ROUND WIRE COIL SPRINGS
—WR(60% DEFLECTION), WF(45% DEFLECTION)—

MORE ITEMS　SGP Stock　Printed in Red

The quantity discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

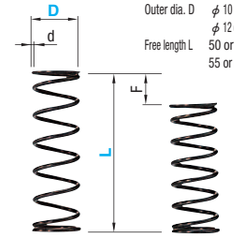
Order　Catalog No. WR 13—60　Delivery　• Printed in Red　SGP Stock　• Printed in Blue　3 Days

For area out of Singapore please refer to P.i.

Quantity discount rate

Quantity	1~9	10~19	20~99	100~500
Rate	—	5%	10%	15%

WR
WF



Spring constant　±10%
Outer dia. D　φ10 or less −0 −0.5mm　φ12 or more −0 −0.8mm
Free length L　50 or less ±1.5mm　55 or more ±2.5mm

RoHS

M SWP—A

Spring constant

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

■WR : Fmax.(Allowable deflection)=L×60%

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty : 1~9
0.23	1.8	3	0.9{0.09}	WR 3— 5	
0.25	2.3	6	1.8{0.18}	10	
0.3	4.8	9	2.6{0.27}	15	
0.3	4.8	12	3.5{0.36}	20	
0.32	6.8	15	4.4{0.45}	25	
0.32	6.8	18	5.3{0.54}	30	
0.35	11.5	21	6.2{0.63}	35	
0.35	11.5	24	7.1{0.72}	40	
0.26	1.6	3	0.9{0.09}	WR 4— 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}	WR 5— 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}	WR 6— 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}	WR 8—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.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty : 1~9
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	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty : 1~9
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	

Quotation

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

No grinding on both ends of all WR type series.
The solid height values are reference only. There may be some variations depending on lots.
Operation frequency : 1 million times.
Product Outline
Directions and precautions for coil springs

Stocks Availability Subjected to Prior Sales.

■WF : Fmax. (Allowable deflection)=L×45%

The quantity discount rate is also applicable to alteration cost.
All price & lead time are to be quoted.

