

# Tension Springs

-Hook Free-

CAD Data

**Hook Free Type**

Type	Material	
	Main Body	Hook Part
AWFM	JIS SWP-A	1.4301/X5CrNi18-10-WPB
AUFM	1.4301/X5CrNi18-10-WPB	1.4301/X5CrNi18-10-WPB

Part Number	Type	D-L	Wire Dia. dmm	Hooks Wire Dia. dmm	Hooks Inner Dia. V	Dynamic Load Max. Deflection Fmax. mm	Max. Load N	Initial Tension N	Springs Constant N/mm	€ Unit Price	
										AWFM	AUFM
7-25						8			3.92		
30		1.0	1.2	4.6		11.9	39.2	7.84	2.64		
35						16			1.96		
40						20			1.57		
8-30						9.6			5.88		
35						13.7			4.12		
40						18			3.13		
45		1.2	1.4	5.2		22.5	66.25	9.81	2.51		
50						25.15			2.24		
60						32.91			1.71		
70						40.68			1.39		
10-30						10.1			7.35		
35						13.8			5.39		
40						17.25			4.31		
45		1.4	1.6	6.8		23	86.69	12.4	3.23		
50						27.16			2.74		
60						36.72			2.02		
70						46.28			1.61		
80						55.85			1.33		
12-30						8.7			9.99		
35						13.6			6.37		
40						19.2			4.50		
45						26			3.33		
50		1.6	1.8	8.4		28.93	101.29	14.71	2.99		
60						34.78			2.49		
70						44.89			1.93		
80						54.99			1.57		
90						65.10			1.33		
100						75.21			1.15		

Part Number	Type	D-L	Wire Dia. dmm	Hooks Wire Dia. dmm	Hooks Inner Dia. V	Dynamic Load Max. Deflection Fmax. mm	Max. Load N	Initial Tension N	Springs Constant N/mm	€ Unit Price	
										AWFM	AUFM
14-50						18.20			4.69		
60						27.13			3.14		
70						36.05			2.37		
80		1.8	2	10		44.97	107.87	22.56	1.90		
90						53.90			1.58		
100						62.82			1.36		
125						85.13			1.00		
16-50						15.54			6.53		
60						25.01			4.06		
70						34.48			2.94		
80		2	2.6	11.4		43.96	127	25.5	2.31		
90						53.43			1.90		
100						62.90			1.61		
125						86.59			1.17		
18-80						39.58			3.64		
90						49.00			2.94		
100		2.3	2.9	12.9		58.43	180	36	2.46		
125						81.99			1.76		
150						105.55			1.36		
20-80						32.48			5.51		
90						41.12			4.35		
100						49.76			3.60		
125						71.36			2.51		
150						92.96			1.93		

Please note that Hook Wire Dia. for D16, 18, 20 are thicker. Inner diameter is the same as the previous type.

**Order Example** Part Number: **AWFM8-30**

**Days to Ship** **6 Days** P88

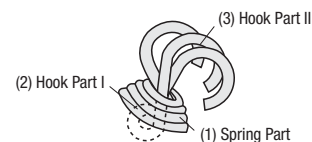
**Price** Volume Discount (Round down to one Cent.) P87

Quantity	1-19	20-34	35-49	50-100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

### Features

Being separate from the spring body, the hook can move flexibly as desired. In addition, direct contact between the spring and the hook does not generate bending stress in the hook, which is not possible with conventional tension springs.



