

Springs
Overview

*The heat resistance temperatures shown in the tables are for the spring wire material. The data are obtained in room temperature. Allowable load and durability may decrease depending on the various conditions under higher temperature.

* The load range shown is for material JIS-SWP-A.
* Values for the Tension Springs Configurable Type are for coil length =50.

Table with 7 columns: Type, Features, Type, Part Number, Material, Load*, N{kgf}. Rows include Tension Springs with various load types (Extra Light, Light, Medium, Medium Heavy, Heavy, Configurable) and materials (AWA, AUA, AWY, BUY, AWU, BWU, AUU, BUU, AWS, BWS, AUS, BUSS, AWF, AWT, BWT, AUT, BUT, WFSP, BWFSF, UFSP, BUFSP, LWS, LUS).

Table with 7 columns: Type, Features, Type, Part Number, Material, Max. Allowable Deflection %, Load*, N{kgf}. Rows include Round Coil Springs with O.D. Referenced and I.D. Referenced types, and various materials (WY, WR, WF, WL, WT, WM, WH, WB, VUR, VUF, VUL, VUM, FWR, FWF, FWT, UV, UY, UR, UL, UTT, UM, UH, UBB, FUR, FUF, FUT).

Table with 7 columns: Type, Features, Type, Part Number, Material, Load*, N{kgf}. Rows include Flat Springs, Torsion Springs, and Constant Force Springs with various materials (IBN, IBNS, IBNW, UA90, UA135, UA180, CFS, CFSB) and part numbers (P339, P340, P341).

Table with 7 columns: Type, Features, Type, Part Number, Material, Color, Max. Allowable Deflection %, Load N{kgf}. Rows include Irregular Shaped Coil Springs with various materials (SWY, SWU, SWR, SWS, SWF, SWL, SWM, SWH, SWB) and part numbers (P361, P362, P363, P364, P365, P367, P368, P369, P370).

1N=0.101972kgf 1deg=1°(Angle)

Tension Springs

Load P[N] = Initial Tension Pi[N] + (Spring Constant k[N/mm] x Deflection F[mm])

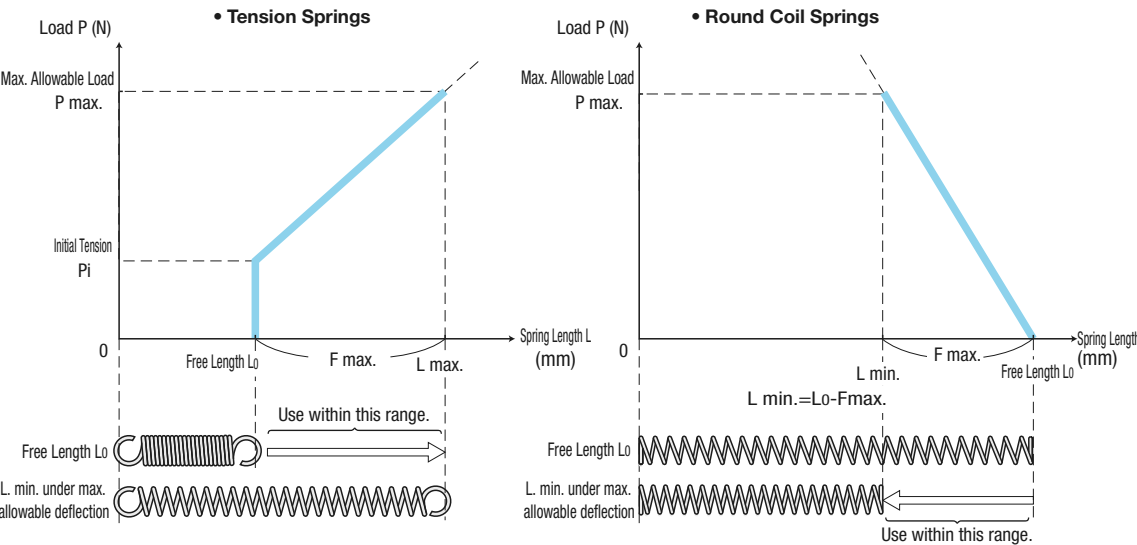
- MISUMI Tension Springs (except for Specified Types) are standardized to maintain the maximum load constantly to the same diameter.
- Use the springs within the range of the allowable deflection F max.(mm). Using at higher than the allowable deflection values may cause deformation or failure after a few uses.
- For Tension Springs durability can not be shown because stress concentration may occur depending on the hook installation. It is recommended to use the springs within 70 % of allowable deflection F max.(mm).
- It is recommended to use the tension springs (AW□, BW□, AWFM, WFSP, LWS, LWSH) under ambient temperature (at 40°C or less). Load value attenuates when tension springs are used in temperature higher than 40°C, although it depends on other conditions.

