

Constant Force Spring Series

Smooth Operation Under Stress

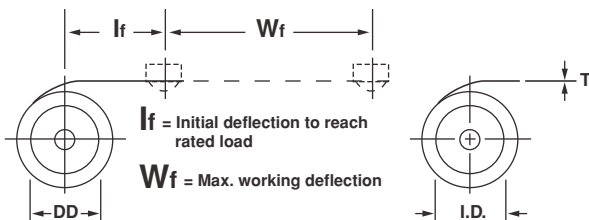


The Lee Spring Series of extension type Constant Force Spring's represent the most versatile type available. Ideal for use when smooth operating forces are required. Available in four Life Cycle ranges, 2500, 4000, 13000 and 25000. Each spring is made of a high yield Type 301 Stainless Steel strip exerting a nearly constant restraining force to resist uncoiling.

Constant Force springs offer the advantage of a smooth operation across the operating range. When the strip is extended (deflected) the inherent stress resists the loading force, the same as a common extension spring, but at a nearly constant (zero) rate. A constant torque is obtained when the outer end of the spring is attached to another spool and caused to wind in either the reverse or same direction as it is originally wound.

The full rated load of the spring is reached after being deflected to a length equal to 1.25 times its diameter. Thereafter, it maintains a relatively constant force regardless of extension length. Load is basically determined by the thickness and width of the material and the diameter of the coil.

Guide to Mounting Constant Force Springs:



Additional Information

- A Constant Force Spring is usually mounted by first tightly wrapping it on a drum, then attaching the free end to the loading force such as in a counterbalance application. This relationship can also be reversed.
- The drum diameter should be 10 to 20% larger than its natural inside diameter.
- One and one-half wraps should remain on the drum at maximum extension.
- The strip becomes unstable at long extensions and should be guided to prevent twisting or kinking on recoil.
- 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.



Lee Spring can manufacture custom constant force springs to your specifications. Contact us today!

Constant Force Spring Series

Guide to using tables

Lee Stock Number:
Lee Spring Part Number.

Thickness:
The thickness of the material used to make the spring.

Length:
The length of the spring material if fully unwound.

Working Deflection:
The maximum deflection beyond initial deflection which a spring can be loaded.

Drum Diameter:
The outside diameter of a drum or shaft over which a spring fits firmly.

2500 Life Cycles

LEE SPRING STOCK NUMBER	LIFE CYCLES	THICKNESS (T)		WIDTH (W)		LENGTH (L)		INITIAL DEFLECTION (If)		WORKING DEFLECTION (Wf)		INSIDE DIAMETER (ID)		DRUM DIAMETER (DD)		LOAD (P)	
		IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	LB	KG
LCF 025 04 025S	2500	0.004	0.10	0.250	6.35	14	356	0.52	13.21	12	305	0.297	7.54	0.349	8.86	0.660	0.30
LCF 025 05 031S	2500	0.005	0.13	0.313	7.94	15	381	0.65	16.51	12	305	0.359	9.12	0.436	11.07	1.030	0.47
LCF 025 06 038S	2500	0.006	0.15	0.375	9.53	21	533	0.78	19.81	18	457	0.438	11.13	0.523	13.28	1.480	0.67
LCF 025 06 050S	2500	0.006	0.15	0.500	12.70	21	533	0.78	19.81	18	457	0.438	11.13	0.523	13.28	1.970	0.89
LCF 025 08 050S	2500	0.008	0.20	0.500	12.70	28	711	1.06	26.92	24	610	0.578	14.68	0.697	17.70	2.630	1.19
LCF 025 10 063S	2500	0.010	0.25	0.625	15.88	29	737	1.31	33.27	24	610	0.700	17.78	0.812	22.00	4.100	1.86

Life Cycles:
The calculated fatigue life for the number of times a spring can be loaded and unloaded between two points.

Width:
The material width used to make the spring.

Initial Deflection:
The minimum deflection needed to extend an unloaded spring to its design load.

Inside Diameter:
The natural inside diameter of a spring before assembling with a drum.

