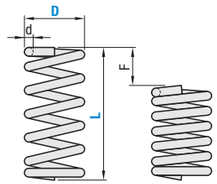
Round Wire Springs

UBB: Outer Diameter Selectable, Stainless Steel

Round Wire Springs – Outer Diameter Selectable Stainless Steel

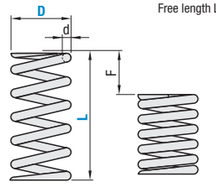
RoHS 10

UBB*



Closed Ends (Both Ends Not Ground*)

UBB



Closed Ends (Both Ends Ground)

Spring Constant	±10%
Outer Diameter D	Ø10 or less $^{0}_{-0.5mm}$
	Ø12 or more $^{0}_{-0.8mm}$
Free length L	50 or less ±1.5 mm
	55 or more±2.5 mm

Material: 304 Stainless Steel-WPB

UBB: Fmax. (Allowable Deflection)= L x Fa%

Part Number Type	D - L	d	Solid Length	F max.	N{kgf} max.		Fa%
UBB	4 - 5*	0.55	3.3	1.25	6.1	{0.63}	25
	10	0.65	7.0	2.5	12.3	{ 1.3}	
	15	0.7	10.3	3.75	18.4	{ 1.9}	
	20	0.75	14.4	5	24.5	{ 2.5}	
	25	0.8	19.4	5	24.5	{ 2.5}	20
UBB	5 - 5	0.6	2.9	1.25	6.1	{0.63}	25
	10	0.75	6.9	2.5	12.3	{ 1.3}	
	15	0.8	9.8	3.75	18.4	{ 1.9}	
	20	0.85	13.4	5	24.5	{ 2.5}	
	25	0.9	17.8	6.25	30.6	{ 3.1}	
	30	0.9	21.8	7.5	36.8	{ 3.8}	
UBB	6 - 5	0.8	3.6	1.25	12.3	{ 1.3}	25
	10	0.9	6.8	2.5	24.5	{ 2.5}	
	15	1	10.5	3.75	36.8	{ 3.8}	
	20	1.1	14.6	5	49.0	{ 5.0}	
	25	1.1	17.9	6.25	61.3	{ 6.3}	
	30	1.2	23.1	6	58.8	{ 6.0}	
	35	1.2	27.3	7	68.6	{ 7.0}	
	40	1.2	31.2	8	78.5	{ 8.0}	20
	45	1.3	34.8	9	88.3	{ 9.0}	
	50	1.3	38.4	10	98.1	{10.0}	
	60	1.3	44.2	9	88.3	{ 9.0}	15
	70	1.4	58.5	10.5	103	{10.5}	
UBB	8 - 10	1.1	6.9	2.5	24.5	{ 2.5}	25
	15	1.2	9.9	3.75	36.8	{ 3.8}	
	20	1.3	14.0	5	49.0	{ 5.0}	
	25	1.3	14.5	6.25	61.3	{ 6.3}	
	30	1.4	21.4	7.5	73.5	{7.5}	
	35	1.4	22.0	8.75	85.8	{ 8.8}	
	40	1.5	28.9	10	98.1	{10.0}	
	45	1.5	32.6	11.25	110	{11.3}	
UBB	10 - 10	1.3	7.2	2.5	24.5	{ 2.5}	25
	15	1.4	10.2	3.75	36.8	{ 3.8}	
	20	1.5	13.9	5	49.0	{ 5.0}	
	25	1.5	16.1	6.25	61.3	{ 6.3}	
	30	1.6	20.4	7.5	73.5	{7.5}	
	35	1.6	22.8	8.75	85.8	{ 8.8}	
	40	1.7	27.2	10	98.1	{10.0}	
	45	1.7	30.6	11.25	110	{11.3}	
	50	1.8	36.5	12.5	123	{12.5}	
	60	1.8	41.4	15	147	{15.0}	
	70	1.9	50.8	17.5	172	{17.5}	
UBB	12 - 15	1.5	9.4	3.75	36.8	{ 3.8}	25
	20	1.6	12.4	5	49.0	{ 5.0}	
	25	1.7	16.2	6.25	61.3	{ 6.3}	
	30	1.8	20.3	7.5	73.5	{7.5}	
	40	1.9	28.0	10	98.1	{10.0}	
	50	2	35.5	12.5	123	{12.5}	
	60	2.1	43.6	15	147	{15.0}	
	70	2.1	48.8	17.5	172	{17.5}	
	80	2.2	58.5	20	196	{20.0}	

