.6	8.4				35				
		40	148 (15.1)	7.7	8.6	9.6				40				
		45	132 (13.4)	8.6	9.7	10.8				45				
		50	118 (12.1)	9.6	10.8	12.0				50				
		55	108 (11.0)	10.6	11.9	13.2				55				
		60	98.7 (10.1)	11.5	13.0	14.4				60				
		65	91.1 (9.3)	12.5	14.0	15.6				65				

Order
SWH 20—30

Days to Ship

Price

D	d	L	Spring constant N/mm (kgf/mm)	F=LX19.2%			F=LX21.6%			F=LX24%			Catalog No.	Base unit price
				Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count		
25	12.5	25	306 (31.2)	4.8	5.4	6.0	1466	1650	1833	SWH25—25			1~19 pieces	
		30	255 (26.0)	5.8	6.5	7.2				30				
		35	218 (22.3)	6.7	7.6	8.4				35				
		40	191 (19.5)	7.7	8.6	9.6				40				
		45	170 (17.3)	8.6	9.7	10.8				45				
		50	153 (15.6)	9.6	10.8	12.0				50				
		55	139 (14.2)	10.6	11.9	13.2				55				
		60	127 (13.0)	11.5	13.0	14.4				60				
		65	118 (12.0)	12.5	14.0	15.6				65				
		70	109 (11.1)	13.4	15.1	16.8				70				
27	13.5	25	358 (36.5)	4.8	5.4	6.0	1717	1931	2146	SWH27—25			1~19 pieces	
		30	298 (30.4)	5.8	6.5	7.2				30				
		35	255 (26.1)	6.7	7.6	8.4				35				
		40	224 (22.8)	7.7	8.6	9.6				40				
		45	199 (20.3)	8.6	9.7	10.8				45				
		50	179 (18.2)	9.6	10.8	12.0				50				
		55	163 (16.6)	10.6	11.9	13.2				55				
		60	149 (15.2)	11.5	13.0	14.4				60				
		65	138 (14.0)	12.5	14.0	15.6				65				
		70	128 (13.0)	13.4	15.1	16.8				70				
30	15	25	441 (45.0)	4.8	5.4	6.0	2117	2381	2646	SWH30—25			1~19 pieces	
		30	368 (37.5)	5.8	6.5	7.2				30				
		35	315 (32.1)	6.7	7.6	8.4				35				
		40	276 (28.1)	7.7	8.6	9.6				40				
		45	245 (25.0)	8.6	9.7	10.8				45				
		50	221 (22.5)	9.6	10.8	12.0				50				
		55	200 (20.4)	10.6	11.9	13.2				55				
		60	184 (18.7)	11.5	13.0	14.4				60				
		65	170 (17.3)	12.5	14.0	15.6				65				
		70	158 (16.1)	13.4	15.1	16.8				70				
35	17.5	25	596 (6.1)	28.8	32.4	36.0	2878	3237	3597	SWH35—40			1~19 pieces	
		30	511 (5.2)	33.6	37.8	42.0				30				
		35	441 (45.0)	4.8	5.4	6.0				35				
		40	368 (37.5)	5.8	6.5	7.2				40				
		45	315 (32.1)	6.7	7.6	8.4				45				
		50	276 (28.1)	7.7	8.6	9.6				50				
		55	245 (25.0)	8.6	9.7	10.8				55				
		60	221 (22.5)	9.6	10.8	12.0				60				
		65	200 (20.4)	10.6	11.9	13.2				65				
		70	184 (18.7)	11.5	13.0	14.4				70				

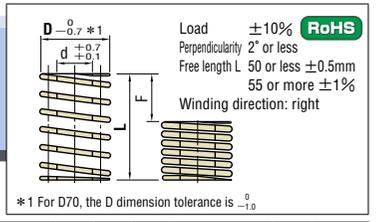
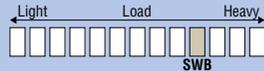
● Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

● Product guide P.1396 ● Load graph P.1432
● Instructions and precautions for the use of coil springs P.1397
● Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

D	d	L	Spring constant N/mm (kgf/mm)	F=LX19.2%			F=LX21.6%			F=LX24%			Catalog No.	Base unit price
				Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count	Fmm	Load N (kgf)	Operation count		
40	20	40	490 (50.0)	7.7	8.6	9.6	3763	4234	4704	SWH40—40			1~19 pieces	
		45	436 (44.4)	8.6	9.7	10.8				45				
		50	392 (40.0)	9.6	10.8	12.0				50				
		55	356 (36.3)	10.6	11.9	13.2				55				
		60	327 (33.3)	11.5	13.0	14.4				60				
		65	302 (30.7)	12.5	14.0	15.6				65				
		70	280 (28.6)	13.4	15.1	16.8				70				
		75	261 (26.6)	14.4	16.2	18.0				75				
		80	245 (25.0)	15.4	17.3	19.2				80				
		90	218 (22.2)	17.3	19.4	21.6				90				
50	25	50	613 (62.5)	9.6	10.8	12.0	5880	6615	7350	SWH50—50			1~19 pieces	
		55	557 (56.8)	10.6	11.9	13.2				55				
		60	510 (52.0)	11.5	13.0	14.4				60				
		65	471 (48.0)	12.5	14.0	15.6				65				
		70	438 (44.6)	13.4	15.1	16.8				70				
		75	408 (41.											

COIL SPRINGS

—SWB—

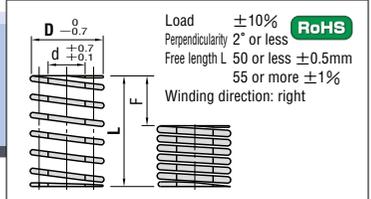
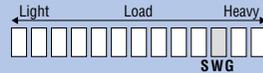


D	d	L	Spring constant			F=LX16%			F=LX18%			F=LX20%			Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm		
6	3	15	59.0	6.0	2.4	2.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	SWB6—15	1~19 pieces
			20	44.3	4.5	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	25	
			25	35.4	3.6	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	30	
			30	29.5	3.0	4.8	5.4	6.0	6.0	6.0	6.0	6.0	6.0	6.0	35	
			35	25.3	2.6	5.6	6.3	7.0	7.0	7.0	7.0	7.0	7.0	7.0	40	
			40	22.1	2.3	6.4	7.2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	45	
			45	19.7	2.0	7.2	8.1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	50	
			50	17.7	1.8	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	55	
			55	16.1	1.6	8.8	9.9	11.0	11.0	11.0	11.0	11.0	11.0	11.0	60	
			60	14.8	1.5	9.6	10.8	12.0	12.0	12.0	12.0	12.0	12.0	12.0	60	
8	4	10	162	16.5	1.6	1.8	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	SWB8—10	1~19 pieces
			15	108	11.0	2.4	2.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	15	
			20	80.8	8.2	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	20	
			25	64.6	6.6	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	25		
			30	53.8	5.5	4.8	5.4	6.0	6.0	6.0	6.0	6.0	6.0	30		
			35	46.1	4.7	5.6	6.3	7.0	7.0	7.0	7.0	7.0	7.0	35		
			40	40.4	4.1	6.4	7.2	8.0	8.0	8.0	8.0	8.0	8.0	40		
			45	35.9	3.7	7.2	8.1	9.0	9.0	9.0	9.0	9.0	9.0	45		
			50	32.3	3.3	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	50		
			55	29.4	3.0	8.8	9.9	11.0	11.0	11.0	11.0	11.0	11.0	55		
10	5	15	221	22.5	1.6	1.8	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	SWB10—10	Quotation
			15	147	15.0	2.4	2.7	3.0	3.0	3.0	3.0	3.0	3.0	3.0	15	
			20	110	11.2	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0	20		
			25	88.2	9.0	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	25		
			30	73.5	7.5	4.8	5.4	6.0	6.0	6.0	6.0	6.0	6.0	30		
			35	63.0	6.4	5.6	6.3	7.0	7.0	7.0	7.0	7.0	7.0	35		
			40	55.1	5.6	6.4	7.2	8.0	8.0	8.0	8.0	8.0	8.0	40		
			45	49.0	5.0	7.2	8.1	9.0	9.0	9.0	9.0	9.0	9.0	45		
			50	44.1	4.5	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	50		
			55	40.1	4.1	8.8	9.9	11.0	11.0	11.0	11.0	11.0	11.0	55		
12	6	20	142	14.5	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	20	1~19 pieces	
			25	114	11.6	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	25		
			30	94.8	9.7	4.8	5.4	6.0	6.0	6.0	6.0	6.0	6.0	30		
			35	81.3	8.3	5.6	6.3	7.0	7.0	7.0	7.0	7.0	7.0	35		
			40	71.1	7.3	6.4	7.2	8.0	8.0	8.0	8.0	8.0	8.0	40		
			45	63.2	6.4	7.2	8.1	9.0	9.0	9.0	9.0	9.0	9.0	45		
			50	56.9	5.8	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	50		
			55	51.7	5.3	8.8	9.9	11.0	11.0	11.0	11.0	11.0	11.0	55		
			60	47.4	4.8	9.6	10.8	12.0	12.0	12.0	12.0	12.0	12.0	60		
			65	43.8	4.5	10.4	11.7	13.0	13.0	13.0	13.0	13.0	13.0	65		
14	7	30	123	12.5	4.8	5.4	6.0	6.0	6.0	6.0	6.0	6.0	6.0	30	1~19 pieces	
			35	105	10.7	5.6	6.3	7.0	7.0	7.0	7.0	7.0	7.0	35		
			40	92.0	9.4	6.4	7.2	8.0	8.0	8.0	8.0	8.0	8.0	40		
			45	81.8	8.3	7.2	8.1	9.0	9.0	9.0	9.0	9.0	9.0	45		
			50	73.6	7.5	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	50		
			55	66.9	6.8	8.8	9.9	11.0	11.0	11.0	11.0	11.0	11.0	55		
			60	61.3	6.3	9.6	10.8	12.0	12.0	12.0	12.0	12.0	12.0	60		
			65	56.6	5.8	10.4	11.7	13.0	13.0	13.0	13.0	13.0	13.0	65		
			70	52.6	5.4	11.2	12.6	14.0	14.0	14.0	14.0	14.0	14.0	70		
			75	49.1	5.0	12.0	13.5	15.0	15.0	15.0	15.0	15.0	15.0	75		
16	8	40	106	10.6	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	40	1~19 pieces	
			110	11.0	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	45		
			115	11.5	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	50		
			120	12.0	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	55		
			125	12.5	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	60		
			130	13.0	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	65		
			135	13.5	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	70		
			140	14.0	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	75		
			145	14.5	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	80		
			150	15.0	16.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	85		