Load:
The design constant force exerted by the spring in the working deflection range.

HOW TO DETERMINE LEE CONSTANT FORCE SPRING PRICING:

1. Select the spring you want by LEE STOCK NUMBER.
2. Refer to the PRICE TABLE below for quantities from 1-199 of any items.
3. Prices subject to change without notice.
4. For pricing or to place on-line orders of up to 599 pieces of an item, visit www.leespring.com. For pricing of 600 pieces and above, please submit a request through www.leespring.com or contact us by email, phone or fax.

5. **FREE GROUND SHIPPING AVAILABLE ON ORDERS OF \$40 OR MORE IN THE CONTINENTAL UNITED STATES.**



Stock Parts orders with a parts value below \$40.00 with delivery within the Continental United States will be charged freight, plus a \$20.00 handling charge. Stock Parts orders with delivery outside the Continental United States with a parts value more than \$40.00 will pay freight only and no handling charge.

Lee Stock Number	1 - 19	20 - 49	50 - 99	100 - 199
LCF 025 04 025S	4.49	3.46	3.27	3.09
LCF 025 05 031S	4.68	3.60	3.43	3.21
LCF 025 06 038S	4.89	3.76	3.59	3.38
LCF 025 06 050S	5.14	3.96	3.75	3.55
LCF 025 08 050S	5.83	4.49	4.26	4.01
LCF 025 10 063S	6.67	5.14	4.88	4.59
LCF 025 12 075S	7.12	5.48	5.21	4.90
LCF 025 12 100S	8.53	6.56	6.24	5.87
LCF 025 16 100S	11.92	9.16	8.71	8.18
LCF 025 20 125S	15.65	12.06	11.46	10.77
LCF 040 04 025S	4.71	3.63	3.45	3.24
LCF 040 05 031S	4.90	3.76	3.59	3.38
LCF 040 06 038S	5.14	3.96	3.75	3.55
LCF 040 06 050S	5.40	4.15	3.94	3.71
LCF 040 08 050S	6.12	4.71	4.48	4.20
LCF 040 10 063S	7.00	5.39	5.13	4.82
LCF 040 12 075S	7.47	5.76	5.47	5.15
LCF 040 12 100S	8.97	6.90	6.55	6.17
LCF 040 16 100S	12.50	9.63	9.14	8.61
LCF 040 20 125S	16.46	12.66	12.03	11.30

Lee Stock Number	1 - 19	20 - 49	50 - 99	100 - 199
LCF 130 04 025S	4.93	3.81	3.62	3.40
LCF 130 05 031S	5.15	3.96	3.75	3.55
LCF 130 06 038S	5.40	4.15	3.94	3.71
LCF 130 06 050S	5.65	4.37	4.14	3.89
LCF 130 08 050S	6.42	4.94	4.70	4.43
LCF 130 10 063S	7.35	5.65	5.38	5.04
LCF 130 12 075S	7.85	6.05	5.75	5.40
LCF 130 12 100S	9.41	7.25	6.88	6.47
LCF 130 15 100S	13.11	10.10	9.59	9.02
LCF 130 20 125S	17.27	13.29	12.62	11.87
LCF 250 04 025S	5.19	3.99	3.78	3.58
LCF 250 05 038S	5.40	4.15	3.94	3.71
LCF 250 06 038S	5.65	4.37	4.14	3.90
LCF 250 06 050S	5.96	4.58	4.36	4.09
LCF 250 08 050S	6.73	5.19	4.92	4.65
LCF 250 10 063S	7.72	5.94	5.63	5.32
LCF 250 12 075S	8.24	6.35	6.04	5.66
LCF 250 12 100S	9.88	7.61	7.22	6.79
LCF 250 15 100S	13.77	10.60	10.07	9.48
LCF 250 20 125S	18.12	13.96	13.26	12.45