Round Coil Springs / Irregular Shaped Coil Springs

Load P[N] = (Spring Constant k[N/mm] x Deflection F[mm])

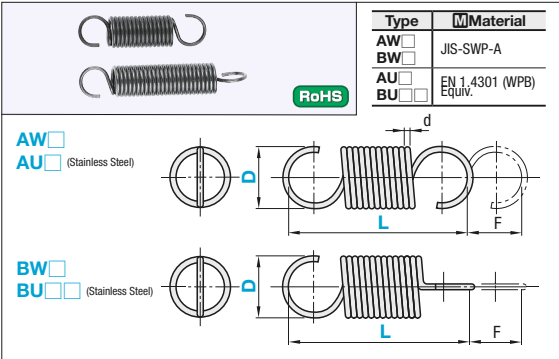
- MISUMI Round Coil Springs are standardized to maintain the spring constant constantly to the same diameter. The tolerance of spring constant is ±10%.
- Irregular shaped coil springs are standardized to maintain the maximum load constantly to the same diameter. The load tolerances vary depending on the spring type, please refer to the respective page.
- Use the springs within the range of the allowable deflection F max.(mm). Using at higher than the allowable deflection values may cause deformation or failure.
- The values of solid length are for reference only. Using it compressed to the solid length may cause deformation or break after a few uses.
- Round Coil Springs are manufactured based on the following diametric tolerance priorities given. I.D. Selectable Type: Inner diameter tolerance prioritized / O.D. Selectable Type: Outer diameter tolerance prioritized.
- For inner/outer diameter tolerances of irregular shaped coil springs, refer to the respective pages.
- It is recommended to use the round coil springs and irregular shaped coil springs under ambient temperature (40°C or less). Load value attenuates when tension springs are used in temperature higher than 40°C, although it depends on other conditions. (Heat resistant springs are listed on "Standard Components for Plastic Mold".)
- Irregular Shaped Coil Springs are listed on "Standard Components for Press Dies" and "Standard Components for Plastic Mold". (Large Dia. Sizes are also available.)

Relationship between Spring Length L and Load P



Tension Springs

Extra Light Load / Light Load / Light Medium Load / Medium Load



Extra Light Load

Part Number		Wire Dia. dmm	Dynamic Load		(Initial Tension) N	(Spring Constant) N/mm	Unit Price	
Type	D-L		Max. Deflection Fmax. mm	Max. Load N			AWA	AUA
AWA AUA	2-10	0.2	6.7	0.69	0.13	0.083		
	15		11.8			0.047		
	20		17.2			0.032		
	25		22.8			0.025		
	30		28.5			0.020		
AWA AUA	3-10	0.25	10.4	1.27	0.15	0.11		
	15		23.0			0.049		
	20		35.9			0.031		
	25		47.9			0.024		
	30		57.5			0.020		
AWA AUA	4-15	0.35	14.6	2.26	0.25	0.14		
	20		24.1			0.083		
	25		32.5			0.062		
	30		42.7			0.047		
	35		51.2			0.039		
AWA AUA	5-15	0.45	8.2	3.24	0.49	0.033		
	20		15.5			0.18		
	25		21.5			0.13		
	30		29.4			0.093		
	35		35.0			0.078		
AWA AUA	6-20	0.55	16.2	6.08	0.64	0.084		
	25		25.2			0.064		
	30		34.7			0.054		
	35		42.7			0.049		
	40		50.4			0.041		
AWA AUA	8-25	0.7	18.1	8.53	1.08	0.088		
	30		27.1			0.079		
	35		36.2			0.069		
	40		44.7			0.064		
	45		54.2			0.054		
AWA AUA	10-30	0.9	13.4	10.8	2.06	0.11		
	35		18.5			0.088		
	40		24.0			0.078		
	45		29.6			0.068		
	50		35.6			0.058		
AWA AUA	12-35	1.1	17.8	19.6	2.94	0.083		
	40		25.0			0.078		
	45		31.0			0.068		
	50		37.7			0.058		
	55		44.7			0.048		

