

# CONSTANT FORCE SPRINGS

## Guide to using tables

**Width**  
is the width of material used to make a spring.

**Lee Stock Number**  
ordering reference.

**Life Cycles**  
is the number of times a spring can be loaded and unloaded between two points without permanently changing its properties.

**Thickness**  
is the thickness of material used to make a spring.

**Length**  
is the length of a spring fully unwound.

**Inside Diameter**  
is the natural inside diameter of a spring before assembling with a drum.

**Price Group**  
reference to price list.

**Load**  
is the force applied to a spring that causes a deflection.

**Drum Diameter**  
is the outside diameter of a drum/shaft over which a spring fits firmly.

**Working Deflection**  
is the deflection to which a spring can be safely subjected to without permanently changing its properties.

**Initial Deflection**  
is the minimum deflection of a spring needed to attain the specified load.

### CONSTANT FORCE SPRINGS

● Stainless Steel 301

LEE STOCK NUMBER	LIFE CYCLES	THICKNESS (T)		WIDTH		LENGTH		INITIAL DEFLECTION (I)		WORKING DEFLECTION (W)		INSIDE DIAMETER (ID)		DRUM DIAMETER (DD)		LOAD (P)		PRICE GROUP	
		MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	N	LB		
2500																			
LCF 025 04 025S	2500	0.10	0.004	6.35	0.250	355.6	14	13.2	0.520	304.8	12	8.64	0.297	8.86	0.349	2.94	0.66	Y	
LCF 025 05 031S		0.13	0.005	7.92	0.312	381.0	15	16.5	0.650	330.3	12	9.91	0.359	11.07	0.436	3.65	1.03	Y	
LCF 025 06 038S		0.15	0.006	9.53	0.375	533.4	21	19.8	0.780	457.2	18	11.13	0.438	13.28	0.523	6.52	1.48	Y	
LCF 025 08 050S		0.15	0.006	12.70	0.500	533.4	21	19.8	0.780	457.2	18	11.13	0.438	13.28	0.523	6.52	1.48	Z	
LCF 025 10 063S		0.20	0.008	12.70	0.500	711.2	28	28.9	1.050	609.6	24	14.68	0.574	17.70	0.697	11.70	2.63	BC	
LCF 025 12 075S		0.25	0.010	15.88	0.625	736.6	29	33.3	1.310	609.6	24	18.64	0.734	22.17	0.873	18.33	4.12	BG	
LCF 025 12 100S		0.30	0.012	19.05	0.750	914.4	36	39.6	1.560	762.0	30	22.23	0.875	26.67	1.050	26.42	5.94	BH	
LCF 025 15 100S		0.30	0.012	25.40	1.000	914.4	36	39.6	1.560	762.0	30	22.23	0.875	26.67	1.050	35.23	7.92	BH	
LCF 025 18 125S		0.41	0.016	25.40	1.000	965.2	38	53.3	2.100	762.0	30	29.51	1.156	35.56	1.400	47.15	10.60	BW	
LCF 025 20 125S		0.51	0.020	31.75	1.250	1193.8	47	66.0	2.600	914.4	36	37.31	1.469	44.45	1.700	73.40	16.50	CD	
4000																			
LCF 040 04 025S	4000	0.10	0.004	6.35	0.250	381.0	15	15.5	0.610	304.8	12	8.64	0.360	10.16	0.400	2.22	0.50	Z	
LCF 040 05 031S		0.13	0.005	7.92	0.312	431.8	17	19.1	0.750	304.8	12	9.40	0.373	12.70	0.500	3.58	1.03	Z	
LCF 040 06 038S		0.15	0.006	9.53	0.375	609.6	24	23.9	0.940	457.2	18	11.43	0.450	15.75	0.620	5.17	1.48	Z	
LCF 040 08 050S		0.15	0.006	12.70	0.500	635.0	25	24.6	0.970	457.2	18	11.43	0.450	15.75	0.620	6.76	1.97	BA	
LCF 040 10 063S		0.20	0.008	12.70	0.500	762.0	30	31.5	1.240	609.6	24	14.99	0.590	20.31	0.820	11.70	2.63	BC	
LCF 040 12 075S		0.25	0.010	15.88	0.625	838.2	33	37.8	1.490	609.6	24	18.54	0.730	26.15	0.950	18.33	4.12	BG	
