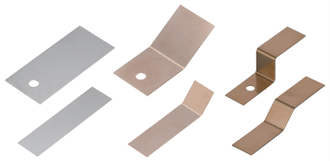
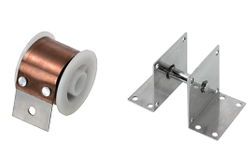
Springs
Overview

***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 SWP-A.
* Values for the Tension Springs Configurable Type are for coil length =50.

Type	Features	Type	Part Number (Material: SWP-A)		Part Number (Material: SUS304-WPB)		Load* N{kgf} min.	Load* N{kgf} max.
Tension Springs	 *Heat Resistant Temperature: SWP-A 0~120°C, SUS304-WPB 0~180°C	Extra Light Load	P.329	AWA	P.329	AUA	0.69{0.07}	19.6{2.0}
		Light Load	P.329	AWY BWY	P.329	AUY BUY	1.86{0.19}	78.45{8.0}
		Light Medium Load	P.330	AWU BWU	P.330	AUU BUU	2.45{0.25}	98.07{10.0}
		Medium Load	P.330	AWS BWS	P.330	AUS BUSS	3.53{0.36}	225.55{23.01}
		Medium Heavy Load	P.331	AWF	-	-	6.47{0.66}	83.36{8.5}
		Heavy Load	P.331	AWT BWT	P.331	AUT BUT	8.8{0.9}	430.51{43.91}
		Configurable	P.332	WFSP BWFSP	P.332	UFSP BUFSP	2.37{0.2}	156{15.9}
		Long, No Hook	P.333	LWS	P.333	LUS	-	-

Type	Features	Type	Part Number (Material: SWP-A)		Part Number (Material: SUS304-WPB)		Max. Allowable Deflection % (Standard Usage Count)	Load* N{kgf} min.	Load* N{kgf} max.
Round Coil Springs	 (Stainless Steel)  *Heat Resistant Temperature: SWP-A 120°C, SUS304-WPB 180°C	O.D. Referenced	P.343	WY	P.353	UV, UY	75 (1 Million Times)	0.18{0.018}	1.75{0.179}
			P.344	WR	P.353	UR	60 (1 Million Times)	0.9{0.09}	23.5{2.4}
			P.345	WF	P.354	UF	45 (1 Million Times)	1.1{0.11}	35.3{3.6}
			P.346	WL	P.355	UL	40 (1 Million Times)	0.98{0.1}	117.7{12}
			P.347	WT	P.356	UTT	40 (1 Million Times)	2.9{0.3}	125.5{12.8}
			P.348	WM	P.357	UM	28 ~ 35 (1 Million Times)	3.4{0.35}	171.6{17.5}
			P.349	WH	P.358	UH	20 ~ 30 (1 Million Times)	4.4{0.45}	441.3{45}
			P.350	WB	P.359	UBB	25 (1 Million Times)	5.9{0.6}	735.5{75}
		I.D. Referenced	-	-	P.351	VUR	60 (1 Million Times)	2.65{0.27}	17.64{1.8}
			-	-	P.351	VUF	45 (1 Million Times)	3.33{0.34}	22.05{2.25}
			-	-	P.352	VUL	40 (1 Million Times)	5.88{0.60}	39.20{4.00}
			-	-	P.352	VUM	35 (1 Million Times)	15.39{1.57}	102.90{10.50}
		O.D. Referenced L Dimension Configurable	P.360	FWR	P.360	FUR	60 (1 Million Times)	2.5{0.25}	55.2{5.63}
			P.360	FWF	P.360	FUF	50 (1 Million Times)	4.5{0.46}	100.0{10.2}
			P.360	FWT	P.360	FUT	40 (1 Million Times)	7.1{0.73}	128.0{13.1}

Type	Flat Springs			Torsion Springs			Constant Force Springs	
Features								
Type	Straight	One-Point-Bend	Two-Point-Bend	Arm Angle 90°	Arm Angle 135°	Arm Angle 180°	Main Body	Bracket
Material	SUS304-CSP			SUS304-WPB			SUS301EH	SUS430
Part Number	IBN	IBNS	IBNW	UA90□	UA135□	UA180□	CFS	CFSB
Page	P.339			P.340			P.341	

Type	Features	Part Number (Material: Oil tempered wires for springs)		Color	Max. Allowable Deflection % (Standard Usage Count)	Load N{kgf} min.	Load N{kgf} max.
Irregular Shaped Coil Springs	 * Heat Resistant Temperature: Oil tempered wires for springs 200°C  * Heat Resistant Temperature: Oil tempered wires for springs 200°C	P.361	SWY	Pastel green	65 (1 Million Times)	29.4{3}	392.3{40}
					70 (300,000 Times)	31.7{3.2}	425.6{43}
		P.362	SWU	Light Blue	60 (1 Million Times)	68.6{7}	588.4{60}
					65 (300,000 Times)	73.9{7.5}	637.4{65}
		P.363	SWR	Ivory	50 (1 Million Times)	78.5{8}	1323.9{135}
					55 (300,000 Times)	87.2{8.8}	1456.3{148}
		P.364	SWS	Orange	40 (1 Million Times)	87.2{8.8}	1569.1{160}
					45 (300,000 Times)	97.1{10}	1765.2{180}
		P.365	SWF	Yellow	40 (1 Million Times)	47.1{4.8}	3138.1{320}
					50 (300,000 Times)	58.8{6}	3922.6{400}
		P.367	SWL	Blue	32 (1 Million Times)	62.8{6.4}	657.0{67}
					40 (300,000 Times)	78.5{8}	823.8{84}
		P.368	SWM	Red	25.6 (1 Million Times)	78.5{8}	980.7{100}
					32 (300,000 Times)	98.1{10}	1225.8{125}
		P.369	SWH	Green	19.2 (1 Million Times)	109.8{11.2}	1471.0{150}
					24 (300,000 Times)	137.4{14}	1833.8{187}
		P.370	SWB	Brown	16 (1 Million Times)	141.2{14.4}	1922.1{196}
					20 (300,000 Times)	176.5{18}	2402.6{245}

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. Produced based on the maximum load value, the initial tension and spring constant are reference values.
- 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. Also, do not extend tension springs more than its allowable deflection during the installation.
- 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