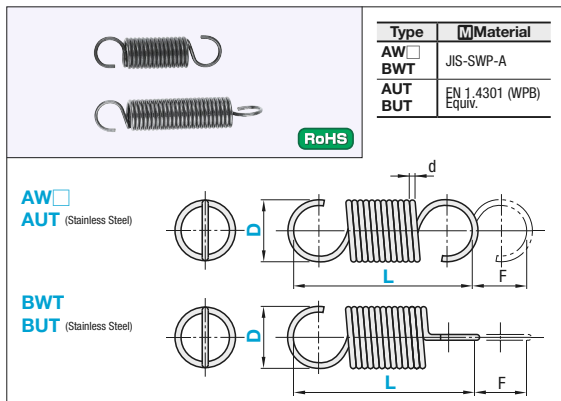
Part Number
AWY*10-50

Light Load Type

Part Number		Wire Dia. dmm	Dynamic Load		(Initial Tension) N	(Spring Constant) N/mm	Unit Price	
Type	D-L		Max. Deflection Fmax. mm	Max. Load N			AWY BWY	AUY BUY
AWY AUY	2-10	0.25	5.7	1.86	0.34	0.27		
	15		10.3			0.15		
	20		14.0			0.11		
	25		18.2			0.08		
	30		22.1			0.07		
AWY BWY AUY BUY	3-10	0.3	8.7	2.25	0.29	0.23		
	15		16.6			0.12		
	20		25.0			0.08		
	25		33.3			0.06		
	30		40.0			0.05		
AWY BWY AUY BUY	4-15	0.4	10.0	3.24	0.59	0.26		
	20		16.8			0.16		
	25		22.5			0.12		
	30		28.4			0.09		
	35		33.7			0.08		
AWY BWY AUY BUY	5-15	0.5	6.8	4.22	0.88	0.49		
	20		11.7			0.28		
	25		17.0			0.20		
	30		21.2			0.16		
	35		26.1			0.13		
AWY BWY AUY BUY	6-20	0.6	14.0	8.14	1.27	0.32		
	25		21.2			0.25		
	30		28.0			0.20		
	35		35.0			0.17		
	40		41.1			0.14		
AWY BWY AUY BUY	8-25	0.8	15.1	12.75	2.35	0.69		
	30		21.2			0.49		
	35		26.5			0.39		
	40		33.1			0.31		
	45		39.2			0.26		
AWY BWY AUY BUY	10-30	1.0	11.5	15.00	3.73	0.98		
	35		15.3			0.74		
	40		19.8			0.57		
	45		23.9			0.47		
	50		28.7			0.39		
AWY BWY AUY BUY	12-35	1.2	12.0	31.37	5.39	1.18		
	40		16.6			0.98		
	45		22.0			0.83		
	50		27.8			0.62		
	55		33.3			0.52		
AWY AUY	14-40	1.5	15.4	38.24	8.43	1.94		
	45		21.0			1.42		
	50		25.4			1.17		
	55		30.8			0.97		
	60		37.0			0.8		
AWY AUY	16-45	1.6	15.8	43.15	9.12	2.16		
	50		21.0			1.62		
	55		25.7			1.32		
	60		31.5			1.08		
	65		35.8			0.95		
AWY AUY	18-50	1.7	15.8	48.00	9.60	2.16		
	55		21.0			1.62		
	60		25.7			1.32		
	65		31.5			1.08		
	70		37.0			0.95		
AWY AUY	20-60	1.8	15.8	52.96	9.81	2.16		
	65		21.0			1.62		
	70		25.7			1.32		
	75		31.5			1.08		
	80		37.0			0.95		
AWY AUY	22-65	2.0	15.8	58.00	10.40	2.16		
	70		21.0			1.62		
	75		25.7			1.32		
	80		31.5			1.08		
	85		37.0			0.95		
AWY AUY	24-70	2.2	15.8	63.00	11.00	2.16		
	75		21.0			1.62		
	80		25.7			1.32		
	85		31.5			1.08		
	90		37.0			0.95		
AWY AUY	26-75	2.4	15.8	68.00	11.67	2.16		
	80		21.0			1.62		
	85		25.7			1.32		
	90		31.5			1.08		
	95		37.0			0.95		
AWY AUY	28-80	2.6	15.8	73.00	12.33	2.16		
	85		21.0			1.62		
	90		25.7			1.32		
	95		31.5			1.08		
	100		37.0			0.95		
AWY AUY	30-90	2.8	15.8	78.45	12.75	2.16		
	95		21.0			1.62		
	100		25.7			1.32		
	105		31.5			1.08		
	110		37.0			0.95		
AWY AUY	32-100	3.0	15.8	83.33	13.33	2.16		
	105		21.0			1.62		
	110		25.7			1.32		
	115		31.5			1.08		
	120		37.0			0.95		
AWY AUY	34-110	3.2	15.8	88.00	14.00	2.16		
	115		21.0			1.62		
	120		25.7			1.32		
	125		31.5			1.08		
	130		37.0			0.95		
AWY AUY	36-120	3.4	15.8	93.00	14.67	2.16		
	125		21.0			1.62		
	130		25.7			1.32		
	135		31.5			1.08		
	140		37.0			0.95		
AWY AUY	38-130	3.6	15.8	98.00	15.33	2.16		
	135		21.0			1.62		
	140		25.7			1.32		
	145		31.5			1.08		
	150		37.0			0.95		
AWY AUY	40-140	4.0	15.8	103.00	16.00	2.16		
	145		21.0			1.62		
	150		25.7			1.32		
	155		31.5			1.08		
	160		37.0			0.95		
AWY AUY	42-150	4.2	15.8	108.00	16.67	2.16		
	155		21.0			1.62		
	160		25.7			1.32		
	165		31.5			1.08		
	170		37.0			0.95		
AWY AUY	44-160	4.4	15.8	113.00	17.33	2.16		
	165		21.0			1.62		
	170		25.7			1.32		
	175		31.5			1.08		
	180		37.0			0.95		
AWY AUY	46-170	4.6	15.8	118.00	18.00	2.16		
	175		21.0			1.62		
	180		25.7			1.32		
	185		31.5			1.08		
	190		37.0			0.95		
AWY AUY	48-180	4.8	15.8	123.00	18.67	2.16		
	185		21.0			1.62		
	190		25.7			1.32		
	195		31.5			1.08		
	200		37.0			0.95		
AWY AUY	50-190	5.0	15.8	128.00	19.33	2.16		
	195		21.0			1.62		
	200		25.7			1.32		
	205		31.5			1.08		
	210		37.0			0.95		
AWY AUY	52-200	5.2	15.8	133.00	20.00	2.16		
	205		21.0			1.62		