LCF 040 12 100S		0.30	0.012	19.05	0.750	990.6	39	45.5	1.790	762.0	30	22.35	0.880	30.23	1.000	26.42	5.94	BG	
LCF 040 15 100S		0.30	0.012	25.40	1.000	990.6	39	45.7	1.800	762.0	30	22.35	0.880	30.48	1.250	35.23	7.92	BY	
LCF 040 18 125S		0.41	0.016	25.40	1.000	1016.0	40	57.9	2.280	762.0	30	30.48	1.200	38.61	1.520	47.15	10.60	BR	
LCF 040 20 125S		0.51	0.020	31.75	1.250	1270.0	50	71.9	2.830	914.4	36	37.34	1.470	48.01	1.890	40.15	16.50	BY	
13000																			
LCF 130 04 025S	13000	0.10	0.004	6.35	0.250	381.0	15	20.3	0.800	304.8	12	11.13	0.438	13.54	0.533	3.00	0.32	Z	
LCF 130 05 031S		0.13	0.005	7.92	0.312	406.4	16	25.4	1.000	304.8	12	14.30	0.563	16.89	0.665	2.18	0.49	Z	
LCF 130 06 038S		0.15	0.006	9.53	0.375	584.2	23	30.5	1.200	457.2	18	17.07	0.672	20.27	0.798	3.16	0.71	BA	
LCF 130 08 050S		0.15	0.006	12.70	0.500	584.2	23	30.5	1.200	457.2	18	17.07	0.672	20.27	0.798	4.23	0.93	BA	
LCF 130 08 050S		0.20	0.008	12.70	0.500	762.0	30	40.4	1.590	609.6	24	22.23	0.875	26.92	1.060	5.60	1.28	BG	
LCF 130 10 063S		0.25	0.010	15.88	0.625	812.8	32	50.8	2.000	609.6	24	28.17	1.109	33.78	1.330	8.81	1.98	BM	
LCF 130 12 075S		0.30	0.012	19.05	0.750	1016.0	40	60.5	2.380	762.0	30	34.14	1.344	40.39	1.590	12.63	2.84	BM	
LCF 130 12 100S		0.30	0.012	25.40	1.000	1016.0	40	60.5	2.380	762.0	30	34.14	1.344	40.39	1.590	16.86	3.79	BO	
LCF 130 15 100S		0.38	0.015	25.40	1.000	1066.8	42	75.7	2.980	762.0	30	42.47	1.672	50.55	1.990	21.08	4.74	BW	
LCF 130 20 125S		0.51	0.020	31.75	1.250	1320.8	52	100.8	3.970	914.4	36	56.36	2.219	67.31	2.650	42.17	9.48	CE	
25000																			
LCF 250 04 025S	25000	0.10	0.004	6.35	0.250	558.8	22	22.4	0.880	457.2	18	13.46	0.530	14.99	0.590	1.02	0.23	Z	
LCF 250 05 038S		0.13	0.005	9.53	0.375	736.6	29	27.7	1.050	609.6	24	16.51	0.650	18.54	0.730	1.91	0.43	BA	
LCF 250 06 038S		0.15	0.006	9.53	0.375	762.0	30	33.0	1.300	609.6	24	19.56	0.770	21.84	0.860	2.31	0.52	BA	
LCF 250 06 050S		0.15	0.006	12.70	0.500	762.0	30	34.5	1.360	609.6	24	20.32	0.800	22.96	0.900	3.11	0.70	BB	
LCF 250 08 050S		0.20	0.008	12.70	0.500	965.2	38	45.7	1.800	762.0	30	27.18	1.070	30.48	1.200	4.14	0.93	BG	
LCF 250 10 063S		0.25	0.010	15.88	0.625	1016.0	40	57.9	2.280	762.0	30	34.54	1.360	38.61	1.520	6.49	1.46	BG	
LCF 250 12 075S		0.30	0.012	19.05	0.750	1219.2	48	68.3	2.690	914.4	36	40.64	1.600	45.47	1.790	9.30	2.09	BM	
LCF 250 12 100S		0.30	0.012	25.40	1.000	1219.2	48	68.3	2.690	914.4	36	40.64	1.600	45.47	1.790	12.46	2.80	BO	
LCF 250 15 100S		0.38	0.015	25.40	1.000	1422.4	56	83.8	3.300	1066.8	42	49.78	1.960	55.88	2.200	15.57	3.50	BW	
LCF 250 20 125S		0.51	0.020	31.75	1.250	1524.0	60	108.0	4.250	1066.8	42	64.26	2.530	71.88	2.830	25.93	5.83	CE	

### ADDITIONAL INFORMATION

Manufactured from high yield 301 stainless steel strip our constant force springs exert a near constant restraining force to resist uncoiling. This natural inbuilt stress resists load at an even rate and so makes the springs suitable for use in retractor mechanisms. Common applications include counterbalance springs, car seat belt and cable retractors.

