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 maximum length of a spring available for extension.

Inside Diameter
is the diameter of a spring in which a drum/shaft sits firmly.

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

LEE STOCK NUMBER	LIFE CYCLES	THICKNESS (T)		WIDTH (W)		LENGTH		INITAL DEFLECTION (If)		WORKING DEFLECTION (Wf)		INSIDE DIAMETER (ID)		DRUM DIAMETER (DD)		LOAD (P) ±10%		PRICE GROUP
		MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	N	LB	
LCF 025 04 025S	2,500	0.10	0.004	6.35	0.250	355.60	14.000	13.21	0.520	304.80	12.000	7.54	0.297	8.86	0.349	2.94	0.66	
LCF 025 05 031S		0.13	0.005	7.94	0.313	381.00	15.000	16.51	0.650	304.80	12.000	9.09	0.359	11.07	0.436	4.58	1.03	X
LCF 025 06 038S		0.15	0.006	9.53	0.375	533.40	21.000	19.81	0.780	457.20	18.000	11.13	0.438	13.28	0.523	6.53	1.48	X
LCF 025 06 050S		0.15	0.006	12.70	0.500	533.40	21.000	19.81	0.780	457.20	18.000	11.11	0.438	13.28	0.523	8.77	1.97	Y
LCF 025 08 050S		0.20	0.008	12.70	0.500	711.20	28.000	26.92	1.060	609.60	24.000	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	736.60	29.000	33.27	1.310	609.60	24.000	18.65	0.734	22.17	0.873	18.33	4.12	BG
LCF 025 12 075S		0.30	0.012	19.05	0.750	914.40	36.000	39.62	1.560	762.00	30.000	22.23	0.875	26.67	1.050	26.43	5.94	BG
LCF 025 12 100S		0.30	0.012	25.40	1.000	914.40	36.000	39.62	1.560	762.00	30.000	22.23	0.875	26.67	1.050	35.24	7.92	BG
LCF 025 15 100S		0.41	0.016	25.40	1.000	965.20	38.000	53.34	2.100	762.00	30.000	29.59	1.156	35.56	1.400	47.17	10.60	BW
LCF 025 20 125S		0.51	0.020	31.75	1.250	1,193.80	47.000	66.04	2.600	914.40	36.000	37.31	1.469	44.45	1.750	73.42	16.50	CD
LCF 040 04 025S	4,000	0.10	0.004	6.35	0.250	381.00	15.000	15.49	0.610	304.80	12.000	8.64	0.340	10.16	0.400	2.22	0.50	X
LCF 040 05 031S		0.13	0.005	7.94	0.313	431.80	17.000	19.05	0.750	304.80	12.000	9.40	0.370	12.70	0.500	4.58	1.03	X
LCF 040 06 038S		0.15	0.006	9.53	0.375	609.60	24.000	23.88	0.940	457.20	18.000	11.43	0.450	15.75	0.620	6.53	1.48	X
LCF 040 06 050S		0.15	0.006	12.70	0.500	635.00	25.000	24.64	0.970	457.20	18.000	11.43	0.450	16.51	0.650	8.77	1.97	Y
LCF 040 08 050S		0.20	0.008	12.70	0.500	762.00	30.000	31.50	1.240	609.60	24.000	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	838.20	33.000	37.85	1.490	609.60	24.000	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	990.60	39.000	45.47	1.790	762.00	30.000	22.35	0.880	30.23	1.190	26.43	5.94	BG
LCF 040 12 100S		0.30	0.012	25.40	1.000	990.60	39.000	45.72	1.800	762.00	30.000	22.35	0.880	30.48	1.200	35.24	7.92	BH
LCF 040 15 100S		0.41	0.016	25.40	1.000	1,016.00	40.000	57.91	2.280	762.00	30.000	30.48	1.200	38.61	1.520	47.17	10.60	BT
LCF 040 20 125S		0.51	0.020	31.75	1.250	1,270.00	50.000	71.88	2.830	914.40	36.000	37.34	1.470	48.01	1.890	73.42	16.50	BS
LCF 130 04 025S	13,000	0.10	0.004	6.35	0.250	381.00	15.000	20.32	0.800	304.80	12.000	11.13	0.438	13.54	0.533	1.42	0.32	X
LCF 130 05 031S		0.13	0.005	7.94	0.313	406.40	16.000	25.40	1.000	304.80	12.000	14.30	0.563	16.89	0.665	2.18	0.49	X
LCF 130 06 038S		0.15	0.006	9.53	0.375	584.20	23.000	30.48	1.200	457.20	18.000	17.07	0.672	20.27	0.798	3.16	0.71	Y
LCF 130 06 050S		0.15	0.006	12.70	0.500	584.20	23.000	30.48	1.200	457.20	18.000	17.07	0.672	20.27	0.798	4.23	0.95	Y
LCF 130 08 050S		0.20	0.008	12.70	0.500	762.00	30.000	40.39	1.590	609.60	24.000	22.23	0.875	26.92	1.060	5.61	1.26	BG
LCF 130 10 063S		0.25	0.010	15.88	0.625	812.80	32.000	50.80	2.000	609.60	24.000	28.18	1.109	33.78	1.330	8.81	1.98	BM
LCF 130 12 075S		0.30	0.012	19.05	0.750	1,016.00	40.000	60.45	2.380	762.00	30.000	34.13	1.344	40.39	1.590	12.64	2.84	BT
LCF 130 12 100S		0.30	0.012	25.40	1.000	1,016.00	40.000	60.45	2.380	762.00	30.000	34.13	1.344	40.39	1.590	16.86	3.79	BQ
LCF 130 15 100S		0.38	0.015	25.40	1.000	1,066.80	42.000	75.69	2.980	762.00	30.000	42.47	1.672	50.55	1.990	21.09	4.74	BW
LCF 130 20 125S		0.51	0.020	31.75	1.250	1,320.80	52.000	100.84	3.970	914.40	36.000	56.36	2.219	67.31	2.650	42.18	9.48	CE
LCF 250 04 025S	25,000	0.10	0.004	6.35	0.250	558.80	22.000	22.35	0.880	457.20	18.000	13.46	0.530	14.99	0.590	1.02	0.23	Y
LCF 250 05 038S		0.13	0.005	7.94	0.375	736.60	29.000	27.69	1.090	609.60	24.000	16.51	0.650	18.54	0.730	1.91	0.43	Y
LCF 250 06 038S		0.15	0.006	9.53	0.375	762.00	30.000	33.02	1.300	609.60	24.000	19.56	0.770	21.84	0.860	2.31	0.52	Y
LCF 250 06 050S		0.15	0.006	12.70	0.500	762.00	30.000	34.54	1.360	609.60	24.000	20.32	0.800	22.86	0.900	3.11	0.70	Y
LCF 250 08 050S		0.20	0.008	12.70	0.500	965.20	38.000	45.72	1.800	762.00	30.000	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	1,016.00	40.000	57.91	2.280	762.00	30.000	34.54	1.360	38.61	1.520	6.50	1.46	BG
LCF 250 12 075S		0.30	0.012	19.05	0.750	1,219.20	48.000	68.33	2.690	914.40	36.000	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	1,219.20	48.000	68.33	2.690	914.40	36.000	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	1,422.40	56.000	83.82	3.300	1,066.80	42.000	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	1,524.00	60.000	107.95	4.250	1,066.80	42.000	64.26	2.530	71.88	2.830	25.94	5.83	CE