	210		25.7			1.32		
	215		31.5			1.08		
	220		37.0			0.95		
AWY AUY	54-210	5.4	15.8	138.00	20.67	2.16		
	215		21.0			1.62		
	220		25.7			1.32		
	225		31.5			1.08		
	230		37.0			0.95		
AWY AUY	56-220	5.6	15.8	143.00	21.33	2.16		
	225		21.0			1.62		
	230		25.7			1.32		
	235		31.5			1.08		
	240		37.0			0.95		
AWY AUY	58-230	5.8	15.8	148.00	22.00	2.16		
	235		21.0			1.62		
	240		25.7			1.32		
	245		31.5			1.08		
	250		37.0			0.95		
AWY AUY	60-240	6.0	15.8	153.00	22.67	2.16		
	245		21.0			1.62		
	250		25.7			1.32		
	255		31.5			1.08		
	260		37.0			0.95		
AWY AUY	62-250	6.2	15.8	158.00	23.33	2.16		
	255		21.0			1.62		
	260		25.7			1.32		
	265		31.5			1.08		
	270		37.0			0.95		
AWY AUY	64-260	6.4	15.8	163.00	24.00	2.16		
	265		21.0			1.62		
	270		25.7			1.32		
	275		31.5			1.08		
	280		37.0			0.95		
AWY AUY	66-270	6.6	15.8	168.00	24.67	2.16		
	275		21.0			1.62		
	280		25.7			1.32		
	285		31.5			1.08		
	290		37.0			0.95		
AWY AUY	68-280	6.8	15.8	173.00	25.33	2.16		
	285		21.0			1.62		
	290		25.7			1.32		
	295		31.5			1.08		
	300		37.0			0.95		
AWY AUY	70-290	7.0	15.8	178.00	26.00	2.16		
	295		21.0			1.62		
	300		25.7			1.32		
	305		31.5			1.08		
	310		37.0			0.95		
AWY AUY	72-300	7.2	15.8	183.00	26.67	2.16		
	305		21.0			1.62		
	310		25.7			1.32		
	315		31.5			1.08		
	320		37.0			0.95		
AWY AUY	74-310	7.4	15.8	188.00	27.33	2.16		
	315		21.0			1.62		
	320		25.7			1.32		
	325		31.5			1.08		
	330		37.0			0.95		
AWY AUY	76-320	7.6	15.8	193.00	28.00	2.16		
	325		21.0			1.62		
	330		25.7			1.32		
	335		31.5			1.08		
	340		37.0			0.95		
AWY AUY	78-330	7.8	15.8	198.00	28.67	2.16		
	335		21.0			1.62		
	340		25.7			1.32		
	345		31.5			1.08		
	350		37.0			0.95		
AWY AUY	80-340	8.0	15.8	203.00	29.33	2.16		
	345		21.0			1.62		
	350		25.7			1.32		
	355		31.5			1.08		
	360		37.0			0.95		
AWY AUY	82-350	8.2	15.8	208.00	30.00	2.16		
	355		21.0			1.62		
	360		25.7			1.32		
	365		31.5			1.08		
	370		37.0			0.95		
AWY AUY	84-360	8.4	15.8	213.00	30.67	2.16		
	365		21.0			1.62		
	370		25.7			1.32		
	375		31.5			1.08		
	380		37.0			0.95		
AWY AUY	86-370	8.6	15.8	218.00	31.33	2.16		
	375		21.0			1.62		
	380		25.7			1.32		
	385		31.5			1.08		
	390		37.0			0.95		
AWY AUY	88-380	8.8	15.8	223.00	32.00	2.16		
	385		21.0			1.62		
	390		25.7			1.32		
	395		31.5			1.08		
	400		37.0			0.95		
AWY AUY	90-390	9.0	15.8	228.00	32.67	2.16		
	395		21.0			1.62		
	400		25.7			1.32		
	405		31.5			1.08		
	410		37.0			0.95		
AWY AUY	92-400	9.2	15.8	233.00	33.33	2.16		
	405		21.0			1.62		
	410		25.7			1.32		
	415		31.5			1.08		
	420		37.0			0.95		
AWY AUY	94-410	9.4	15.8	238.00	34.00	2.16		
	415		21.0			1.62		
	420		25.7			1.32		
	425		31.5			1.08		
	430		37.0			0.95		
AWY AUY	96-420	9.6	15.8	243.00	34.67	2.16		
	425		21.0			1.62		
	430		25.7			1.32		
	435		31.5			1.08		
	440		37.0			0.95		
AWY AUY	98-430	9.8	15.8	248.00	35.33	2.16		
	435		21.0			1.62		
	440		25.7			1.32		
	445		31.5			1.08		
	450		37.0			0.95		
AWY AUY	100-450	10.0	15.8	253.00	36.00	2.16		
	455		21.0			1.62		
	460		25.7			1.32		
	465		31.5			1.08		
	470		37.0			0.95		
AWY AUY	102-460	10.2	15.8	258.00	36.67	2.16		
	465		21.0			1.62		
	470		25.7			1.32		
	475		31.5			1.08		
	480		37.0			0.95		
AWY AUY	104-470	10.4	15.8	263.00	37.33	2.16		
	475		21.0			1.62		
	480		25.7			1.32		
	485		31.5			1.08		
	490		37.0			0.95		
AWY AUY	106-480	10.6	15.8	268.00	38.00	2.16		
	485		21.0			1.62		
	490		25.7			1.32		
	495		31.5			1.08		
	500		37.0			0.95		
AWY AUY	108-490	10.8	15.8	273.00	38.67	2.16		
	495		21.0			1.62		
	500		25.7			1.32		
	505		31.5			1.08		
	510		37.0			0.95		
AWY AUY	110-500	11.0	15.					