Part Number Type	D - L	d	Solid Length	F max.	N{kgf} max.		Fa%
UBB	13 - 15	1.8	9.5	3.75	73.5	{7.5}	25
	20	1.9	12.9	5	98.1	{10.0}	
	25	2	17.0	6.25	123	{12.5}	
	30	2.1	20.5	7.5	147	{15.0}	
	40	2.3	28.2	10	196	{20.0}	
	45	2.3	32.2	11.25	221	{22.5}	
	50	2.4	36.0	12.5	245	{25.0}	
	60	2.5	44.4	12	235	{24.0}	20
	70	2.6	54.0	14	275	{28.0}	
UBB	14 - 15	1.9	10.0	3.75	73.5	{7.5}	25
	20	2	13.5	5	98.1	{10.0}	
	25	2.1	16.3	6.25	123	{12.5}	
	30	2.3	21.3	7.5	147	{15.0}	
	35	2.3	24.7	8.75	172	{17.5}	
	40	2.4	28.2	10	196	{20.0}	
	60	2.6	43.6	15	294	{30.0}	
	80	2.7	61.4	16	314	{32.0}	20

Part Number Type	D - L	d	Solid Length	F max.	N{kgf} max.		Fa%
UBB	16 - 15	2	10.0	3.75	73.5	{7.5}	25
	20	2.1	12.1	5	98.1	{10.0}	
	25	2.3	17.3	6.25	123	{12.5}	
	30	2.4	21.0	7.5	147	{15.0}	
	35	2.5	24.4	8.75	172	{17.5}	
	40	2.6	28.0	10	196	{20.0}	
	45	2.7	31.7	11.25	221	{22.5}	
	50	2.7	35.8	12.5	245	{25.0}	
	60	2.9	43.5	15	294	{30.0}	
	70	2.9	49.4	17.5	343	{35.0}	
	80	3	59.3	16	314	{32.0}	20
UBB	20 - 25	2.9	16.7	6.25	184	{18.8}	25
	30	3	20.3	7.5	221	{22.5}	
	35	3	22.7	8.75	257	{26.3}	
	40	3.2	27.2	10	294	{30.0}	
	45	3.2	29.6	9	265	{27.0}	
	50	3.4	38.3	10	294	{30.0}	20
	60	3.5	44.6	12	353	{36.0}	

kgf (Load)=N/mm (Spring Constant) x 0.101972 x F (Deflection)

{kgf}=Nx0.101972

- For Types marked with *, both ends are not ground.
- The values of solid length are for reference only. There may be some variations depending on the lot.
- Operation frequency: One million times

Spring Constant N/mm {kgf/mm}

D \ Type	UV	UY	UR	UF	UL	UTT	UM	UH	UBB
2	0.05 {0.005}	0.05{0.005}	0.2{0.02}	0.3{0.03}	0.5{0.05}				
3									
4		0.098 {0.01}				1.5 {0.15}	2.0{0.2}	2.9{0.3}	4.9{0.5}
5			0.29 {0.03}	0.49 {0.05}	0.98 {0.1}				
6									
8								5.9 {0.6}	9.8 {1.0}
10		0.2 {0.02}				2.0 {0.2}	2.9 {0.3}		
12									
13								9.8 {1.0}	19.6 {2.0}
14									
16									
20		0.3(0.03)	0.5(0.05)	0.98(0.1)	2.9(0.3)	3.9(0.4)	4.9(0.5)	14.7(1.5)	29.4(3.0)
Fmax.	F=Lx70%	F=LxFa%	F=LxFa%	F=Lx45%	F=Lx40%	F=LxFa%	F=LxFa%	F=LxFa%	F=LxFa%

D12 is applicable to UY, UR, UF and UBB Types only. D14 is applicable to UBB Type only.

Part Number Example

Part Number
UBB16-80

Round Wire Springs

L Dimension Configurable

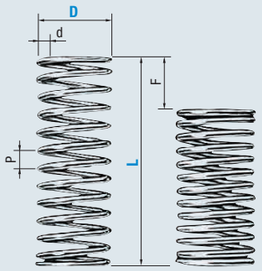
Round Wire Springs – L Dimension Configurable / Outer Diameter Selectable Stainless Steel

Compression Springs

Type	Allowable Deflection	Material
FWR	F=Lx60%	Spring Steel (ASTM A228)
FWF	F=Lx50%	
FWT	F=Lx40%	
FUR	F=Lx60%	304 Stainless Steel-WPB
FUF	F=Lx50%	
FUT	F=Lx40%	

- Use within the range of allowable deflection %.
- No grinding on both ends for d less than 0.9.
- P is for reference only.
- Load types A and B have a different number of coils, so the P dimension is different.