# Tension Springs / Hooks

-Long, Medium Load · Hook Insertion-

CAD Data

**Tension Springs**  
-Long, Medium Load-

Type	Material	
	LWS	LUS
	JIS SWP-A	1.4301/X5CrNi18-10-WPB

**Hooks**

Type	Material	Surface Treatment	
		HBFKN	HBFKS
	1.0330/DC01	Black Oxide	-
	1.4301/X5CrNi18-10	-	-

**Order Example** Part Number: **LWS10-50 HBFKN10**

**Days to Ship** **6 Days** P88

**Price** Volume Discount (Round down to one Cent.) P88

Quantity	1-24	25-34	35-49	50-100
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

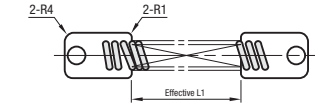
Part Number	Type	D-L	Springs Constant N/mm	Wire Dia. dmm	Initial Tension N	Max. Deflection %	Applicable Hooks	€ Unit Price	
								LWS	LUS
5-500			0.020	0.6	1.57		HBFK_5		
6-500			0.050	0.8	3.53		HBFK_6		
8-500			0.060	1.0	4.9		HBFK_8		
10-500			0.075	1.2	5.49		HBFK_10		
12-500			0.190	1.6	14.71		HBFK_12		
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 x 0.101972

Part Number	Type	No.	W	A	B	P	L1	L2	H	T	l1	l2	€ Unit Price	
													HBFKN	HBFKS
5		4.1	5	1.0	2.0	24	6	10	1.0	2.0				
6		4.9	6	1.5	2.6	26	7	15	1.0	1.5	2.8			
8		6.6	6	1.5	2.6	26	7	15	1.0	1.5	2.8			
10		8.4	6	1.5	2.6	26	7	15	1.0	1.5	2.8			
12		9.9	7	2.2	3.2	30	7.5	18	2.0	2.3	3.6			
14		12.2	7	2.2	3.2	30	7.5	18	2.0	2.3	3.6			
16		14.0	9	2.5	4.0	34	8.5	22	2.5	2.5	4.5			
18		15.7	9	2.9	4.6	34	8.5	22	2.9	2.9	5.2			

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

### 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 L/L1 times.

**Tension Springs**  
-Hook Insertion-

Type	Springs	Material	Surface Treatment	
			Hooks	Hooks
LWSH	JIS SWP-A	1.0330/DC01	Black Oxide	-
LUSH	1.4301-WPB	1.4301/X5CrNi18-10	-	-

Part Number	Type	Shape	D	L	Wire Dia. dmm	A	H	Max. Deflection %	L1	Initial Tension (N)				Standard Spring Constant (N/mm)			
										LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH
5		A	5	200	0.6	5	10	70	L+36	1.01	1.32	0.045	0.040				
6		A	6	200	2.28	2.96	0.114	0.101	L+38	3.04	4.26	0.145	0.128				
8		A	8	200	4.31	6.03	0.183	0.163	L+38	4.31	6.03	0.183	0.163				
10		A	10	200	1.6	7	18	60	L+45	8.72	12.21	0.470	0.415				
12		A	12	200	1.8	20	20	60	L+45	10.6	14.84	0.525	0.465				
14		A	14	200	2.0	22	22	60	L+51	12.6	17.64	0.593	0.525				
16		A	16	200	2.3	25	25	60	L+51	18.7	26.18	0.850	0.753				

JIS SWP-A comes with the 1.0330/DC01 hook, and 1.4301/X5CrNi18-10-WPB comes with the 1.4301/X5CrNi18-10 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.

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) = 200 (Reference L Dimension) / Configurable L Dimension x Standard Spring Constant

Ex. LWSHB-8-400 = 200 / 0.0725(N/mm) = 400 x 0.145 = 28.9 kgf = Nx0.101972

**Order Example** Part Number: **LWSHA - 5 - 500**

**Days to Ship** **10 Days** P88

**Price** Volume Discount (Round down to one Cent.) P87

Quantity	1-10	11-14	15-20	21-30
Discount Rate	€ Unit Price	5%	10%	18%

For orders larger than indicated quantity, please request a quotation.

D	L200-250		L260-300		L310-350		L360-400		L410-450		L460-500	
	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH
5												
6												
8												
10												
12												
14												
16												
18												

D	L200-250		L260-300		L310-350		L360-400		L410-450		L460-500	
	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH	LWSH	LUSH
5												
6												
8												
10												
12												
14												
16												
18												