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty : 1~9
0.26	2	2.25	1.1{0.11}	WF 3— 5*	
0.32	5	4.5	2.2{0.22}	10*	
0.32	5	6.7	3.2{0.33}	15*	
0.35	7	9	4.4{0.45}	20*	
0.35	7	11.2	5.5{0.56}	25*	
0.4	13.2	13.5	6.6{0.67}	30	
0.4	13.2	15.7	7.6{0.78}	35	
0.4	13.2	18	8.8{0.9 }	40	
0.32	2.3	2.25	1.1{0.11}	WF 4— 5*	
0.35	3.1	4.5	2.2{0.22}	10*	
0.4	5.6	6.7	3.2{0.33}	15*	
0.4	5.6	9	4.4{0.45}	20*	
0.45	9.9	11.2	5.5{0.56}	25*	
0.45	9.9	13.5	6.6{0.67}	30*	
0.5	16.5	15.7	7.6{0.78}	35	
0.5	16.5	18	8.8{0.9 }	40	
0.5	16.5	20	9.8{1.0 }	45	
0.5	16.5	22.5	10.8{1.1 }	50	
0.5	16.5	24.7	12.1{1.23}	55	
0.5	16.5	27	12.7{1.3 }	60	
0.55	26.4	29.2	14.3{1.46}	65*	
0.55	26.4	31.5	15.4{1.58}	70*	
0.35	2	2.25	1.1{0.11}	WF 5— 5*	
0.38	2.8	4.5	2.2{0.22}	10*	
0.4	3.4	6.7	3.2{0.33}	15*	
0.45	5.4	9	4.4{0.45}	20*	
0.5	8.5	11.2	5.5{0.56}	25*	
0.55	13.2	13.5	6.6{0.67}	30	
0.55	13.2	15.7	7.6{0.78}	35	
0.55	20.4	18	8.8{0.9 }	40	
0.6	20.4	20	9.8{1.0 }	45	
0.6	20.4	22.5	10.8{1.1 }	50	
0.6	20.4	24.7	12.1{1.23}	55	
0.6	20.4	27	12.7{1.3 }	60	
0.6	20.4	29.2	14.3{1.5 }	65	
0.6	20.4	31.5	15.4{1.6 }	70	
0.4	2.3	2.25	1.1{0.11}	WF 6— 5*	
0.5	5	4.5	2.2{0.22}	10	
0.55	8	6.7	3.2{0.33}	15	
0.55	8	9	4.4{0.45}	20	
0.6	12	11.2	5.5{0.56}	25	
0.65	16	13.5	6.6{0.67}	30	
0.65	17	15.7	7.6{0.78}	35	
0.65	17	18	8.8{0.9 }	40	
0.65	17	20	9.8{1.0 }	45	
0.7	25.2	22.5	10.8{1.1 }	50	
0.7	25.2	24.7	12.1{1.23}	55	
0.7	25.2	27	12.7{1.3 }	60	
0.7	25.2	29.2	14.3{1.46}	65	
0.7	25.2	31.5	14.7{1.5 }	70	
0.7	25.2	36	17.7{1.8 }	80	
0.6	5	4.5	2.2{0.22}	WF 8—10	
0.65	7.5	6.7	3.2{0.33}	15	
0.7	10.8	9	4.4{0.45}	20	
0.7	10.8	11.2	5.5{0.56}	25	
0.75	14.5	13.5	6.6{0.67}	30	
0.75	14.5	15.7	7.6{0.78}	35	
0.8	20	18	8.8{0.9 }	40	
0.8	20	20	9.8{1.0 }	45	
0.8	20	22.5	10.8{1.1 }	50	
0.8	20	24.7	12.1{1.23}	55	
0.85	27.6	27	12.7{1.3 }	60	
0.85	27.6	29.2	14.3{1.46}	65	
0.85	27.6	31.5	14.7{1.5 }	70	
0.85	28.1	36	17.7{1.8 }	80	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty : 1~9
0.65	5	4.5	2.2{0.22}	WF10—10	
0.65	5	6.7	3.2{0.33}	15	
0.8	10.4	9	4.4{0.45}	20	
0.8	10.4	11.2	5.5{0.56}	25	
0.85	14	13.5	6.6{0.67}	30	
0.85	14	15.7	7.6{0.78}	35	
0.9	17.5	18	8.8{0.9 }	40	
0.9	17.5	20	9.8{1.0 }	45	
0.9	17.5	22.5	10.8{1.1 }	50	
0.9	17.5	24.7	12.1{1.23}	55	
1.0	31	27	12.7{1.3 }	60	
1.0	31	29.2	14.3{1.46}	65	
1.0	31	31.5	14.7{1.5 }	70	
1.0	31	36	17.7{1.8 }	80	
0.7	4.6	4.5	2.3{0.23}	WF12—10	
0.7	4.6	6.7	3.2{0.33}	15	
0.8	7.2	9	4.4{0.45}	20	
0.8	7.2	11.2	5.5{0.56}	25	
0.9	11.3	13.5	6.6{0.67}	30	
0.9	11.3	15.7	7.6{0.78}	35	
0.9	11.3	18	8.8{0.9 }	40	
0.9	11.3	20	9.8{1.0 }	45	
1.0	18	22.5	10.8{1.1 }	50	
1.0	18	24.7	12.1{1.23}	55	
1.0	18	27	12.7{1.3 }	60	
1.0	18	29.2	14.3{1.46}	65	
1.1	28.1	31.5	14.7{1.5 }	70	
1.1	27.5	36	17.7{1.8 }	80	
0.75	4.9	4.5	2.3{0.23}	WF13—10	
0.8	6	6.7	3.2{0.33}	15	
0.8	6	9	4.4{0.45}	20	
0.85	7.2	11.2	5.5{0.56}	25	
1.0	15	13.5	6.6{0.67}	30	
1.0	15	15.7	7.6{0.78}	35	
1.0	15	18	8.8{0.9 }	40	
1.0	15	20	9.8{1.0 }	45	
1.0	15	22.5	10.8{1.1 }	50	
1.1	22	24.7	12.1{1.23}	55	
1.1	22	27	12.7{1.3 }	60	
1.1	22	29.2	14.3{1.46}	65	
1.1	22	31.5	14.7{1.5 }	70	
1.1	22	36	17.7{1.8 }	80	
1.2	33.6	40.5	19.9{2.0 }	90	
0.8	5.2	6.7	3.2{0.33}	WF14—15	
0.9	7.9	9	4.4{0.45}	20	
0.9	7.9	11.2	5.5{0.56}	25	
1.0	12	13.5	6.6{0.67}	30	
1.0	12	15.7	7.6{0.78}	35	
1.0	12	18	8.8{0.9 }	40	
1.0	12	20	9.8{1.0 }	45	
1.1	18.2	22.5	10.8{1.1 }	50	
1.1	18.2	24.7	12.1{1.23}	55	
1.1	18.2	27	12.7{1.3 }	60	
1.2	27.6	29.2	14.3{1.46}	65	
1.2	27.6	31.5	14.7{1.5 }	70	
1.2	27.6	36	17.7{1.8 }	80	
1.3	39.7	40.5	19.9{2.0 }	90	