D	d	L	Spring constant			F=LX16%			F=LX18%			F=LX20%			Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm	Load N (kgf)	Fmm		
16	8	20	245	25.0	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	SWB16—20	1~19 pieces
			25	196	20.0	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	25	
			30	163	16.7	4.8	5.4	6.0	6.0	6.0	6.0	6.0	6.0	6.0	30	
			35	140	14.3	5.6	6.3	7.0	7.0	7.0	7.0	7.0	7.0	7.0	35	
			40	123	12.5	6.4	7.2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	40	
			45	109	11.1	7.2	8.1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	45	
			50	98.0	10.0	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	50	
			55	89.1	9.1	8.8	9.9	11.0	11.0	11.0	11.0	11.0	11.0	11.0	55	
			60	81.7	8.3	9.6	10.8	12.0	12.0	12.0	12.0	12.0	12.0	12.0	60	
			65	75.4	7.7	10.4	11.7	13.0	13.0	13.0	13.0	13.0	13.0	13.0	65	
18	9	20	306	31.2	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	SWB18—20	Quotation
			25	245	25.0	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	25	
			30	204	20.8	4.8	5.4	6.0	6.0	6.0	6.0	6.0	6.0	6.0	30	
			35	175	17.8	5.6	6.3	7.0	7.0	7.0	7.0	7.0	7.0	7.0	35	
			40	153	15.6	6.4	7.2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	40	
			45	136	13.9	7.2	8.1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	45	
			50	123	12.5	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	50	
			55	111	11.4	8.8	9.9	11.0	11.0	11.0	11.0	11.0	11.0	11.0	55	
			60	102	10.4	9.6	10.8	12.0	12.0	12.0	12.0	12.0	12.0	12.0	60	
			65	94.2	9.6	10.4	11.7	13.0	13.0	13.0	13.0	13.0	13.0	13.0	65	
20	10	20	392	40.0	3.2	3.6	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	SWB20—20	Quotation
			25	314	32.0	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0	25	
			30	261	26.6	4.8	5.4	6.0	6.0	6.0	6.0	6.0	6.0	6.0	30	
			35	224	22.8	5.6	6.3	7.0	7.0	7.0	7.0	7.0	7.0	7.0	35	
			40	196	20.0	6.4	7.2	8.0	8.0	8.0	8.0	8.0	8.0	8.0	40	
			45	174	17.8	7.2	8.1	9.0	9.0	9.0	9.0	9.0	9.0	9.0	45	
			50	157	16.0	8.0	9.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	50	
			55	143	14.5	8.8	9.9	11.0	11.0	11.0	11.0	11.0	11.0	11.0	55	
			60	131	13.3	9.6	10.8	12.0	12.0	12.0	12.0	12.0	12.0	12.0	60	
			65	121	12.3	10.4	11.7	13.0	13.0	13.0	13.0	13.0	13.0	13.0	65	
22	11	20	382	39.0												

COIL SPRINGS

—SWG—



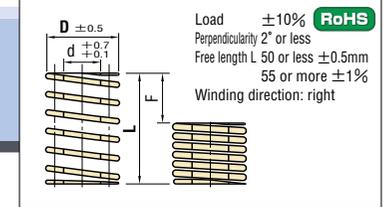
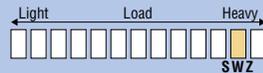
D	d	L	Spring constant			Catalog No.	Base unit price	
			N/mm (kgf/mm)	Fmm	Load N (kgf)			
Operation count			F=LX16%	F=LX18%	F=LX20%	Type D-L	1~19 pieces	
			1,000,000	500,000	300,000			
10	5	15	163 (16.7)	2.4	2.7	Out of range	SWG10-15	
		20	123 (12.5)	3.2	3.6	4.0	20	
		25	98.1 (10.0)	4.0	4.5	5.0	25	
		30	81.7 (8.3)	4.8	5.4	6.0	30	
		35	70.0 (7.1)	5.6	6.3	7.0	35	
		40	61.3 (6.3)	6.4	7.2	8.0	40	
		45	54.5 (5.6)	7.2	8.1	9.0	45	
		50	49.0 (5)	8.0	392 (40)	441 (45)	50	490
		55	44.6 (4.5)	8.8	9.9	11.0	55	
		60	40.9 (4.2)	9.6	10.8	12.0	60	
		65	37.7 (3.8)	10.4	11.7	13.0	65	
		70	35.0 (3.6)	11.2	12.6	14.0	70	
		75	32.7 (3.3)	12.0	13.5	15.0	75	
		80	30.6 (3.1)	12.8	14.4	16.0	80	
		90	27.2 (2.8)	14.4	16.2	18.0	90	
100	24.5 (2.5)	16.0	18.0	20.0	100			
12	6	15	245 (25.0)	2.4	2.7	Out of range	SWG12-15	
		20	184 (18.8)	3.2	3.6	4.0	20	
		25	147 (15.0)	4.0	4.5	5.0	25	
		30	123 (12.5)	4.8	5.4	6.0	30	
		35	105 (10.7)	5.6	6.3	7.0	35	
		40	91.9 (9.4)	6.4	7.2	8.0	40	
		45	81.7 (8.3)	7.2	8.1	9.0	45	
		50	73.5 (7.5)	8.0	588 (60)	662 (68)	50	735
		55	66.9 (6.8)	8.8	9.9	11.0	55	
		60	61.3 (6.3)	9.6	10.8	12.0	60	
		65	56.6 (5.8)	10.4	11.7	13.0	65	
		70	52.5 (5.4)	11.2	12.6	14.0	70	
		75	49.0 (5.0)	12.0	13.5	15.0	75	
		80	46.0 (4.7)	12.8	14.4	16.0	80	
		90	40.9 (4.2)	14.4	16.2	18.0	90	
100	36.8 (3.8)	16.0	18.0	20.0	100			
14	7	20	238 (24.3)	3.2	3.6	Out of range	SWG14-20	
		25	190 (19.4)	4.0	4.5	5.0	25	
		30	159 (16.2)	4.8	5.4	6.0	30	
		35	136 (13.9)	5.6	6.3	7.0	35	
		40	119 (12.1)	6.4	7.2	8.0	40	
		45	106 (10.8)	7.2	8.1	9.0	45	
		50	95.1 (9.7)	8.0	761 (78)	856 (87)	50	951
		55	86.5 (8.8)	8.8	9.9	11.0	55	
		60	79.3 (8.1)	9.6	10.8	12.0	60	
		65	73.2 (7.5)	10.4	11.7	13.0	65	
		70	67.9 (6.9)	11.2	12.6	14.0	70	
		75	63.4 (6.5)	12.0	13.5	15.0	75	
		80	59.5 (6.1)	12.8	14.4	16.0	80	
		90	52.8 (5.4)	14.4	16.2	18.0	90	
		100	47.6 (4.9)	16.0	18.0	20.0	100	
16	8	20	319 (32.5)	3.2	3.6	Out of range	SWG16-20	
		25	255 (26.0)	4.0	4.5	5.0	25	
		30	212 (21.7)	4.8	5.4	6.0	30	
		35	182 (18.6)	5.6	6.3	7.0	35	
		40	159 (16.3)	6.4	7.2	8.0	40	
		45	142 (14.4)	7.2	8.1	9.0	45	
		50	127 (13.0)	8.0	1020 (104)	1147 (117)	50	1275
		55	116 (11.8)	8.8	9.9	11.0	55	
		60	106 (10.8)	9.6	10.8	12.0	60	
		65	98.1 (10.0)	10.4	11.7	13.0	65	
		70	91.1 (9.3)	11.2	12.6	14.0	70	
		75	85.0 (8.7)	12.0	13.5	15.0	75	
		80	79.7 (8.1)	12.8	14.4	16.0	80	
		90	70.8 (7.2)	14.4	16.2	18.0	90	
		100	63.7 (6.5)	16.0	18.0	20.0	100	