RoHS 10



How to Calculate Spring Constant

$$\text{Spring Constant} = \frac{\text{Max.Load (N(kgf))}}{\text{Lx Allowable Deflection (\%)}}$$

D Tolerance	Ø5~14	±0.3
	Ø16~20	±0.4
L Tolerance	~50	±1
	51~100	±2
	101~200	±4

Part Number Type	D	1mm Increment L	Load Type Selection	Max. Load N{kgf} Spring Steel (ASTM A228) FWR60%	FWF50%	FWT40%	304 Stainless Steel FUR60%	FUF50%	FUT40%	d FWR FUR	FWF FUF	FWT FUT	P (Reference) FWR FUR	FWF FUF	FWT FUT
FWR FWF FWT (Spring Steel (ASTM A228)) FUR FUF FUT (Spring Steel (ASTM A228))	5	15–65	A	2.8{0.29}	5.2{0.53}	8.1{0.83}	2.5{0.25}	4.5{0.46}	7.1{0.73}	0.4	0.5	0.6	1.8	1.5	1.3
			B	3.7{0.38}	6.7{0.69}	10.6{1.08}	3.3{0.33}	5.9{0.60}	9.3{0.95}				2.3	1.9	1.7
	6	15–80	A	2.9{0.30}	7.3{0.75}	9.9{1.01}	2.5{0.26}	6.4{0.65}	8.7{0.89}	0.45	0.6	0.7	2.0	1.7	1.5
			B	3.8{0.38}	9.6{0.97}	12.9{1.32}	3.3{0.34}	8.4{0.85}	11.3{1.15}				2.6	2.3	1.9
	7	15–90	A	3.1{0.32}	10.1{1.03}	11.5{1.17}	2.7{0.28}	8.8{0.90}	10.0{1.02}	0.5	0.7	0.8	2.2	2.0	1.7
			B	4.0{0.41}	13.1{1.34}	14.9{1.52}	3.5{0.36}	11.5{1.17}	13.0{1.33}				2.9	2.7	2.2
	8	20–100	A	5.2{0.53}	12.2{1.24}	13.8{1.41}	4.6{0.47}	10.7{1.09}	12.1{1.23}	0.6	0.8	0.9	2.7	2.2	1.9
			B	6.8{0.70}	15.9{1.62}	17.9{1.83}	6.0{0.61}	13.9{1.42}	15.7{1.60}				3.5	2.9	2.4
	9	19–110	A	8.1{0.83}	17.4{1.78}	22.1{2.25}	7.1{0.72}	15.2{1.56}	19.3{1.97}	0.7	0.9	1.0	2.9	2.5	2.6
			B	10.0{1.02}	20.6{2.09}	27.5{2.80}	8.7{0.89}	17.9{1.83}	24.0{2.45}				3.5	2.9	3.3
	10	20–120	A	10.6{1.08}	19.2{1.96}	30.5{3.11}	9.3{0.95}	16.9{1.72}	26.7{2.72}	0.8	1.0	1.2	3.4	2.8	2.5
			B	13.7{1.40}	24.9{2.54}	39.5{4.03}	12.1{1.23}	21.8{2.22}	34.6{3.53}				4.4	3.6	3.2
	11	21–130	A	9.0{0.92}	17.2{1.75}	27.9{2.85}	7.9{0.80}	15.0{1.53}	24.4{2.49}	0.8	1.0	1.2	3.5	3.3	2.9
			B	12.6{1.28}	22.9{2.33}	36.3{3.70}	11.0{1.12}	20.0{2.04}	31.7{3.24}				4.9	4.3	3.8
	12	25–140	A	11.0{1.12}	27.6{2.81}	37.7{3.84}	9.6{0.98}	24.1{2.46}	33.0{3.34}	0.9	1.2	1.4	3.8	3.3	2.9
			B	14.2{1.45}	35.8{3.65}	48.9{4.99}	12.5{1.27}	31.3{3.19}	42.9{4.37}				4.9	4.3	3.8
	13	24–150	A	10.5{1.07}	26.5{2.70}	35.7{3.63}	9.1{0.93}	23.2{2.37}	31.1{3.18}	0.9	1.2	1.4	4.2	3.9	3.3
			B	13.4{1.37}	34.6{3.52}	46.4{4.73}	11.7{1.20}	30.2{3.08}	40.5{4.13}				5.5	5.1	4.3
	14	30–160	A	11.6{1.18}	37.7{3.84}	45.9{4.68}	10.1{1.03}	33.0{3.36}	40.2{4.10}	1.0	1.4	1.6	4.2	3.9	3.3
			B	15.1{1.54}	48.9{4.99}	59.6{6.08}	13.1{1.34}	42.8{4.36}	52.2{5.32}				5.5	5.1	4.3
	15	27–170	A	11.4{1.16}	36.8{3.75}	44.4{4.53}	9.9{1.01}	32.1{3.28}	38.8{3.96}	1.0	1.4	1.6	5.0	4.5	3.7
			B	14.9{1.51}	47.1{4.80}	56.6{5.77}	14.9{1.33}	41.1{4.20}	49.4{5.05}				6.5	5.8	4.8
	16	30–180	A	19.4{1.98}	49.7{5.07}	55.1{5.62}	17.0{1.73}	43.4{4.43}	48.2{4.91}	1.2	1.6	1.8	5.0	4.5	3.7
			B	25.1{2.56}	64.5{6.58}	71.2{7.26}	22.0{2.24}	56.5{5.76}	62.6{6.38}				6.5	5.8	4.8
	17	31–190	A	19.6{2.00}	47.9{4.88}	53.5{5.45}	17.1{1.75}	41.8{4.27}	46.7{4.77}	1.2	1.6	1.8	5.9	5.0	4.1
			B	25.3{2.57}	62.0{6.32}	69.9{7.13}	22.0{2.25}	54.1{5.53}	61.0{6.24}				7.7	6.5	5.4
	18	35–200	A	29.9{3.05}	62.1{6.33}	65.2{6.65}	26.2{2.67}	54.3{5.54}	57.1{5.82}	1.4	1.8	2.0	5.9	5.0	4.1
			B	38.9{3.97}	80.7{8.23}	84.6{8.63}	34.0{3.47}	70.6{7.2}	74.0{7.55}				7.7	6.5	5.4
	20	40–200	A	42.7{4.35}	76.9{7.84}	99.0{10.1}	37.4{3.81}	67.3{6.86}	86.6{8.83}	1.6	2.0	2.3	6.7	5.5	4.8
			B	55.2{5.63}	100 {10.2}	128 {13.1}	48.3{4.93}	87.2{8.89}	113 {11.5}				8.7	7.2	6.3
	23	45–200	A	51.9{5.29}	103.0{10.50}	121.0{12.34}	45.4{4.63}	90.2{9.20}	106.0{10.81}	1.8	2.3	2.6	7.8	6.4	5.5
			B	67.4{6.87}	133.0{13.56}	156.0{15.91}	58.9{6.01}	113.0{11.52}	137.0{13.97}				10.1	8.1	7.1
	25	50–250	A	64.5{6.58}	153.5{15.64}	178.6{18.20}	56.3{5.75}	133.9{13.68}	155.9{15.93}	2.0	2.6	2.9	7.8	7.1	6.3
			B	82.4{8.39}	172.0{17.53}	214.3{21.84}	71.9{7.34}	150.1{15.34}	187.0{19.11}				10.2	8.0	7.9
	27	70–250	A	86.0{8.77}	195.0{19.87}	220.3{22.45}	75.0{7.67}	170.2{17.39}	192.3{19.64}	2.3	2.9	3.2	7.5	7.4	6.7
			B	110.9{11.30}	214.2{21.83}	274.0{27.92}	96.8{9.89}	187.0{19.10}	239.1{24.43}				9.6	8.1	8.6