Tension Springs

Medium Heavy Load / Heavy Load Type



Medium Heavy Load Type

Part Number		Wire Dia. dmm	Dynamic Load		Initial Tension N	(Spring Constant) N/mm	Unit Price
Type	D-L		Max. Deflection Fmax. mm	Max. Load N			
AWF	3-10	0.45	2.2	6.47	1.57	2.26	
	15		4.5			1.08	
	20		6.7			0.74	
	25		9.1			0.54	
	30		11.4			0.43	
AWF	4-15	0.55	4.5	8.43	1.86	1.47	
	20		7.1			0.93	
	25		10.0			0.66	
	30		12.6			0.52	
	35		15.2			0.43	
AWF	5-15	0.7	3.9	14.71	2.45	3.14	
	20		6.9			1.77	
	25		9.6			1.28	
	30		12.5			0.98	
	35		15.6			0.78	
AWF	6-20	0.9	3.9	23.54	5.88	4.51	
	25		6.0			2.94	
	30		7.8			2.26	
	35		10.0			1.77	
	40		12.0			1.47	
AWF	8-25	1.1	5.8	31.38	6.86	4.23	
	30		8.3			2.94	
	35		10.9			2.26	
	40		13.2			1.86	
	45		15.6			1.57	
AWF	10-30	1.4	6.5	49.03	12.75	5.58	
	35		8.7			4.17	
	40		10.7			3.39	
	45		12.9			2.81	
	50		15.2			2.39	
AWF	12-35	1.8	5.0	83.36	23.54	7.0	
	40		7.0			8.55	
	45		9.0			6.65	
	50		11.0			5.44	
	55		13.0			4.60	