CONSTANT FORCE SPRINGS

SPECIALTY STOCK PARTS: CONSTANT FORCE SPRINGS

Type 301 High Yield Stainless Steel

LEE SPRING STOCK NUMBER	LIFE CYCLES	THICKNESS (T)		WIDTH (W)		LENGTH (L)		INITIAL DEFLECTION (If)		WORKING DEFLECTION (Wf)		INSIDE DIAMETER (ID)		DRUM DIAMETER (DD)		LOAD (P)	
		IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	LB	KG

2500 Life Cycles

LCF 025 04 025S	2500	0.004	0.10	0.250	6.35	14	356	0.52	13.21	12	305	0.297	7.54	0.349	8.86	0.660	0.30
LCF 025 05 031S	2500	0.005	0.13	0.313	7.94	15	381	0.65	16.51	12	305	0.359	9.12	0.436	11.07	1.030	0.47
LCF 025 06 038S	2500	0.006	0.15	0.375	9.53	21	533	0.78	19.81	18	457	0.438	11.13	0.523	13.28	1.480	0.67
LCF 025 06 050S	2500	0.006	0.15	0.500	12.70	21	533	0.78	19.81	18	457	0.438	11.13	0.523	13.28	1.970	0.89
LCF 025 08 050S	2500	0.008	0.20	0.500	12.70	28	711	1.06	26.92	24	610	0.578	14.68	0.697	17.70	2.630	1.19
LCF 025 10 063S	2500	0.010	0.25	0.625	15.88	29	737	1.31	33.27	24	610	0.734	18.65	0.873	22.17	4.120	1.87
LCF 025 12 075S	2500	0.012	0.30	0.750	19.05	36	914	1.56	39.62	30	762	0.875	22.23	1.050	26.67	5.940	2.69
LCF 025 12 100S	2500	0.012	0.30	1.000	25.40	36	914	1.56	39.62	30	762	0.875	22.23	1.050	26.67	7.920	3.59
LCF 025 16 100S	2500	0.016	0.41	1.000	25.40	38	965	2.10	53.34	30	762	1.156	29.37	1.400	35.56	10.600	4.81
LCF 025 20 125S	2500	0.020	0.51	1.250	31.75	47	1194	2.60	66.04	36	914	1.469	37.31	1.750	44.45	16.500	7.48

4000 Life Cycles

LCF 040 04 025S	4000	0.004	0.10	0.250	6.35	15	381	0.61	15.49	12	305	0.340	8.64	0.400	10.16	0.500	0.23
LCF 040 05 031S	4000	0.005	0.13	0.313	7.94	17	432	0.75	19.05	12	305	0.370	9.40	0.500	12.70	1.030	0.47
LCF 040 06 038S	4000	0.006	0.15	0.375	9.53	24	610	0.94	23.88	18	457	0.450	11.43	0.620	15.75	1.480	0.67
LCF 040 06 050S	4000	0.006	0.15	0.500	12.70	25	635	0.97	24.64	18	457	0.450	11.43	0.650	16.51	1.970	0.89
LCF 040 08 050S	4000	0.008	0.20	0.500	12.70	30	762	1.24	31.50	24	610	0.590	14.99	0.820	20.83	2.630	1.19
LCF 040 10 063S	4000	0.010	0.25	0.625	15.88	33	838	1.49	37.85	24	610	0.730	18.54	0.990	25.15	4.120	1.87
LCF 040 12 075S	4000	0.012	0.30	0.750	19.05	39	991	1.79	45.47	30	762	0.880	22.35	1.190	30.23	5.940	2.69
LCF 040 12 100S	4000	0.012	0.30	1.000	25.40	39	991	1.80	45.72	30	762	0.880	22.35	1.200	30.48	7.920	3.59
LCF 040 16 100S	4000	0.016	0.41	1.000	25.40	40	1016	2.28	57.91	30	762	1.200	30.48	1.520	38.61	10.600	4.81
LCF 040 20 125S	4000	0.020	0.51	1.250	31.75	50	1270	2.83	71.88	36	914	1.470	37.34	1.890	48.01	16.500	7.48