d	Solid height	F max.	N{kgf} max.	Catalog No. Type D—L	U/Price Q'ty : 1~9
0.9	6.3	6.7	3.2{0.33}	WF16—15	
1.0	8.7	9	4.4{0.45}	20	
1.0	8.7	11.2	5.5{0.56}	25	
1.1	12.8	13.5	6.6{0.67}	30	
1.1	12.8	15.7	7.6{0.78}	35	
1.2	18.6	18	8.8{0.9 }	40	
1.2	18.6	20	9.8{1.0 }	45	
1.2	18.6	22.5	10.8{1.1 }	50	
1.2	18.6	24.7	12.1{1.23}	55	
1.3	26.8	27	12.7{1.3 }	60	
1.3	26.8	29.2	14.3{1.46}	65	
1.3	26.8	31.5	14.7{1.5 }	70	
1.4	36	36	17.7{1.8 }	80	
1.4	36.4	40.5	19.9{2.0 }	90	
1.2	9	9	8.8{0.9 }	WF18—20	
1.3	12.4	11.2	10.8{1.1 }	25	
1.3	12.4	13.5	12.7{1.3 }	30	
1.4	16.1	15.7	14.7{1.5 }	35	
1.5	21	18	17.7{1.8 }	40	
1.5	21	20	19.9{2.03}	45	
1.5	21	22.5	22.1{2.25}	50	
1.6	28.8	24.7	24.3{2.48}	55	
1.6	28.8	27	26.5{2.7 }	60	
1.6	28.8	29.2	28.7{2.93}	65	
1.7	37.4	31.5	30.9{3.15}	70	
1.7	37.4	36	35.3{3.6 }	80	
1.2	7.2	9	8.8{0.9 }	WF20—20	
1.3	9.8	11.2	10.8{1.1 }	25	
1.4	12.6	13.5	12.7{1.3 }	30	
1.4	12.6	15.7	14.7{1.5 }	35	
1.5	16.5	18	17.7{1.8 }	40	
1.5	16.5	20	19.9{2.03}	45	
1.6	21.6	22.5	22.1{2.25}	50	
1.6	21.6	24.7	24.3{2.48}	55	
1.6	21.6	27	26.5{2.7 }	60	
1.7	28.1	29.2	28.7{2.93}	65	
1.7	28.1	31.5	30.9{3.15}	70	
1.7	28.1	36	35.3{3.6 }	80	
1.3	7.8	9	8.8{0.9 }	WF22—20	
1.4	10.5	11.2	11.0{1.12}	25	
1.4	10.5	13.5	13.2{1.35}	30	
1.5	13.5	15.7	15.4{1.57}	35	
1.5	13.5	18	17.7{1.8 }	40	
1.7	22.1	20.2	19.8{2.02}	45	
1.7	22.1	22.5	22.1{2.25}	50	
1.7	22.1	24.7	24.2{2.47}	55	
1.8	28.8	27	26.5{2.7 }	60	
1.8	28.8	29.2	28.6{2.92}	65	
1.8	28.8	31.5	30.9{3.15}	70	
1.8	28.8	36	35.3{3.6 }	80	
1.7	14.1	13.5	13.2{1.35}	WF27—30	
1.7	14.1	15.7	15.4{1.57}	35	
1.7	14.1	18	17.7{1.8 }	40	
1.9	21.4	20.2	19.8{2.02}	45	
1.9	21.4	22.5	22.1{2.25}	50	
2.0	26	24.7	24.2{2.47}	55	
2.0	26	27	26.5{2.7 }	60	
2.0	26	29.2	28.6{2.92}	65	
2.0	26	31.5	30.9{3.15}	70	
2.0	26	36	35.3{3.6 }	80	

Quotation

●Load calculation method : N(load)=N/mm(spring constant)×F(deflection)
(International units) N=N/mm×Fmm
kgf=kgf/mm×Fmm
(kgf=N×0.101972)

No grinding on both ends of * marked WF type springs.
The solid height values are reference only.
There may be some variations depending on lots.
Operation frequency : 1 million times.
Product Outline
Directions and precautions for coil springs

Stocks Availability Subjected to Prior Sales.