D	d	L	Spring constant			Catalog No.	Base unit price	
			N/mm (kgf/mm)	Fmm	Load N (kgf)			
Operation count			F=LX16%	F=LX18%	F=LX20%	Type D-L	1~19 pieces	
			1,000,000	500,000	300,000			
18	9	20	392 (40.0)	3.2	3.6	Out of range	SWG18-20	
		25	314 (32.0)	4.0	4.5	5.0	25	
		30	262 (26.7)	4.8	5.4	6.0	30	
		35	224 (22.9)	5.6	6.3	7.0	35	
		40	196 (20.0)	6.4	7.2	8.0	40	
		45	174 (17.8)	7.2	8.1	9.0	45	
		50	157 (16.0)	8.0	9.0	10.0	50	1569
		55	143 (14.5)	8.8	9.9	11.0	55	
		60	131 (13.3)	9.6	10.8	12.0	60	
		65	121 (12.3)	10.4	11.7	13.0	65	
		70	112 (11.4)	11.2	12.6	14.0	70	
		75	105 (10.7)	12.0	13.5	15.0	75	
		80	98.1 (10.0)	12.8	14.4	16.0	80	
		90	87.2 (8.9)	14.4	16.2	18.0	90	
		100	78.5 (8.0)	16.0	18.0	20.0	100	
20	10	20	515 (52.5)	3.2	3.6	Out of range	SWG20-20	
		25	412 (42.0)	4.0	4.5	5.0	25	
		30	343 (35.0)	4.8	5.4	6.0	30	
		35	294 (30.0)	5.6	6.3	7.0	35	
		40	257 (26.3)	6.4	7.2	8.0	40	
		45	229 (23.3)	7.2	8.1	9.0	45	
		50	206 (21.0)	8.0	9.0	10.0	50	
		55	187 (19.1)	8.8	9.9	11.0	55	2059
		60	172 (17.5)	9.6	10.8	12.0	60	
		65	158 (16.2)	10.4	11.7	13.0	65	
		70	147 (15.0)	11.2	12.6	14.0	70	
		75	137 (14.0)	12.0	13.5	15.0	75	
		80	129 (13.1)	12.8	14.4	16.0	80	
		90	114 (11.7)	14.4	16.2	18.0	90	
		100	103 (10.5)	16.0	18.0	20.0	100	
125	82.4 (8.4)	20.0	22.5	25.0	125			
22	11	20	588 (60.0)	3.2	3.6	Out of range	SWG22-20	
		25	471 (48.0)	4.0	4.5	5.0	25	
		30	392 (40.0)	4.8	5.4	6.0	30	
		35	336 (34.3)	5.6	6.3	7.0	35	
		40	294 (30.0)	6.4	7.2	8.0	40	
		45	262 (26.7)	7.2	8.1	9.0	45	
		50	235 (24.0)	8.0	9.0	10.0	50	
		55	214 (21.8)	8.8	9.9	11.0	55	2354
		60	196 (20.0)	9.6	10.8	12.0	60	
		65	181 (18.5)	10.4	11.7	13.0	65	
		70	168 (17.1)	11.2	12.6	14.0	70	
		75	157 (16.0)	12.0	13.5	15.0	75	
		80	147 (15.0)	12.8	14.4	16.0	80	
		90	131 (13.3)	14.4	16.2	18.0	90	
		100	118 (12.0)	16.0	18.0	20.0	100	
125	94.1 (9.6)	20.0	22.5	25.0	125			
25	12.5	20	760 (77.5)	3.2	3.6	Out of range	SWG25-20	
		25	608 (62.0)	4.0	4.5	5.0	25	
		30	507 (51.7)	4.8	5.4	6.0	30	
		35	434 (44.3)	5.6	6.3	7.0	35	
		40	380 (38.8)	6.4	7.2	8.0	40	
		45	338 (34.4)	7.2	8.1	9.0	45	
		50	304 (31.0)	8.0	9.0	10.0	50	
		55	276 (28.2)	8.8	9.9	11.0	55	3040
		60	253 (25.8)	9.6	10.8	12.0	60	
		65	234 (23.8)	10.4	11.7	13.0	65	
		70	217 (22.1)	11.2	12.6	14.0	70	
		75	203 (20.7)	12.0	13.5	15.0	75	
		80	190 (19.4)	12.8	14.4	16.0	80	
		90	169 (17.2)	14.4	16.2	18.0	90	
		100	152 (15.5)	16.0	18.0	20.0	100	
125	121.6 (12.4)	20.0	22.5	25.0	125			

D	d	L	Spring constant			Catalog No.	Base unit price	
			N/mm (kgf/mm)	Fmm	Load N (kgf)			
Operation count			F=LX16%	F=LX18%	F=LX20%	Type D-L	1~19 pieces	
			1,000,000	500,000	300,000			
27	13.5	20	907 (92.5)	3.2	3.6	Out of range	SWG27-20	
		25	726 (74.0)	4.0	4.5	5.0	25	
		30	605 (61.7)	4.8	5.4	6.0	30	
		35	518 (52.9)	5.6	6.3	7.0	35	
		40	454 (46.3)	6.4	7.2	8.0	40	
		45	403 (41.1)	7.2	8.1	9.0	45	
		50	363 (37.0)	8.0	9.0	10.0	50	
		55	330 (33.6)	8.8	9.9	11.0	55	
		60	302 (30.8)	9.6	10.8	12.0	60	3628
		65	279 (28.5)	10.4	11.7	13.0	65	
		70	259 (26.4)	11.2	12.6	14.0	70	
		75	242 (24.7)	12.0	13.5	15.0	75	
		80	227 (23.1)	12.8	14.4	16.0	80	
		90	202 (20.6)	14.4	16.2	18.0	90	
		100	181 (18.5)	16.0	18.0	20.0	100	
125	145 (14.8)	20.0	22.5	25.0	125			
150	121 (12.3)	24.0	27.0	30.0	150			
30	15	20	1177 (120.0)	3.2	3.6	Out of range	SWG30-20	
		25	941 (96.0)	4.0	4.5	5.0	25	
		30	785 (80.0)	4.8	5.4	6.0	30	
		35	672 (68.6)	5.6	6.3	7.0	35	
		40	588 (60.0)	6.4	7.2	8.0	40	
		45	523 (53.3)	7.2	8.1	9.0	45	
		50	471 (48.0)	8.0	9.0	10.0	50	
		55	428 (43.6)	8.8	9.9	11.0	55	
		60	392 (40.0)	9.6	10.8	12.0	60	
		65	362 (36.9)	10.4	11.7	13.0	65	
		70	336 (34.3)	11.2	12.6	14.0	70	
		75	314 (32.0)	12.0	13.5	15.0	75	
		80	294 (30.0)	12.8	14.4	16.0	80	

COIL SPRINGS

—SWZ—



D	d	L	Spring constant			Catalog No.	Base unit price	
			N/mm (kgf/mm)	Fmm Load N (kgf)	Fmm Load N (kgf)			Fmm Load N (kgf)
Operation count			F=LX10.5%	F=LX12%	F=LX13%	Type D—L	1~19 pieces	
10	5	25	158 (16)	2.6	3.0	3.3	SWZ10—25	
		30	132 (13)	3.2	3.6	3.9	30	
		35	113 (12)	3.7	4.2	4.6	35	
		40	99 (10)	4.2	4.8	5.2	40	
		45	88 (9)	4.7	5.4	5.9	45	
		50	79 (8)	5.3	6.0	6.5	50	
		60	66 (7)	6.3	7.2	7.8	60	
12	6	25	215 (22)	2.6	3.0	3.3	SWZ12—25	
		30	179 (18)	3.2	3.6	3.9	30	
		35	153 (16)	3.7	4.2	4.6	35	
		40	134 (14)	4.2	4.8	5.2	40	
		45	119 (12)	4.7	5.4	5.9	45	
		50	107 (11)	5.3	6.0	6.5	50	
		60	89 (9)	6.3	7.2	7.8	60	
14	7	30	305 (31)	3.2	3.6	3.9	SWZ14—30	
		35	262 (27)	3.7	4.2	4.6	35	
		40	229 (23)	4.2	4.8	5.2	40	
		45	204 (21)	4.7	5.4	5.9	45	
		50	183 (19)	5.3	6.0	6.5	50	
		55	167 (17)	5.8	6.6	7.2	55	
		60	153 (16)	6.3	7.2	7.8	60	
16	8	30	440 (45)	3.2	3.6	3.9	SWZ16—30	
		35	377 (38)	3.7	4.2	4.6	35	
		40	330 (34)	4.2	4.8	5.2	40	
		45	293 (30)	4.7	5.4	5.9	45	
		50	264 (27)	5.3	6.0	6.5	50	
		55	240 (24)	5.8	6.6	7.2	55	
		60	220 (22)	6.3	7.2	7.8	60	
18	9	30	553 (56)	3.2	3.6	3.9	SWZ18—30	
		35	474 (48)	3.7	4.2	4.6	35	
		40	415 (42)	4.2	4.8	5.2	40	
		45	369 (38)	4.7	5.4	5.9	45	
		50	332 (34)	5.3	6.0	6.5	50	
		55	302 (31)	5.8	6.6	7.2	55	
		60	277 (28)	6.3	7.2	7.8	60	
20	10	30	660 (67)	3.2	3.6	3.9	SWZ20—30	
		35	566 (58)	3.7	4.2	4.6	35	
		40	495 (50)	4.2	4.8	5.2	40	
		45	440 (45)	4.7	5.4	5.9	45	
		50	396 (40)	5.3	6.0	6.5	50	
		55	360 (37)	5.8	6.6	7.2	55	
		60	330 (34)	6.3	7.2	7.8	60	
		65	305 (31)	6.8	7.8	8.5	65	
		70	283 (29)	7.4	8.4	9.1	70	
		80	248 (25)	8.4	9.6	10.4	80	
22	11	35	735 (75)	3.7	4.2	4.6	SWZ22—35	
		40	643 (66)	4.2	4.8	5.2	40	
		45	572 (58)	4.7	5.4	5.9	45	
		50	514 (52)	5.3	6.0	6.5	50	
		55	468 (48)	5.8	6.6	7.2	55	
		60	429 (44)	6.3	7.2	7.8	60	
		65	396 (40)	6.8	7.8	8.5	65	
		70	367 (37)	7.4	8.4	9.1	70	
		75	343 (35)	7.9	9.0	9.8	75	
		80	322 (33)	8.4	9.6	10.4	80	

D	d	L	Spring constant			Catalog No.	Base unit price	
			N/mm (kgf/mm)	Fmm Load N (kgf)	Fmm Load N (kgf)			Fmm Load N (kgf)
Operation count			F=LX10.5%	F=LX12%	F=LX13%	Type D—L	1~19 pieces	
25	12.5	40	922 (94)	4.2	4.8	5.2	SWZ25—40	
		45	820 (84)	4.7	5.4	5.9	45	
		50	738 (75)	5.3	6.0	6.5	50	
		55	671 (68)	5.8	6.6	7.2	55	
		60	615 (63)	6.3	7.2	7.8	60	
		65	568 (58)	6.8	7.8	8.5	65	
		70	527 (54)	7.4	8.4	9.1	70	
		75	492 (50)	7.9	9.0	9.8	75	
		80	461 (47)	8.4	9.6	10.4	80	
		90	410 (42)	9.5	10.8	11.7	90	
		100	369 (38)	10.5	12.0	13.0	100	
		125	295 (30)	12.6	14.4	15.6	125	
27	13.5	40	1088 (111)	4.2	4.8	5.2	SWZ27—40	
		45	967 (99)	4.7	5.4	5.9	45	
		50	871 (89)	5.3	6.0	6.5	50	
		55	791 (81)	5.8	6.6	7.2	55	
		60	726 (74)	6.3	7.2	7.8	60	
		65	670 (68)	6.8	7.8	8.5	65	
		70	622 (63)	7.4	8.4	9.1	70	
		75	580 (59)	7.9	9.0	9.8	75	
		80	544 (55)	8.4	9.6	10.4	80	
		90	484 (49)	9.5	10.8	11.7	90	
		100	435 (44)	10.5	12.0	13.0	100	
		125	348 (36)	13.1	15.0	16.3	125	
30	15	35	1422 (145)	3.7	4.2	4.6	SWZ30—35	
		40	1245 (127)	4.2	4.8	5.2	40	
		45	1106 (113)	4.7	5.4	5.9	45	
		50	996 (102)	5.3	6.0	6.5	50	
		55	905 (92)	5.8	6.6	7.2	55	
		60	830 (85)	6.3	7.2	7.8	60	
		65	766 (78)	6.8	7.8	8.5	65	
		70	711 (73)	7.4	8.4	9.1	70	
		75	664 (68)	7.9	9.0	9.8	75	
		80	622 (63)	8.4	9.6	10.4	80	
		90	553 (56)	9.5	10.8	11.7	90	
		100	498 (51)	10.5	12.0	13.0	100	
35	17.5	45	1291 (132)	4.7	5.4	5.9	SWZ35—45	
		50	1162 (118)	5.3	6.0	6.5	50	
		55	1056 (108)	5.8	6.6	7.2	55	
		60	968 (99)	6.3	7.2	7.8	60	
		65	894 (91)	6.8	7.8	8.5	65	
		70	830 (85)	7.4	8.4	9.1	70	
		75	774 (79)	7.9	9.0	9.8	75	
		80	726 (74)	8.4	9.6	10.4	80	
		90	645 (66)	9.5	10.8	11.7	90	
		100	581 (59)	10.5	12.0	13.0	100	
		125	465 (47)	13.1	15.0	16.3	125	
		150	387 (39)	15.8	18.0	19.5	150	