Part Number
AWT10-50

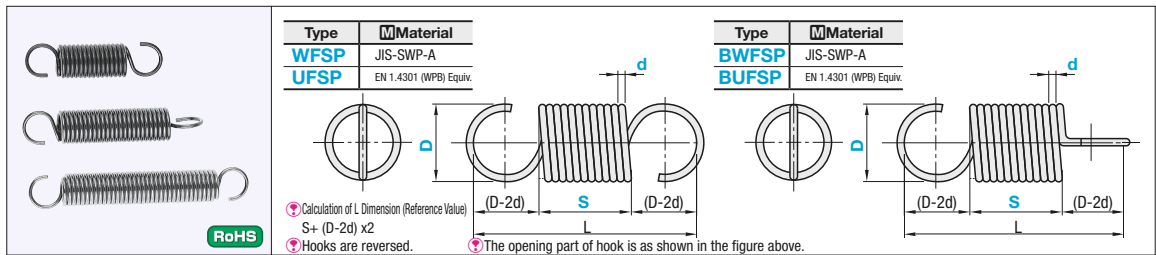
Heavy Load Type * marked dimensions are for AWT and AUT only.

Part Number		Wire Dia. dmm	Dynamic Load		Initial Tension N	(Spring Constant) N/mm	Unit Price	
Type	D-L		Max. Deflection Fmax. mm	Max. Load N			AWT BWT	AUT BUT
AWT AUT BWT BUT	3-10	0.5	2.0	8.8	2.16	3.24		
	15		3.7			1.77		
	20		5.2			1.27		
	25		6.8			0.98		
	*30		8.5			0.78		
AWT AUT BWT BUT	4-15	0.6	4.0	11.1	2.55	2.16		
	20		6.4			1.37		
	25		8.4			0.98		
	30		10.9			0.78		
	*35		12.4			0.69		
AWT AUT BWT BUT	5-15	0.8	2.9	20.79	5.1	5.39		
	20		4.6			3.43		
	25		6.4			2.45		
	30		8.4			1.86		
	*35		10.0			1.57		
AWT AUT BWT BUT	6-20	1.0	3.7	33.15	8.6	6.57		
	25		5.3			4.61		
	30		6.9			3.53		
	35		8.3			2.94		
	*40		10.0			2.45		
AWT BWT AUT BUT	8-25	1.2	5.3	41.19	9.81	5.88		
	30		7.3			4.31		
	35		9.1			3.43		
	40		11.9			2.65		
	45		13.6			2.35		
AWT BWT AUT BUT	10-30	1.6	5.2	77.47	20.59	10.89		
	35		6.8			8.34		
	40		8.4			6.77		
	45		10.0			5.69		
	50		11.6			4.9		
AWT BWT AUT BUT	12-40	2.0	6.6	120.62	34.3	13.04		
	45		7.7			11.18		
	50		9.4			9.22		
	55		10.5			8.24		
	60		12.1			7.16		
AWT	14-40	2.3	5.8	154.95	45.11	19.02		
	45		7.0			15.59		
	50		8.4			13.14		
	55		9.6			11.47		
	60		10.9			10.1		
AWT	16-50	2.6	7.5	195.15	55.9	18.63		
	55		9.0			15.49		
	60		10.4			13.34		
	65		11.9			11.67		
	70		13.4			10.4		
AWT	18-55	2.9	8.3	236.34	68.65	20.1		
	60		10.0			16.67		
	65		11.6			14.71		
	70		12.5			13.44		
	75		14.1			11.77		
AWT	20-60	3.2	9.2	281.45	82.38	21.57		
	65		11.9			16.67		
	70		14.7			13.53		
	75		17.5			11.38		
	80		20.1			9.9		
AWT	24-80	4.0	11.7	430.51	123.6	26.48		
	90		13.7			22.46		
	100		16.6			18.63		
	125		22.5			13.63		
	150		28.5			10.79		

* Initial tension and spring constant are for reference only. Load (kgf) = Load N x 0.101972