Part Number Type	D	Available types L15–40	L41–80	L81–120	L121–160	L161–200
FWR FWF FWT (Spring Steel (ASTM A228))	5	•	•	—	—	—
	6	•	•	—	—	—
	7	•	•	•	—	—
	8	•	•	•	—	—
	9	•	•	•	—	—
	10	•	•	•	—	—
	11	•	•	•	•	—
	12	•	•	•	•	—
	13	•	•	•	•	—
	14	•	•	•	•	—
	15	•	•	•	•	•
	16	•	•	•	•	•
	17	•	•	•	•	•
	18	•	•	•	•	•
	20	•	•	•	•	•
	23	—	•	•	•	•
	25	—	•	•	•	•
	27	—	•	•	•	•

Part Number Type	D	Available types L15–40	L41–80	L81–120	L121–160	L161–200
FUR FUF FUT (Spring Steel (ASTM A228))	5	•	•	—	—	—
	6	•	•	—	—	—
	7	•	•	•	—	—
	8	•	•	•	—	—
	9	•	•	•	—	—
	10	•	•	•	—	—
	11	•	•	•	•	—
	12	•	•	•	•	—
	13	•	•	•	•	—
	14	•	•	•	•	—
	15	•	•	•	•	•
	16	•	•	•	•	•
	17	•	•	•	•	•
	18	•	•	•	•	•
	20	•	•	•	•	•
	23	—	•	•	•	•
	25	—	•	•	•	•
	27	—	•	•	•	•

Part Number Example

Part Number	-	L	-	Load Type A / B
FWF10		- 119 -		A