Four life cycle ranges are offered: 2,500, 4,000, 13,000 and 25,000 covering loads from 1.02 to 73.42N (0.23 to 16.50lb).

#### Mounting

Constant force springs are generally tightly coiled on a drum with either the free end or the drum attached to the load. This relationship can also be reversed.

Important points to note:

- 1 The drum diameter should be 10 to 20% larger than the inside diameter of the spring.
- 2 A minimum of one and one-half coils should remain on the drum at maximum extension.
- 3 The strip from which these springs are manufactured becomes unstable at long extensions and so should be guided to prevent twisting or kinking on recoil.
- 4 Idler pulleys must be larger in diameter than the natural diameter and should never be used to cause back-bending against the natural radius of curvature.

$L_f$  = Initial deflection to reach related load  
 $W_f$  = Max. working deflection

Lee Spring®

leespring.co.uk • Call: +44 (0)118 978 1800 • Fax: +44 (0)118 977 4832 • Email: sales@leespring.co.uk

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# CONSTANT FORCE SPRINGS



## ● Stainless Steel 301

LEE STOCK NUMBER	LIFE CYCLES	THICKNESS (T)		WIDTH (W)		LENGTH		INITIAL DEFLECTION (If)		WORKING DEFLECTION (Wf)		INSIDE DIAMETER (ID)		DRUM DIAMETER (DD)		LOAD (P) +/- 20%		PRICE GROUP
		MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	N	LB	
LCF 025 04 025S	2500	0.10	0.004	6.35	0.250	355.6	14	13.2	0.520	304.8	12	7.54	0.297	8.86	0.349	2.94	0.66	Y
LCF 025 05 031S		0.13	0.005	7.92	0.312	381.0	15	16.5	0.650	304.8	12	9.12	0.359	11.07	0.436	4.58	1.03	Y
LCF 025 06 038S		0.15	0.006	9.53	0.375	533.4	21	19.8	0.780	457.2	18	11.13	0.438	13.28	0.523	6.58	1.48	Y
LCF 025 06 050S		0.15	0.006	12.70	0.500	533.4	21	19.8	0.780	457.2	18	11.13	0.438	13.28	0.523	8.76	1.97	Z
LCF 025 08 050S		0.20	0.008	12.70	0.500	711.2	28	26.9	1.060	609.6	24	14.68	0.578	17.70	0.697	11.70	2.63	BC
LCF 025 10 063S		0.25	0.010	15.88	0.625	736.6	29	33.3	1.310	609.6	24	18.64	0.734	22.17	0.873	18.33	4.12	BG
LCF 025 12 075S		0.30	0.012	19.05	0.750	914.4	36	39.6	1.560	762.0	30	22.23	0.875	26.67	1.050	26.42	5.94	BG
LCF 025 12 100S		0.30	0.012	25.40	1.000	914.4	36	39.6	1.560	762.0	30	22.23	0.875	26.67	1.050	35.23	7.92	BH
LCF 025 16 100S		0.41	0.016	25.40	1.000	965.2	38	53.3	2.100	762.0	30	29.36	1.156	35.56	1.400	47.15	10.60	BW
LCF 025 20 125S	0.51	0.020	31.75	1.250	1193.8	47	66.0	2.600	914.4	36	37.31	1.469	44.45	1.750	73.40	16.50	CD	
LCF 040 04 025S	4000	0.10	0.004	6.35	0.250	381.0	15	15.5	0.610	304.8	12	8.64	0.340	10.16	0.400	2.22	0.50	Z
LCF 040 05 031S		0.13	0.005	7.92	0.312	431.8	17	19.1	0.750	304.8	12	9.40	0.370	12.70	0.500	4.58	1.03	Z
LCF 040 06 038S		0.15	0.006	9.53	0.375	609.6	24	23.9	0.940	457.2	18	11.43	0.450	15.75	0.620	6.58	1.48	Z
LCF 040 06 050S		0.15	0.006	12.70	0.500	635.0	25	24.6	0.970	457.2	18	11.43	0.450	16.51	0.650	8.76	1.97	BA