Tension Springs

Configurable



Part Number		Wire Dia. dmm	S 1mm Increment	Reference Max. Deflection mm		Standard Spring Constant N/mm		Initial Tension N	
Type	D			WFSP	UFSP	WFSP	UFSP	WFSP	UFSP
WFSP UFSP BWFS BUFS	3	0.3	10~300	88	87	0.025	0.021	0.18	0.21
				41	42	0.12	0.10	0.53	0.64
				86	87	0.04	0.04	0.31	0.38
				48	46	0.15	0.13	0.77	0.92
	4	0.4	10~500	84	82	0.07	0.06	0.49	0.59
				50	51	0.18	0.16	1.01	1.21
				79	82	0.10	0.09	0.71	0.85
				36	36	0.47	0.41	2.13	2.55
	6	0.6	10~550	74	76	0.18	0.16	1.26	1.51
				41	42	0.58	0.51	3.04	4.26
				56	57	0.39	0.34	2.45	3.43
				33	33	1.05	0.93	4.41	6.17
WFSP UFSP BWFS BUFS	8	0.8	10~550	74	70	0.27	0.24	1.96	2.74
				44	43	0.73	0.65	4.31	6.03
				29	28	1.70	1.50	7.64	10.70
				116	113	0.15	0.13	1.18	1.65
	10	1.0	10~550	71	70	0.39	0.35	2.84	3.98
				46	46	0.91	0.80	5.39	7.55
				31	30	1.88	1.66	8.72	12.21
				74	70	0.27	0.24	1.96	2.74
	12	1.2	10~550	44	43	0.73	0.65	4.31	6.03
				29	28	1.70	1.50	7.64	10.70
				116	113	0.15	0.13	1.18	1.65
				46	46	0.91	0.80	5.39	7.55



Ordering Example

Part Number - d - S
WFSP3 - 0.3 - 10
UFSP20 - 2.6 - 498

* Reference Max. Deflection and standard spring constant are the values when S Dimension is 50. For other dimensions, use the formula below for calculation.

* Max. Deflection

Max. Deflection (mm) = $\frac{\text{Configurable S Dimension}}{50 (\text{Reference S Dimension})} \times \text{Reference Max. Deflection}$

* Spring Constant

Spring Constant (N/mm) = $\frac{50 (\text{Reference S Dimension})}{\text{Configurable S Dimension}} \times \text{Standard Spring Constant}$

Accuracy Standards

D Dimension Tolerance

D/d ¹	Tolerance
8 or Less	±1.5% of D dimension (Min. ±0.2mm)
8~20	±2% of D dimension (Min. ±0.3mm)

*1 D/d = Spring Index

S Dimension Tolerance

When d≤0.5, ±2x Wire Dia.

(Ex: When d=0.3, ±0.6)

When d>

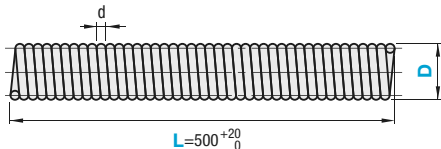
Tension Springs / Hooks

Long, Medium Load

Tension Springs Long, Medium Load



Type	Material
LWS	JIS-SWP-A
LUS	EN 1.4301 (WPB) Equiv.



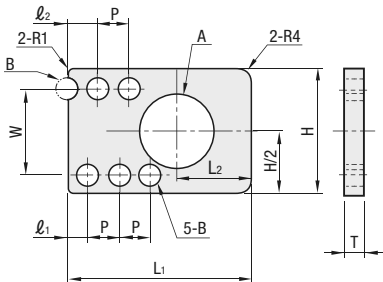
Part Number		Spring Constant N/mm	Wire Dia. dmm	Initial Tension N	Max. Deflection %	Applicable Hook	Unit Price	
Type	D-L						LWS	LUS
LWS LUS	5-500	0.020	0.6	1.57	50	HBFK□5		
	6-500	0.050	0.8	3.53		HBFK□6		
	8-500	0.060	1.0	4.9		HBFK□8		
	10-500	0.075	1.2	5.49		HBFK□10		
	12-500	0.190	1.6	14.71		HBFK□12		
LWS	14-500	0.210	1.8	16.67		HBFK□14		-
	16-500	0.230	2.0	19.61		HBFK□16		
	18-500	0.340	2.3	27.46		HBFK□18		

Load {kgf} = Load N x0.101972

Hooks



Type	Material	Surface Treatment
HBFKN	EN 1.0330 Equiv.	Black Oxide
HBFKS	EN 1.4301 Equiv.	-