D	d	L	Spring constant			Catalog No.	Base unit price			
			N/mm (kgf/mm)	Fmm Load N (kgf)	Fmm Load N (kgf)			Fmm Load N (kgf)		
Operation count			F=LX10.5%	F=LX12%	F=LX13%	Type D—L	1~19 pieces			
40	20	45	1752 (179)	4.7	5.4	5.9	SWZ40—45			
		50	1577 (161)	5.3	6.0	6.5	50			
		55	1433 (146)	5.8	6.6	7.2	55			
		60	1314 (134)	6.3	7.2	7.8	60			
		65	1213 (124)	6.8	7.8	8.5	65			
		70	1126 (115)	7.4	8.4	9.1	70			
		75	1051 (107)	7.9	9.0	9.8	75			
		80	985 (100)	8.4	9.6	10.4	80			
		90	876 (89)	9.5	10.8	11.7	90			
		100	788 (80)	10.5	12.0	13.0	100			
		125	631 (64)	13.1	15.0	16.3	125			
		150	526 (54)	15.8	18.0	19.5	150			
		175	451 (46)	18.4	21.0	22.8	175			
		50	25	55	2244 (229)	5.8	6.6	7.2	SWZ50—55	
				60	2057 (210)	6.3	7.2	7.8	60	
65	1899 (194)			6.8	7.8	8.5	65			
70	1763 (180)			7.4	8.4	9.1	70			
75	1646 (168)			7.9	9.0	9.8	75			
80	1543 (157)			8.4	9.6	10.4	80			
90	1371 (140)			9.5	10.8	11.7	90			
100	1234 (126)			10.5	12.0	13.0	100			
125	987 (101)			13.1	15.0	16.3	125			
150	823 (84)			15.8	18.0	19.5	150			
175	705 (72)	18.4	21.0	22.8	175					
200	617 (63)	21.0	24.0	26.0	200					

● Load calculation method: Load=Spring constant×Deflection
 (SI units) N=N/mm×Fmm
 kgf=kgf/mm×Fmm
 (kgf=N×0.101972)

- Product guide P.1396
- Load graph P.1432
- Instructions and precautions for the use of coil springs P.1397
- Clearance of D dim. and counterbore hole, and of d dim. and shaft P.1397

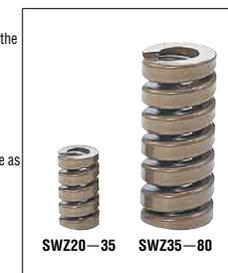
Order **Catalog No.**
SWZ25—80

Days to Ship **Quotation**

Price **Quotation**

Features

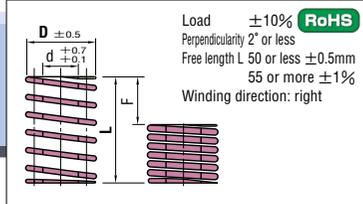
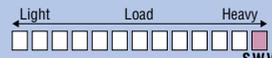
- These springs have approximately 1.6 ~ 2 times the load capacity of SWB (P.1423) for the same size and operation count. The spring constant is 2.5 times of that of SWB. They can be used to make the die more compact and reduce the number of springs.
- The spring inner and outer diameters are the same as SWH, SWB, and other spring lineups, making these products effective when higher load capacities are required.



COIL SPRINGS

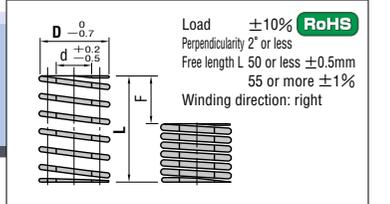
COIL SPRINGS

—SWV—



COIL SPRINGS

—SWX FOR HIGH-SPEED APPLICATIONS—



D	d	L	Spring constant			Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm	Load N (kgf)		
10	5	30	204 {21}	3.2	3.6	3.9	SWV10-30
		35	175 {18}	3.7	4.2	4.6	35
		40	153 {16}	4.2	4.8	5.2	40
		45	136 {14}	4.7	5.4	5.9	45
		50	123 {13}	5.3	6.0	6.5	50
		55	111 {11}	5.8	6.6	7.2	55
12	6	30	306 {31}	3.2	3.6	3.9	SWV12-30
		35	263 {27}	3.7	4.2	4.6	35
		40	230 {23}	4.2	4.8	5.2	40
		45	204 {21}	4.7	5.4	5.9	45
		50	184 {19}	5.3	6.0	6.5	50
		55	167 {17}	5.8	6.6	7.2	55
14	7	30	396 {40}	3.2	3.6	3.9	SWV14-30
		35	340 {35}	3.7	4.2	4.6	35
		40	297 {30}	4.2	4.8	5.2	40
		45	264 {27}	4.7	5.4	5.9	45
		50	238 {24}	5.3	6.0	6.5	50
		55	216 {22}	5.8	6.6	7.2	55
16	8	35	455 {46}	3.7	4.2	4.6	SWV16-35
		40	398 {41}	4.2	4.8	5.2	40
		45	354 {36}	4.7	5.4	5.9	45
		50	319 {33}	5.3	6.0	6.5	50
		55	290 {30}	5.8	6.6	7.2	55
		60	266 {27}	6.3	7.2	7.8	60
18	9	35	560 {57}	3.7	4.2	4.6	SWV18-35
		40	490 {50}	4.2	4.8	5.2	40
		45	436 {44}	4.7	5.4	5.9	45
		50	392 {40}	5.3	6.0	6.5	50
		55	357 {36}	5.8	6.6	7.2	55
		60	327 {33}	6.3	7.2	7.8	60
20	10	40	619 {63}	4.2	4.8	5.2	SWV20-40
		45	550 {56}	4.7	5.4	5.9	45
		50	495 {50}	5.3	6.0	6.5	50
		55	450 {46}	5.8	6.6	7.2	55
		60	413 {42}	6.3	7.2	7.8	60
		65	381 {39}	6.8	7.8	8.5	65
22	11	40	765 {78}	4.2	4.8	5.2	SWV22-40
		45	680 {69}	4.7	5.4	5.9	45
		50	612 {62}	5.3	6.0	6.5	50
		55	556 {57}	5.8	6.6	7.2	55
		60	510 {52}	6.3	7.2	7.8	60
		65	471 {48}	6.8	7.8	8.5	65
25	12.5	50	848 {86}	5.3	6.0	6.5	SWV25-50
		55	771 {79}	5.8	6.6	7.2	55
		60	707 {72}	6.3	7.2	7.8	60
		65	653 {67}	6.8	7.8	8.5	65
		70	606 {62}	7.4	8.4	9.1	70
		75	566 {58}	7.9	9.0	9.8	75

D	d	L	Spring constant			Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm	Load N (kgf)		
27	13.5	55	910 {93}	5.8	6.6	7.2	SWV27-55
		60	834 {85}	6.3	7.2	7.8	60
		65	770 {79}	6.8	7.8	8.5	65
		70	715 {73}	7.4	8.4	9.1	70
		75	667 {68}	7.9	9.0	9.8	75
		80	626 {64}	8.4	9.6	10.4	80
30	15	90	556 {57}	9.5	10.8	11.7	90
		100	501 {51}	10.5	12.0	13.0	100
		125	400 {41}	13.1	15.0	16.3	125
		55	1086 {111}	5.8	6.6	7.2	SWV30-55
		60	996 {102}	6.3	7.2	7.8	60
		65	919 {94}	6.8	7.8	8.5	65
35	17.5	70	853 {87}	7.4	8.4	9.1	70
		75	797 {81}	7.9	9.0	9.8	75
		80	747 {76}	8.4	9.6	10.4	80
		90	664 {68}	9.5	10.8	11.7	90
		100	597 {61}	10.5	12.0	13.0	100
		125	478 {49}	13.1	15.0	16.3	125
40	20	150	398 {41}	15.8	18.0	19.5	150
		55	1267 {129}	5.8	6.6	7.2	SWV35-55
		60	1162 {118}	6.3	7.2	7.8	60
		65	1072 {109}	6.8	7.8	8.5	65
		70	996 {102}	7.4	8.4	9.1	70
		75	929 {95}	7.9	9.0	9.8	75
50	25	80	871 {89}	8.4	9.6	10.4	80
		90	774 {79}	9.5	10.8	11.7	90
		100	697 {71}	10.5	12.0	13.0	100
		125	558 {57}	13.1	15.0	16.3	125
		150	465 {47}	15.8	18.0	19.5	150
		55	1720 {175}	5.8	6.6	7.2	SWV40-55
55	30	60	1577 {161}	6.3	7.2	7.8	60
		65	1456 {148}	6.8	7.8	8.5	65
		70	1352 {138}	7.4	8.4	9.1	70
		75	1261 {129}	7.9	9.0	9.8	75
		80	1183 {121}	8.4	9.6	10.4	80
		90	1051 {107}	9.5	10.8	11.7	90
60	35	100	946 {96}	10.5	12.0	13.0	100
		125	757 {77}	13.1	15.0	16.3	125
		150	631 {64}	15.8	18.0	19.5	150
		175	541 {55}	18.4	21.0	22.8	175
		60	2366 {241}	6.3	7.2	7.8	SWV50-60
		65	2184 {223}	6.8	7.8	8.5	65
70	45	70	2028 {207}	7.4	8.4	9.1	70
		75	1893 {193}	7.9	9.0	9.8	75
		80	1774 {181}	8.4	9.6	10.4	80
		90	1577 {161}	9.5	10.8	11.7	90
		100	1419 {145}	10.5	12.0	13.0	100
		125	1136 {116}	13.1	15.0	16.3	125
80	60	150	946 {97}	15.8	18.0	19.5	150
		175	811 {83}	18.4	21.0	22.8	175
		200	710 {72}	21.0	24.0	26.0	200