13000 Life Cycles

LCF 130 04 025S	13000	0.004	0.10	0.250	6.35	15	381	0.80	20.32	12	305	0.438	11.13	0.533	13.54	0.320	0.15
LCF 130 05 031S	13000	0.005	0.13	0.313	7.94	16	406	1.00	25.40	12	305	0.563	14.30	0.665	16.89	0.490	0.22
LCF 130 06 038S	13000	0.006	0.15	0.375	9.53	23	584	1.20	30.48	18	457	0.672	17.07	0.798	20.27	0.710	0.32
LCF 130 06 050S	13000	0.006	0.15	0.500	12.70	23	584	1.20	30.48	18	457	0.672	17.07	0.798	20.27	0.950	0.43
LCF 130 08 050S	13000	0.008	0.20	0.500	12.70	30	762	1.59	40.39	24	610	0.875	22.23	1.060	26.92	1.260	0.57
LCF 130 10 063S	13000	0.010	0.25	0.625	15.88	32	813	2.00	50.80	24	610	1.109	28.18	1.330	33.78	1.980	0.90
LCF 130 12 075S	13000	0.012	0.30	0.750	19.05	40	1016	2.38	60.45	30	762	1.344	34.13	1.590	40.39	2.840	1.29
LCF 130 12 100S	13000	0.012	0.30	1.000	25.40	40	1016	2.38	60.45	30	762	1.344	34.13	1.590	40.39	3.790	1.72
LCF 130 15 100S	13000	0.015	0.38	1.000	25.40	42	1067	2.98	75.69	30	762	1.672	42.47	1.990	50.55	4.740	2.15
LCF 130 20 125S	13000	0.020	0.51	1.250	31.75	52	1321	3.97	100.84	36	914	2.219	56.36	2.650	67.31	9.480	4.30

25000 Life Cycles

LCF 250 04 025S	25000	0.004	0.10	0.250	6.35	22	559	0.88	22.35	18	457	0.530	13.46	0.590	14.99	0.230	0.10
LCF 250 05 038S	25000	0.005	0.13	0.375	9.53	29	737	1.09	27.69	24	610	0.650	16.51	0.730	18.54	0.430	0.20
LCF 250 06 038S	25000	0.006	0.15	0.375	9.53	30	762	1.30	33.02	24	610	0.770	19.56	0.860	21.84	0.520	0.24
LCF 250 06 050S	25000	0.006	0.15	0.500	12.70	30	762	1.36	34.54	24	610	0.800	20.32	0.900	22.86	0.700	0.32
LCF 250 08 050S	25000	0.008	0.20	0.500	12.70	38	965	1.80	45.72	30	762	1.070	27.18	1.200	30.48	0.930	0.42
LCF 250 10 063S	25000	0.010	0.25	0.625	15.88	40	1016	2.28	57.91	30	762	1.360	34.54	1.520	38.61	1.460	0.66
LCF 250 12 075S	25000	0.012	0.30	0.750	19.05	48	1219	2.69	68.33	36	914	1.600	40.64	1.790	45.47	2.090	0.95
LCF 250 12 100S	25000	0.012	0.30	1.000	25.40	48	1219	2.69	68.33	36	914	1.600	40.64	1.790	45.47	2.800	1.27
LCF 250 15 100S	25000	0.015	0.38	1.000	25.40	56	1422	3.30	83.82	42	1067	1.960	49.78	2.200	55.88	3.500	1.59
LCF 250 20 125S	25000	0.020	0.51	1.250	31.75	60	1524	4.25	107.95	42	1067	2.530	64.26	2.830	71.88	5.830	2.64

SPECIAL INSTRUCTIONS FOR CONSTANT FORCE SPRINGS

PRICING: See Page 316 for pricing up to 199 pcs. To price or order up to 599 pieces, visit www.leespring.com; 600+ pcs., contact Lee Spring.
CUSTOM DESIGNS: Custom Constant Force Springs are available on request; see Custom Springs Section for Constant Force Springs specification form.



CONSTANT FORCE SPRINGS