Part Number		W	A	B	P	L1	L2	H	T	ℓ1	ℓ2	Unit Price	
Type	No.											HBFKN	HBFKS
HBFKN HBFKS	5	4.1	5	1.0	2.0	24	6	10	1.0	1.0	2.0		
	6	4.9											
	8	6.6	6	1.5	2.6	26	7	15		1.5	2.8		
	10	8.4											
	12	9.9	7	2.2	3.2	30	7.5	18	2.0	2.0	3.6		
	14	12.2											
	16	14.0	9	2.5	4.0	34	8.5	22		2.5	4.5		
	18	15.7											

Please choose the same number as D Dimension of LWS or LUS.

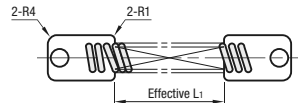


Ordering Example

Part Number

LWS10-500
HBFKN10

How to Use



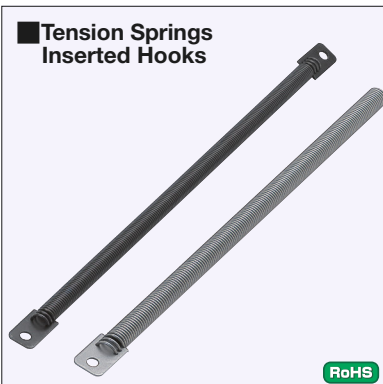
Springs can be cut to desired lengths.
Use the hook HBFKN by inserting the springs in its five holes.
Do not exceed 50% of the max. deflection for full length L1 when cutting.

Spring Constant should be $\frac{L}{L_1}$ times.

Tension Springs

Inserted Hooks

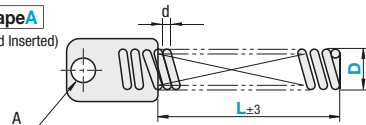
Tension Springs Inserted Hooks



Type	Material		Surface Treatment
	Springs	Hooks	Hooks
LWSH	JIS-SWP-A	EN 1.0330 Equiv.	Black Oxide
LUSH	EN 1.4301 (WPB) Equiv.	EN 1.4301 Equiv.	-

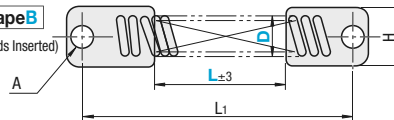
ShapeA

(One End Inserted)



ShapeB

(Both Ends Inserted)



- JIS-SWP-A comes with EN 1.0330 Equiv. hook, and EN 1.4301 (WPB) Equiv. comes with the EN 1.4301 Equiv. hook.
- Load Formula
Load = Spring Constant x Deflection mm + Initial Tension
- The springs for LWSH and LUSH are different from that for LWS and LUS.

Part Number		D	L 10mm Increment	Wire Dia. dmm	A	H	Max. Deflection %	L1	Initial Tension (N)		Standard Spring Constant (N/mm)		
Type	Shape								LWSH	LUSH	LWSH	LUSH	
LWSH LUSH	A B	5	200 500	0.6	5	10	70	L+36	1.01	1.32	0.045	0.040	
		6		0.8					2.28	2.96	0.114	0.101	
		8		1.0					3.04	4.26	0.145	0.128	
		10		1.2	6	15		60	L+38	4.31	6.03	0.183	0.163
		12		1.6						8.72	12.21	0.470	0.415
		14		1.8	7	20			L+45	10.6	14.84	0.525	0.465
		16		2.0			12.6			17.64	0.593	0.525	
		18		2.3	9	25	L+51			18.7	26.18	0.850	0.753

Shape A

D	Unit Price									
	L200~250		L260~300		L310~350		L360~400		L410~450	
	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH
5										
6										
8										
10										
12										
14										
16										
18										

Shape B

D	Unit Price									
	L200~250		L260~300		L310~350		L360~400		L410~450	
	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH
5										
6										
8										
10										
12										
14										
16										
18										



Ordering Example

Part Number

LWSHA - 5 - 500

- Standard Spring Constant
Standard spring constant is the value when the L Dimension is 200 on shape B.
For other dimensions, use the formula below for calculation.

Spring Constant (N/mm) = $\frac{200 \text{ (Reference L Dimension)}}{\text{Configurable L Dimension}} \times \text{Standard Spring Constant}$

Ex.) LWSHB-8-400
 $0.0725 \text{ (N/mm)} = \frac{200}{400} \times 0.145$
kgf=Nx0.101972