● Load calculation method: Load=Spring constant×Deflection
(SI unit) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

Product guide **P.1396**
Load graph **P.1432**
Instructions and precautions for the use of coil springs **P.1397**
Clearance of D dim. and counterbore hole, and of d dim. and shaft **P.1397**

Order **Catalog No.**
SWV25-80

Days to Ship **Quotation**

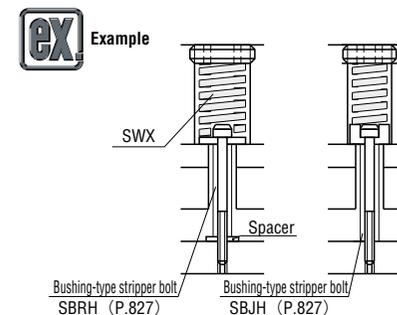
Price **Quotation**

D	d	L	Spring constant		Catalog No.	Base unit price
			N/mm (kgf/mm)	Fmm		
20	9.5	25	510 {52}	2.5	SWX20-25	1~19 pieces
		30	425 {43.3}	3.0	30	
		35	363 {37.1}	3.5	35	
		40	319 {32.5}	4.0	40	
		45	283 {28.9}	4.5	45	
		50	255 {26}	5.0	50	
22	10.5	55	231 {23.6}	5.5	55	
		60	213 {21.7}	6.0	60	
		25	628 {64}	2.5	SWX22-25	1~19 pieces
		30	523 {53.3}	3.0	30	
		35	448 {45.7}	3.5	35	
		40	392 {40}	4.0	40	
25	12	45	349 {35.6}	4.5	45	
		50	314 {32}	5.0	50	
		55	285 {29.1}	5.5	55	
		60	262 {26.7}	6.0	60	
		25	785 {80}	2.5	SWX25-25	1~19 pieces
		30	654 {66.7}	3.0	30	
35	18	35	560 {57.1}	3.5	35	
		40	490 {50}	4.0	40	
		45	435 {44.4}	4.5	45	
		50	392 {40}	5.0	50	
		55	357 {36.4}	5.5	55	
		60	327 {33.3}	6.0	60	
40	20.5	70	280 {28.6}	7.0	70	
		80	245 {25}	8.0	80	
		25	941 {96}	2.5	SWX27-25	1~19 pieces
		30	785 {80}	3.0	30	
		35	673 {68.6}	3.5	35	
		40	588 {60}	4.0	40	
45	25	45	523 {53.3}	4.5	45	
		50	471 {48}	5.0	50	
		55	428 {43.6}	5.5	55	
		60	392 {40}	6.0	60	
		70	336 {34.3}	7.0	70	
		80	294 {30}	8.0	80	

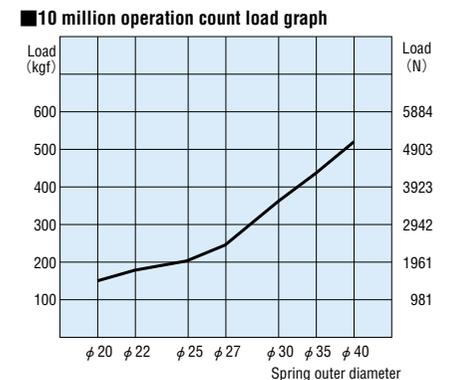
Order **Catalog No.**
SWX20-50

Price **Quotation**

Days to Ship **Quotation**



- Features
- SWX springs were developed for high-speed applications, with the focus on achieving a high operation count (high durability).
 - Because this type is not coated, it can be used in a clean room.

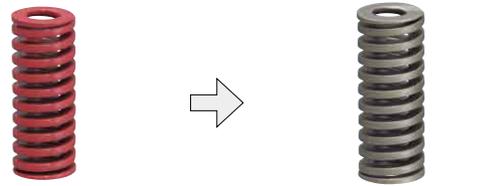


- Features
- These springs have approximately 1.2 times the load capacity of SWZ (P.1427) for the same size and operating count.
 - They can be used to make the die more compact and reduce the number of springs.
 - The spring inner and outer diameters are the same as SWH, SWB, and other spring lineups, making these products easy to use.

ALTERATION FOR COIL SPRING COATING REMOVAL

—GUIDE—

For the purposes of rust proofing and identification, all MISUMI coil springs are coated. However in order to meet the needs of users who are troubled by peeling of the coating during use, we have started offering an alteration for removal of the coil spring coating.



Ordinary coated product

Product with coating removed

Guide to alteration for coating removal

The alteration for removal of the coating involves shot peening the coated coil spring in order to remove the coating. After the coating is removed, oil is applied to prevent corrosion. After the alteration is completed, the identifying coating is removed and the spring metal is exposed.

<Overview of the coating removal process>



Applicable coil springs (Alteration can be applied to the catalog Nos. listed below.)

SWY (P.1407) SWU (P.1408) SWR (P.1409) SWS (P.1411) SWC (P.1413)
SWF (P.1415) SWL (P.1417) SWM (P.1419) SWH (P.1421) SWB (P.1423)

⊗ Cannot be used for coil springs SWG, SWZ, SWV, SWX.

Precautions

- Although oil is applied to the springs after the coating is removed, the oil-tempered wire for springs that is used in coil springs is extremely susceptible to corrosion. Be sure to handle the springs with sufficient care.
- Because corrosion of the springs will cause early breakage, it is recommended that when using a spring with the coating removed, the deflection be set lower than with a coated spring, and that the springs be replaced periodically as needed depending on the operating environment. These springs should be used soon after purchase.
- Be aware that there may be more variation in the load capacity and full length between lots than with ordinary coated products.
- Type identification for coil springs with the coating removed is difficult. Because identification based on wire thickness and the number of coils is difficult, these products must be managed adequately.



Order

When ordering the coating removal alteration, add "NT" prior to the catalog No.

N T - S W U 2 6 - 8 0

Coating removal Ordinary catalog No.



Price

The alteration charge per unit varies depending on the order volume as shown below.

Outer dia. D	1Code		
	1 ~ 10	11 ~ 19	20 or more
6 ~ 8			
10 ~ 35			
37 ~ 70			

Quotation



Days to Ship

Quotation

LOAD-DEFLECTION GRAPHS FOR COIL SPRINGS

High-deflection type



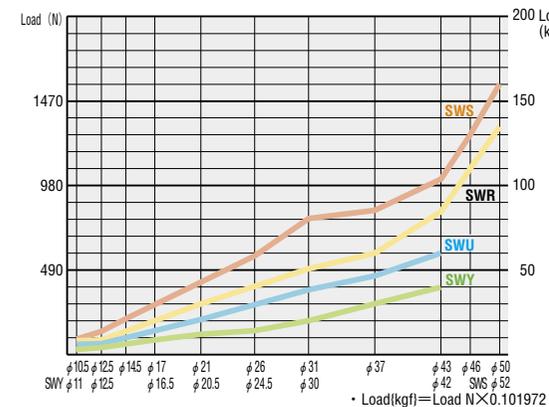
Operation count	1,000,000	300,000
Deflection ratio	65%	70%

Operation count	1,000,000	300,000
Deflection ratio	60%	65%

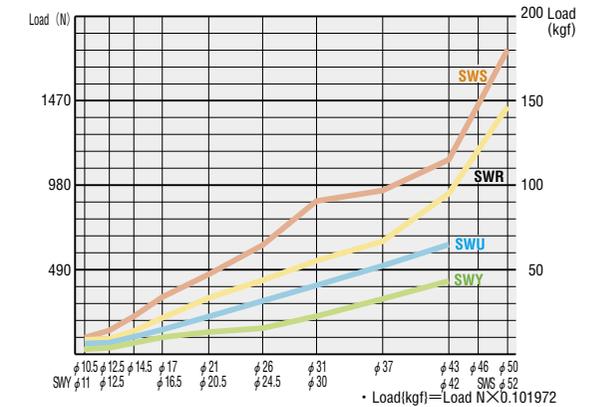
Operation count	1,000,000	300,000
Deflection ratio	50%	55%

Operation count	1,000,000	300,000
Deflection ratio	40%	45%

Operation count: 1 million



Operation count: 300,000



Heavy-load type



Operation count	1,000,000	500,000	300,000
Deflection ratio	50%	55%	60%

Operation count	1,000,000	500,000	300,000
Deflection ratio	40%	45%	50%

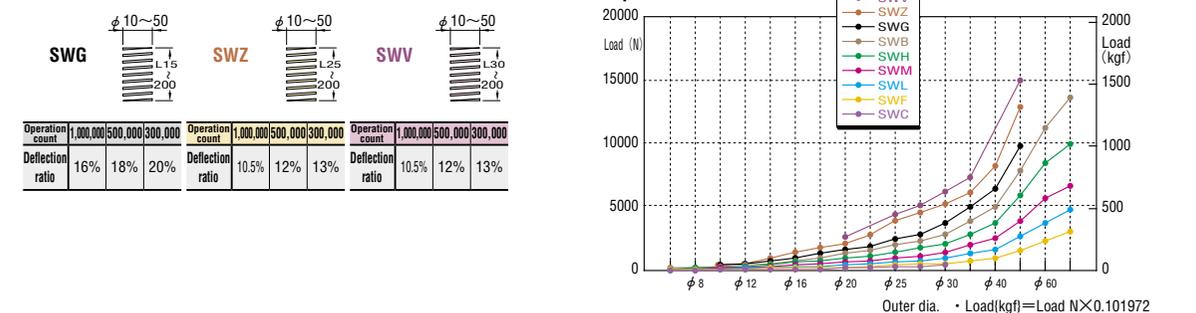
Operation count	1,000,000	500,000	300,000
Deflection ratio	32%	36%	40%

