

Flat Springs

Straight / 1 Point Bend Type / 2 Point Bend Type

Straight



1 Point Bend Type



2 Point Bend Type



IBN (Stainless Steel)



IBNS (Stainless Steel)



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

IBNW



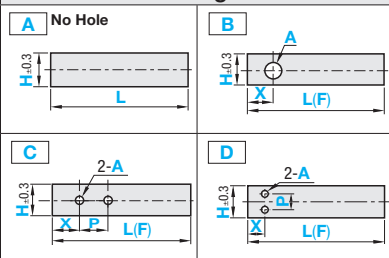
Due to low temperature annealing, surface color is golden brown.

(Side View of Development)

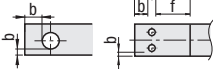
T	Tolerance
0.2	±0.02
0.3	±0.025
0.4	±0.025
0.5	±0.035
0.6	±0.035
0.7	±0.040
0.8	±0.040

Material EN 1.4301 (CSP) Equiv.

Hole Machining Selection



Machining Limits



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

IBN Straight

Part Number	Type	Shape	T Selection	H	L 1mm Increment	A Selection	0.5mm Increment	Unit Price
							X	P
IBN	A	0.2	0.3	0.4	0.5	6	2.0	A+1.5≤P
IBN	B	0.2	0.3	0.4	0.5	8	2.5	
IBN	C	0.3	0.4	0.5	0.6	10	3.0	
IBN	D	0.3	0.4	0.5	0.6	12	3.5	
IBN		0.4	0.5	0.6	0.7	15	4.5	
IBN		0.4	0.5	0.6	0.7	18	5.5	
IBN		0.5	0.6	0.7	0.8	21	6.5	
IBN		0.5	0.6	0.7	0.8	25	9.0	

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

IBNS 1 Point Bend Type

Part Number	Type	Shape	T Selection	H	L 1mm Increment	B, C, D only	0.5mm Increment	5° Increment	Unit Price
							X	P	
IBNS	A	0.2	0.3	0.4	0.5	6	2.0	A+1.5≤P	10-90
IBNS	B	0.2	0.3	0.4	0.5	8	2.5		
IBNS	C	0.3	0.4	0.5	0.6	10	3.0		
IBNS	D	0.3	0.4	0.5	0.6	12	3.5		
IBNS		0.4	0.5	0.6	0.7	15	4.5		
IBNS		0.4	0.5	0.6	0.7	18	5.5		
IBNS		0.5	0.6	0.7	0.8	21	6.5		
IBNS		0.5	0.6	0.7	0.8	25	9.0		

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

IBNW 2 Point Bend Type

Part Number	Type	Shape	T Selection	H	1mm Increment	5° Increment	B, C, D only	0.5mm Increment	Unit Price
								X	
IBNW	A	0.2	0.3	0.4	0.5	6	2.0	A+1.5≤P	
IBNW	B	0.2	0.3	0.4	0.5	8	2.5		
IBNW	C	0.3	0.4	0.5	0.6	10	3.0		
IBNW	D	0.3	0.4	0.5	0.6	12	3.5		
IBNW		0.4	0.5	0.6	0.7	15	4.5		
IBNW		0.4	0.5	0.6	0.7	18	5.5		
IBNW		0.5	0.6	0.7	0.8	21	6.5		
IBNW		0.5	0.6	0.7	0.8	25	9.0		

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

Torsion Springs

Right Winding 90°

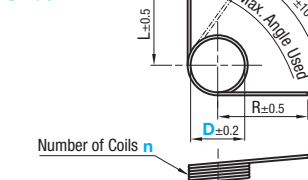


Left Winding 180°



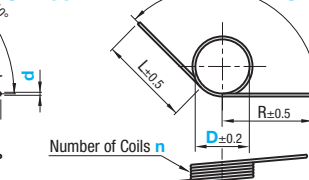
Arm Angle 90°

UA90R (Right Winding)
UA90L (Left Winding)



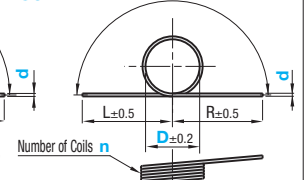
Arm Angle 135°

UA135R (Right Winding)
UA135L (Left Winding)



Arm Angle 180°

UA180R (Right Winding)
UA180L (Left Winding)



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

Material EN 1.4301 (WPB) Equiv.

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

Ordering Example: Part Number - n - d
UA90R4 - 3 - 0.5

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

Alterations Code	Arm Cut		Bend Left Arm	Bend Right Arm
	LC	RC	LBC	RBC
Spec.				
	Cuts arm down to the length of LC or RC. ☑ LC≥3, RC≥3 1mm Increment Ordering Code LC12		•LBC---Specifies the angle (see the diagram above) ☑ Select from LBC0, LBC90, LBC180 and LBC270. •LZ---Specifies the position (1mm increment) ☑ LZ≥3 L-LZ≥3 Ordering Code LBC90-LZ10	•RBC---Specifies the angle (see the diagram above) ☑ Select from RBC0, RBC90, RBC180 and RBC270. •RZ---Specifies the position (1mm increment) ☑ RZ≥3 R-RZ≥3 Ordering Code RBC90-RZ10