LCF 040 08 050S		0.20	0.008	12.70	0.500	762.0	30	31.5	1.240	609.6	24	14.99	0.590	20.83	0.820	11.70	2.63	BC
LCF 040 10 063S		0.25	0.010	15.88	0.625	838.2	33	37.8	1.490	609.6	24	18.54	0.730	25.15	0.990	18.33	4.12	BG
LCF 040 12 075S		0.30	0.012	19.05	0.750	990.6	39	45.5	1.790	762.0	30	22.35	0.880	30.23	1.190	26.42	5.94	BG
LCF 040 12 100S		0.30	0.012	25.40	1.000	990.6	39	45.7	1.800	762.0	30	22.35	0.880	30.48	1.200	35.23	7.92	BJ
LCF 040 16 100S		0.41	0.016	25.40	1.000	1016.0	40	57.9	2.280	762.0	30	30.48	1.200	38.61	1.520	47.15	10.60	BR
LCF 040 20 125S	0.51	0.020	31.75	1.250	1270.0	50	71.9	2.830	914.4	36	37.34	1.470	48.01	1.890	73.40	16.50	BY	
LCF 130 04 025S	13000	0.10	0.004	6.35	0.250	381.0	15	20.3	0.800	304.8	12	11.13	0.438	13.54	0.533	1.42	0.32	Z
LCF 130 05 031S		0.13	0.005	7.92	0.312	406.4	16	25.4	1.000	304.8	12	14.30	0.563	16.89	0.665	2.18	0.49	Z
LCF 130 06 038S		0.15	0.006	9.53	0.375	584.2	23	30.5	1.200	457.2	18	17.07	0.672	20.27	0.798	3.16	0.71	BA
LCF 130 06 050S		0.15	0.006	12.70	0.500	584.2	23	30.5	1.200	457.2	18	17.07	0.672	20.27	0.798	4.23	0.95	BA
LCF 130 08 050S		0.20	0.008	12.70	0.500	762.0	30	40.4	1.590	609.6	24	22.23	0.875	26.92	1.060	5.60	1.26	BG
LCF 130 10 063S		0.25	0.010	15.88	0.625	812.8	32	50.8	2.000	609.6	24	28.17	1.109	33.78	1.330	8.81	1.98	BM
LCF 130 12 075S		0.30	0.012	19.05	0.750	1016.0	40	60.5	2.380	762.0	30	34.14	1.344	40.39	1.590	12.63	2.84	BQ
LCF 130 12 100S		0.30	0.012	25.40	1.000	1016.0	40	60.5	2.380	762.0	30	34.14	1.344	40.39	1.590	16.86	3.79	BQ
LCF 130 15 100S		0.38	0.015	25.40	1.000	1066.8	42	75.7	2.980	762.0	30	42.47	1.672	50.55	1.990	21.08	4.74	BW
LCF 130 20 125S	0.51	0.020	31.75	1.250	1320.8	52	100.8	3.970	914.4	36	56.36	2.219	67.31	2.650	42.17	9.48	CE	
LCF 250 04 025S	25000	0.10	0.004	6.35	0.250	558.8	22	22.4	0.880	457.2	18	13.46	0.530	14.99	0.590	1.02	0.23	Z
LCF 250 05 038S		0.13	0.005	9.53	0.375	736.6	29	27.7	1.090	609.6	24	16.51	0.650	18.54	0.730	1.91	0.43	BA
LCF 250 06 038S		0.15	0.006	9.53	0.375	762.0	30	33.0	1.300	609.6	24	19.56	0.770	21.84	0.860	2.31	0.52	BA
LCF 250 06 050S		0.15	0.006	12.70	0.500	762.0	30	34.5	1.360	609.6	24	20.32	0.800	22.86	0.900	3.11	0.70	BB
LCF 250 08 050S		0.20	0.008	12.70	0.500	965.2	38	45.7	1.800	762.0	30	27.18	1.070	30.48	1.200	4.14	0.93	BG
LCF 250 10 063S		0.25	0.010	15.88	0.625	1016.0	40	57.9	2.280	762.0	30	34.54	1.360	38.61	1.520	6.49	1.46	BG
LCF 250 12 075S		0.30	0.012	19.05	0.750	1219.2	48	68.3	2.690	914.4	36	40.64	1.600	45.47	1.790	9.30	2.09	BM
LCF 250 12 100S		0.30	0.012	25.40	1.000	1219.2	48	68.3	2.690	914.4	36	40.64	1.600	45.47	1.790	12.46	2.80	BQ
LCF 250 15 100S		0.38	0.015	25.40	1.000	1422.4	56	83.8	3.300	1066.8	42	49.78	1.960	55.88	2.200	15.57	3.50	BW
LCF 250 20 125S		0.51	0.020	31.75	1.250	1524.0	60	108.0	4.250	1066.8	42	64.26	2.530	71.88	2.830	25.93	5.83	CE