Operation count	1,000,000	500,000	300,000
Deflection ratio	25.6%	28.8%	32%

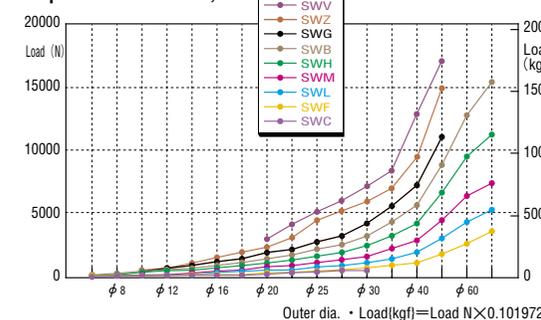
Operation count	1,000,000	500,000	300,000
Deflection ratio	19.2%	21.6%	24%

Operation count	1,000,000	500,000	300,000
Deflection ratio	16%	18%	20%

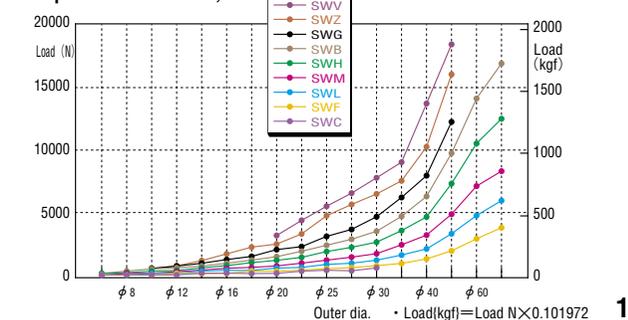
Operation count: 1 million



Operation count: 500,000



Operation count: 300,000



COIL SPRINGS

SPRING GUIDE UNITS

RoHS **CUK**

① Guide pin **M** S45C
 ② Coil spring **H** 50HRC ~ (Surface induction hardening)
 ③ Hexagon socket head cap screw (D40 : M12 D50~60 : M16 D70 : M20)
 ④ Separate disk **M** FC250 Special solid lubricant (embedded)
 ⑤ Pressure disk **M** SS400

When using for the purpose of cam return, also refer to **P.1367**

d	D1	D2	M×P	B	Catalog No.	L: 1mm increments													
						Type	FL	90	100	125	150	175	200	250	300	350	*400	*450	*500
19	50	28	12×1.75	24	CUK	SWF SWL SWM SWH	40	68 ~90	80 ~100	90 ~125	105 ~150	130 ~175	145 ~200	195 ~250	240 ~300	-	-	-	-
24	60	36	16×2.0	28			50	-	-	-	-	-	-	-	-	-	325	375	425
29	70	43	16×2.0	28			60	68 ~90	80 ~100	95 ~125	110 ~150	120 ~175	135 ~200	185 ~250	225 ~300	275 ~350	~400	~450	~500
35	80	48	20×2.5	33			(70)	-	-	-	-	-	-	-	-	-	-	-	-

D=(70) is a specification available for SWF and SWL only. *FL 400 and larger are available for SWF only.

Order Catalog No. **CUK** Spring type **SWM** D **60** FL **250** L **200** Days to Ship **Quotation**

Price **Quotation** Coil spring specifications SWF **P.1415** SWL **P.1417** SWM **P.1419** SWH **P.1421**

Example (When using as a cushion for drawing)

WAVS (WURS) **P.1012**

(When using as a pressure source for pad)

CSR · CSRH **P.1001-1003** PKH **P.982**

① Guide pin

Coil spring outer diameter D	d	b	C	M×P	B	Spring free length (FL)											
						90	100	125	150	175	200	250	300	350	400	450	500
40	19	12	7	12×1.75	24	55	65	75	85	95	110	-	-	-	-	-	-
50	24	17	10	16×2.0	28	60	70	80	90	100	110	110	110	110	110	110	110
60	29	17	10	16×2.0	28	60	70	80	90	100	100	110	110	110	110	110	110
70	35	22	10	20×2.5	33	60	70	80	90	100	100	110	110	110	110	110	110

④ Separate disk **M** FC250 Special solid lubricant (embedded)

⑤ Pressure disk **M** SS400

Components for spring guide units

Coil spring outer diameter D	Catalog No. Type	L: 1mm increments										Base unit price 1~9 pieces															
		No.	90	100	125	150	175	200	250	300	350	400	450	500	90	100	125	150	175	200	250	300	350	400	450	500	
40	① Guide pin CUKGP	40	68 90	80 100	90 125	105 150	130 175	145 200	195 250	240 300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50		50	-	-	-	-	-	-	-	-	325	375	425	-	-	-	-	-	-	-	-	-	-	-	-	-	
60		60	68 90	80 100	95 125	110 150	120 175	135 200	185 250	225 300	275 350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70		70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Quotation

Coil spring outer diameter D	D1	d	Catalog No.		Base unit price 1~9 pieces	Spring outer dia. D	D2	d1	Catalog No.		Base unit price 1~9 pieces
			Type	No.					Type	No.	
40	50	19	④ Separate disk CUKSD	40	Quotation	40	28	13	⑤ Pressure disk CUKPD	40	Quotation
50	60	24		50		50	36	17		50	
60	70	29		60		60	43	17		60	
70	80	35		70		70	48	21		70	

Order Catalog No. **CUKGP 60** Spring FL **250** L **200** Days to Ship **Quotation**

Price **Quotation**

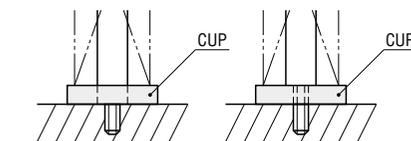
Washers for adjusting the height of spring guide units

D	d	Catalog No.		t	Base unit price 1~9 pieces	D	d	Catalog No.		t	Base unit price 1~9 pieces
		Type	No.					Type	No.		
45	20	CUP	40	1	Quotation	45	12.5	CUR	40	5	Quotation
55	25		50			55	16.5		50		
65	30		60			65	16.5		60		
75	36		70			75	20.5		70		

Order Catalog No. **CUR 40** t **5**

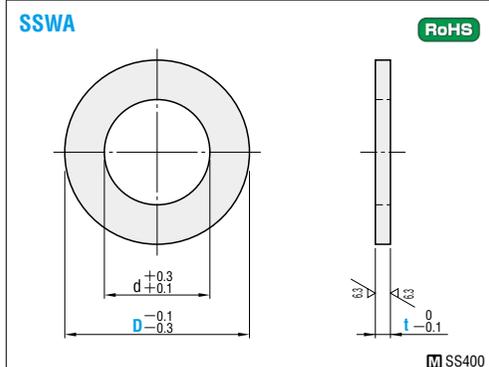
Days to Ship **Quotation**

Price **Quotation**

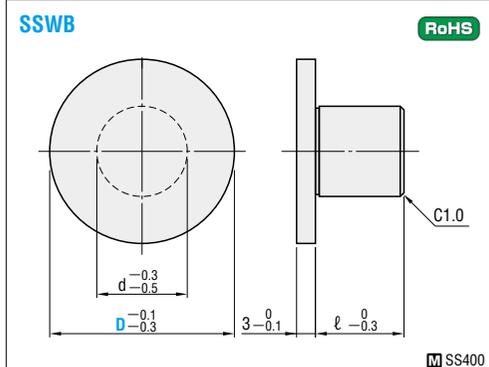


WASHERS FOR COIL SPRINGS

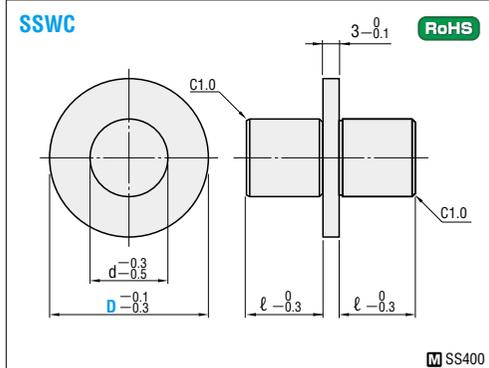
SPRING UNIT FLANGES



d	Spring diameter	Catalog No.		t	Base unit price 1~19 pieces				
		Type	D		t=1.0	t=2.0	t=3.0	t=4.0	t=5.0
3.0	6	SSWA	5	1.0					
5.0	8		7						
6.0	10		9						
7.0	12		11.5						
8.0	14		13						
9.0	16		15						
10.0	18		17						
12.0	20		19						
12.0	22		21						
14.5	25		24						
15.0	27		26						
17.0	30		29						
20.0	35		34						
23.0	40		39						



d	l	Spring diameter	Catalog No.		Base unit price 1~19 pieces
			Type	D	
3.5	4.0	8	SSWB	7	Quotation
4.5	5.0	10		9	
5.5	6.0	12		11	
6.5	7.0	14		13	
7.5	8.0	16		15	
8.5	9.0	18		17	
9.5	10.0	20		19	
10.5	11.0	22		21	
12.0	12.0	25		24	
13.0	13.0	27		26	
14.5	15.0	30		29	
17.0	17.0	35		34	
19.5	20.0	40		39	

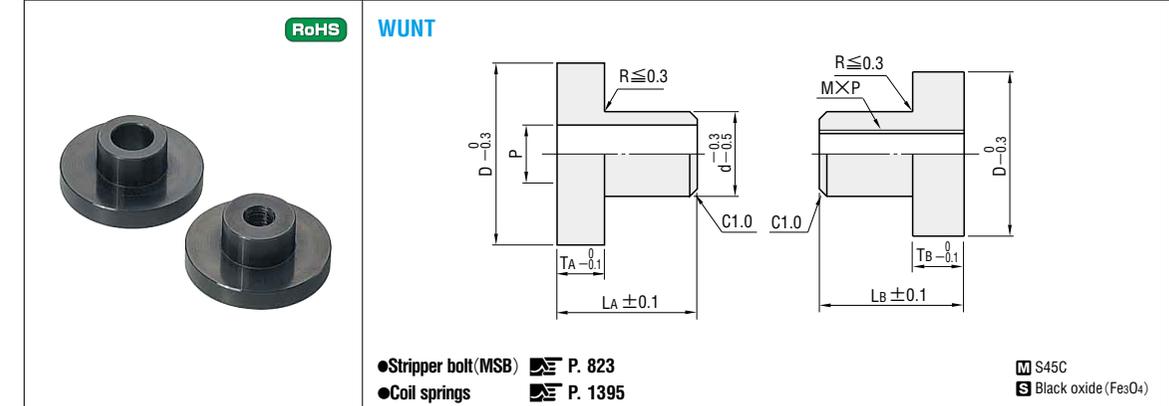
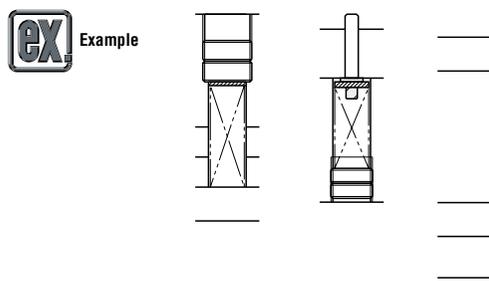


d	l	Spring diameter	Catalog No.		Base unit price 1~19 pieces
			Type	D	
3.5	4.0	8	SSWC	7	Quotation
4.5	5.0	10		9	
5.5	6.0	12		11	
6.5	7.0	14		13	
7.5	8.0	16		15	
8.5	9.0	18		17	
9.5	10.0	20		19	
10.5	11.0	22		21	
12.0	12.0	25		24	
13.0	13.0	27		26	
14.5	15.0	30		29	
17.0	17.0	35		34	
19.5	20.0	40		39	

Order **Catalog No.** — t
SSWA 15 — 2.0
SSWC 9

Days to Ship **Quotation**

Price **Quotation**



Spring dia. D	Bolt	P	M×P	TA·TB	LA	LB	D	d	Catalog No.		Base unit price 1~9 pieces
									Type	No.	
25	MSB8	8	6×1.0	5	10	10	26	11.5	WUNT	25	Quotation
27										27	
30	MSB10	10	8×1.25	5	11	11	31	14		30	
										30-13	
										35	
35	MSB12	12	8×1.25	5	13	13	36	16.5		35	
										40	

The catalog Nos. were changed (for selection of the spring diameter and LB length) due to the addition of WUNT30-13.
Cannot be used for SWC. (Not suitable for the spring inner diameter.)

Order **Catalog No.**
WUNT 25

Days to Ship **Quotation**

Price **Quotation**

- Features**
- An initial load can be applied to the spring.
 - The spring can be deflected beforehand, reducing the trouble involved in die assembly and adjustment.

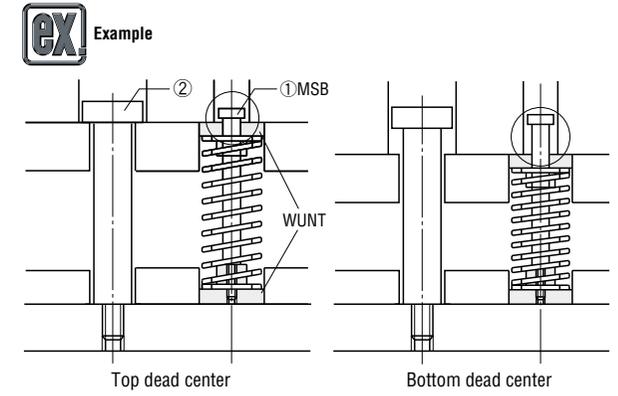
Notes for use

- Unit example

Alterations **Catalog No.** — (LAC·LBC·TAC·TBC)
WUNT 35 — LAC7

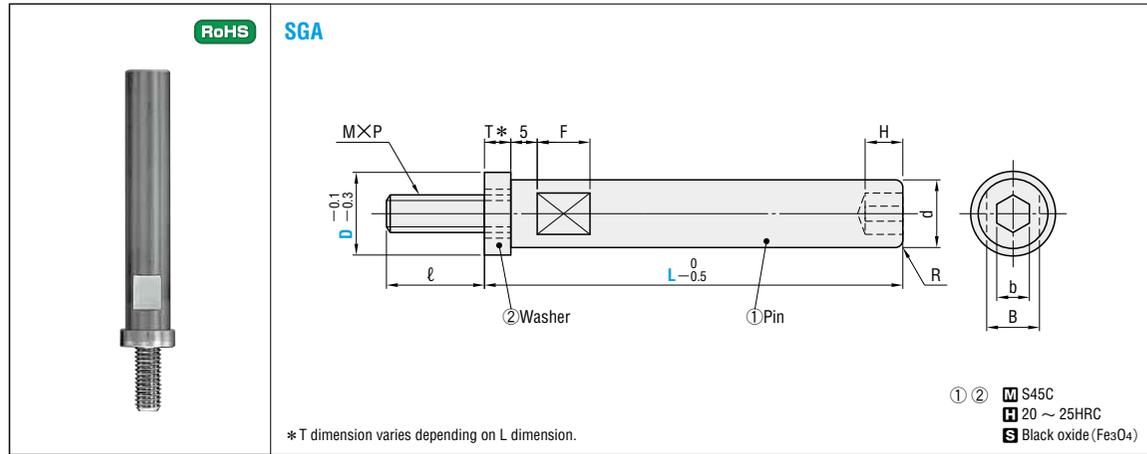
Alteration	Code	Spec.	1Code
LAC	LAC	LA dimension change 0.1mm increments 1.5 + TA ≤ LAC < LA When combined with TAC: 1.5 + TAC ≤ LAC < LA - TAC	Quotation
LBC	LBC	LB dimension change 0.1mm increments 1.5 + TB ≤ LBC < LB When combined with TBC: 1.5 + TBC ≤ LBC < LB - TBC	
TAC	TAC	Head thickness change 0.1mm increments 3 ≤ TAC < TA LA dimension is shortened by (TA - TAC). When combined with LAC, LAC dimension remains as specified.	
TBC	TBC	Head thickness change 0.1mm increments 3 ≤ TBC < TB LB dimension is shortened by (TB - TBC). When combined with LBC, LB dimension remains as specified.	

Some alterations may result in the removal of the surface treatment at the alteration location.



SPRING GUIDE PINS

SPRING GUIDE RETAINERS



MXP	l	b	H	B	F	R	T	d	Coil spring SW				Catalog No.		L 5mm increments
									C	F	L-M-H B-G-Z-V	X	Type	D	
4x0.7	7	3	3	4	8	1	3	6	φ12	φ14	φ14	—	SGA	7	20 ~ 50
									φ14	φ16	φ16	—		8	
5x0.8	8	4	3	6	8	1.5	4	8	—	φ18	φ18	φ20	SGA	9	20 ~ 75
									φ18	—	φ20	φ22		10	
6x1.0	10	5	4	8	8	2	5	10	—	φ20-22	φ22	φ25	SGA	11	20 ~ 85
									φ20	—	φ25	φ27		12.5	
8x1.25	17 (12)	6	4	11	10	2.5	5 (10)	13	φ22	φ25-27	φ27	φ30	SGA	13.5	20 ~ 125
									φ25	φ30	—	—		15	
10x1.5	20 (15)	8	5	14	12	3	5 (10)	16	φ27	—	φ35	φ35	SGA	17.5	30 ~ 185
									—	φ35	—	—		19	
12x1.75	23 (18)	10	6	17	14	3	5 (10)	20	—	φ40	—	—	SGA	22	30 ~ 215
									—	φ50	—	—		25	
16x2.0	27 (22)	14	8	22	16	3	5 (10)	25	—	—	φ60	—	SGA	30	50 ~ 215
									—	φ60	—	—		33	

⚠ No spanner groove is machined when L dimension is 20 for SGA7 ~ 12.5, when L dimension is 20 ~ 25 for SGA13.5 ~ 16, and when L dimension is 30 ~ 35 for SGA17.5 ~ 27.5.
 ⚠ For SGA13.5 ~ 33, when the L dimension is a 5 mm size (L=25, 35, 45...), then the T and l dimensions are those shown in ().
 ⚠ "Coil spring" indicates the outer diameter dimension of the spring.

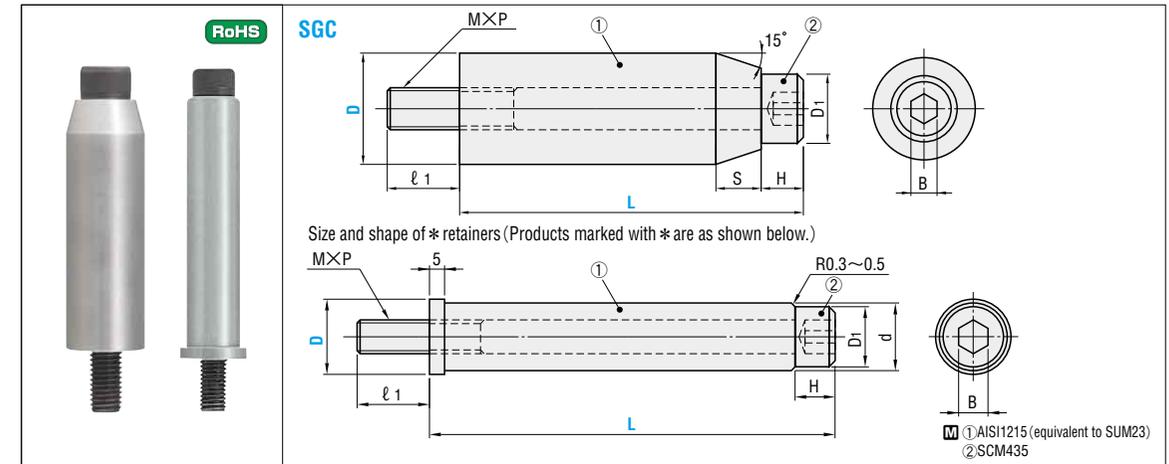
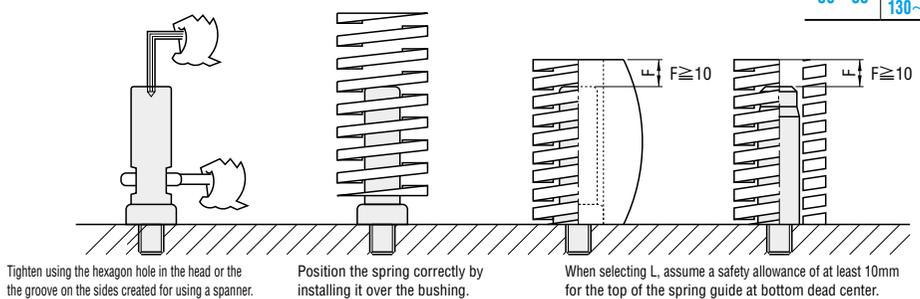
Order **Catalog No.** — **L**
 SGA 20 — 125

Price **Quotation**

Days to Ship **Quotation**

Example

D	L	Base unit price 1~19 pieces	D	L	Base unit price 1~19 pieces
7-8	20~50	Quotation	17.5~20	30~105	Quotation
9-10	20~75	Quotation		110~185	Quotation
11-12.5	20~85	Quotation		130~215	Quotation
13.5~16	20~85	Quotation		130~215	Quotation
	90~125	Quotation	30-33	50~125	Quotation
				130~215	Quotation



D	d	D1	B	M x P	H	S	l1	Coil spring SW				Catalog No.	Base unit price 1~19 pieces
								C	F	L-M-H B-G-Z-V	X		
6	—	4.5	2	M2.5 x P0.45	2.5	2	9.5	φ12	φ14	φ14	—	SGC6-18	23
								φ14	φ16	φ16	—		
8	—	5.5	2.5	M3 x P0.5	3	3	8	φ16	φ18	φ18	φ20	SGC8-20	30
								φ18	φ20	φ20	φ22		
10	—	7	3	M4 x P0.7	4	4	9	φ18	φ20	φ22	φ25	SGC10-20	30
								φ20	φ22	φ25	—		
12	—	8.5	4	M5 x P0.8	5	4	10	φ22	φ25	φ27	φ27	SGC12-20	30
								φ25	φ27	—	—		
14	—	10	5	M6 x P1.0	6	4	11	φ25	φ30	φ30	φ30	SGC14-12	20
								φ30	—	—	—		
16	—	13	6	M8 x P1.25	8	5	13	φ27	φ35	φ35	φ35	SGC16-18	30
								φ35	—	—	—		

Order **Catalog No.**
 SGC 20-23

Days to Ship **Quotation**

Price **Quotation**

D	d	D1	B	M x P	H	S	l1	Coil spring SW				Catalog No.	Base unit price 1~19 pieces
								C	F	L-M-H B-G-Z-V	X		
19	—	—	—	M10 x P1.5	10	5	17	φ30	—	φ40	φ40	SGC19-28	40
								—	—	—	—		
20	—	17	16	M10 x P1.5	10	5	17	—	φ40	—	—	SGC20-23	40
								—	—	—	—		
23	—	—	—	M12 x P1.75	12	8	22	—	—	φ50	—	SGC23-30	40
								—	—	—	—		
26	—	—	—	M12 x P1.75	12	8	22	—	φ50	—	—	SGC26-28	60
								—	—	—	—		
28	—	18	10	M12 x P1.75	12	12	22	—	—	(φ60)	—	SGC28-30	40
								—	—	—	—		
31	—	—	—	M12 x P1.75	12	12	22	—	φ60	—	—	SGC31-28	40
								—	—	—	—		
36	—	—	—	M12 x P1.75	12	15	22	—	φ70 (φ70)	—	—	SGC36-40	60
								—	—	—	—		

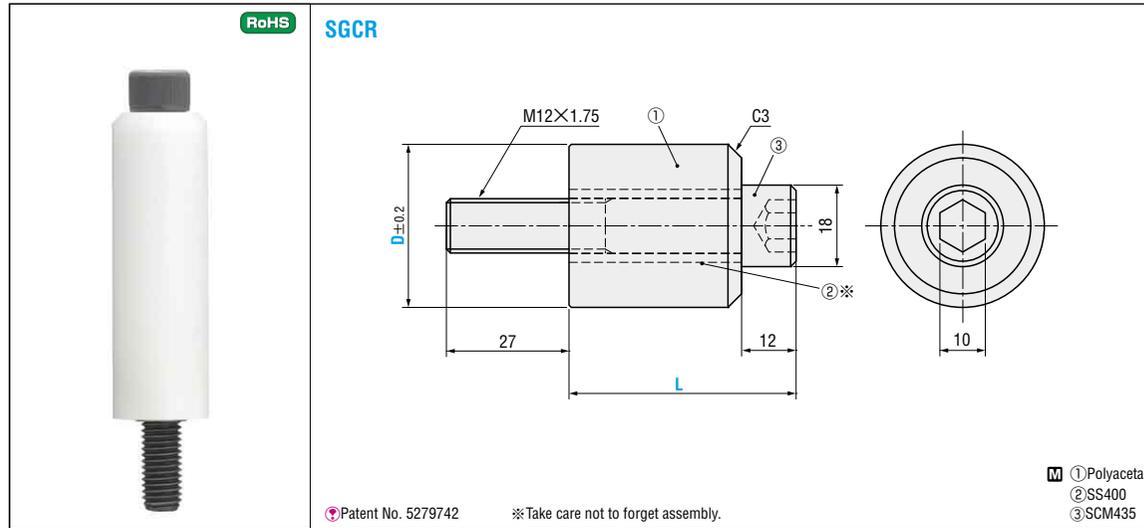
⚠ "Coil spring" indicates the outer diameter dimension of the spring.
 ⚠ (φ) size can be used only with SWL-M-H-B



SPRING GUIDE RETAINERS

— RESIN TYPE —

[PRODUCT DATA] SPRING GUIDE RETAINER



D	Applicable coil spring SW □			Catalog No.
	F	L·M·H·B	G·Z·V	
23	—	φ 50	φ 50	SGCR23— 50
				75
				100
				125
26	φ 50	—	—	SGCR26— 50
				75
				100
				125
28	—	φ 60	—	SGCR28— 50
				75
				100
				125
31	φ 60	—	—	SGCR31— 50
				75
				100
				125
36	φ 70	φ 70	—	SGCR36— 50
				75
				100
				125



Order

Catalog No.

SGCR26—50



Days to Ship

Quotation



Price

Quotation

Precautions on Use

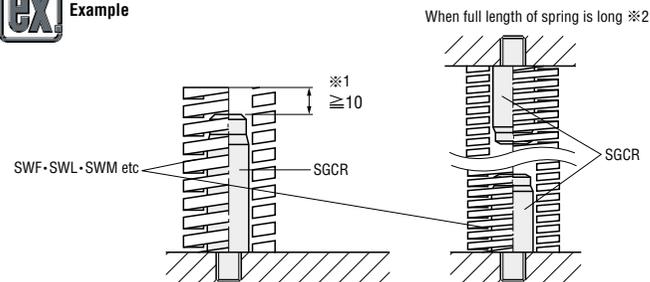
- Ambient operating temperature is up to 110°C. (Ambient operating temperature of coil spring is 80°C)
- White powder may appear on the surface if exposed to ultraviolet ray for a long time, but it is not a problem in use. Avoid storage or use in any place exposed to direct sunlight for a long time.

Outer dimensions are shown for applicable coil springs.

This commodity has been patented by Tokyo Hatsujyo Manufacturing Co., Ltd.



Example



※1 Select L dimension ensuring above 10mm safety allowance on the upper part of spring guide at the bottom dead center.

※2 Criterion for spring is free length/outer diameter=4 or above.

Effects of the Spring guide retainer

If used without a spring guide, problems such as buckling or bending of the spring body may occur, resulting in concentrated high stress on the inside of the bend and then leading to breakage. Be sure to use a spring guide, such as a shaft or outer diameter guide. Especially the longer spring (target is length/outer diameter = 4 or more) tends to occur in buckling or bending, it is recommended to use the spring guide retainer on both ends of the spring.

[Fig.1] Presence or absence, and bending of spring guide retainer

If the guide is inadequate



If it is used appropriately



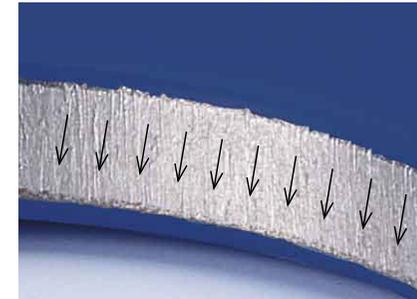
Material of the Spring guide retainer

The coil spring has a characteristic to bend during compression as shown in figure 1 on the left, hence the inner diameter of the spring and the spring guide retainer may contact. If the material of spring guide retainer is metal, the inner diameter surface may wear out due to abrasion. Although the special process to increase the durability is done on the basis material of coil spring, the abrasion may weaken the effect of this special process. If the material of spring guide retainer is resin, the abrasion of the inner diameter surface is limited.

The surface of metal spring guide retainer may get rough due to repeated usage, and it may accelerate the abrasion of the spring inner diameter surface. Check the condition of the timely, and replace if needed.

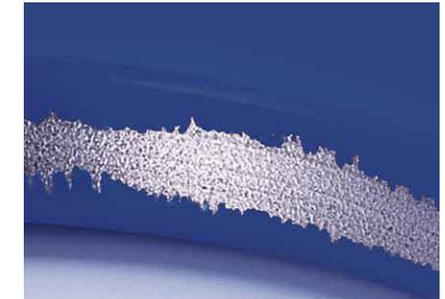
[Fig.2] Abrasion of inner diameter surface of the coil spring

Metal spring guide retainer



(Surface of the coating and base material is worn out)

Resin spring guide retainer



(Only the coating has worn out and not the base material)

- [Test conditions]
- Test product : SWL70-250
 - Test conditions : Eccentricity 2°, Speed 70 SPM
 - Amount of Deflection : 100mm (Conditions 3 hundred thousand times)

COIL SPRINGS