ADDITIONAL INFORMATION

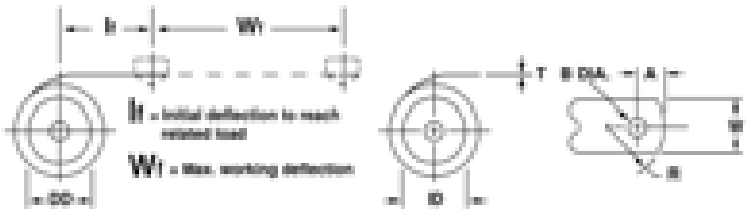
Manufactured from high yield 301 stainless steel strip our constant force springs exert a near constant restraining force to resist uncoiling. This natural inbuilt stress resists load at an even rate and so makes the springs suitable for use in retractor mechanisms. Common applications include counterbalance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



CONSTANT FORCE SPRINGS

LEE STOCK NUMBER	LIFE CYCLES	THICKNESS (T)		WIDTH (W)		LENGTH		INITAL 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	2,500	0.10	0.004	6.35	0.250	355.60	14.000	13.21	0.520	304.80	12.000	7.54	0.297	8.86	0.349	2.94	0.66	X
LCF 025 05 031S		0.13	0.005	7.94	0.313	381.00	15.000	16.51	0.650	304.80	12.000	9.12	0.359	11.07	0.436	4.58	1.03	X
LCF 025 06 038S		0.15	0.006	9.53	0.375	533.40	21.000	19.81	0.780	457.20	18.000	11.13	0.438	13.28	0.523	6.59	1.48	X
LCF 025 06 050S		0.15	0.006	12.70	0.500	533.40	21.000	19.81	0.780	457.20	18.000	11.11	0.438	13.28	0.523	8.77	1.97	Y
LCF 025 08 050S		0.20	0.008	12.70	0.500	711.20	28.000	26.92	1.060	609.60	24.000	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	736.60	29.000	33.27	1.310	609.60	24.000	18.65	0.734	22.17	0.873	18.33	4.12	BG
LCF 025 12 075S		0.30	0.012	19.05	0.750	914.40	36.000	39.62	1.560	762.00	30.000	22.23	0.875	26.67	1.050	26.43	5.94	BG
LCF 025 12 100S		0.30	0.012	25.40	1.000	914.40	36.000	39.62	1.560	762.00	30.000	22.23	0.875	26.67	1.050	35.24	7.92	BG
LCF 025 16 100S		0.41	0.016	25.40	1.000	965.20	38.000	53.34	2.100	762.00	30.000	29.37	1.156	35.56	1.400	47.17	10.60	BW
LCF 025 20 125S		0.51	0.020	31.75	1.250	1,193.80	47.000	66.04	2.600	914.40	36.000	37.31	1.469	44.45	1.750	73.42	16.50	CD
LCF 040 04 025S	4,000	0.10	0.004	6.35	0.250	381.00	15.000	15.49	0.610	304.80	12.000	8.64	0.340	10.16	0.400	2.22	0.50	X
LCF 040 05 031S		0.13	0.005	7.94	0.313	431.80	17.000	19.05	0.750	304.80	12.000	9.40	0.370	12.70	0.500	4.58	1.03	X
LCF 040 06 038S		0.15	0.006	9.53	0.375	609.60	24.000	23.88	0.940	457.20	18.000	11.43	0.450	15.75	0.620	6.59	1.48	X
LCF 040 06 050S		0.15	0.006	12.70	0.500	635.00	25.000	24.64	0.970	457.20	18.000	11.43	0.450	16.51	0.650	8.77	1.97	Y
LCF 040 08 050S		0.20	0.008	12.70	0.500	762.00	30.000	31.50	1.240	609.60	24.000	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	838.20	33.000	37.85	1.490	609.60	24.000	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	990.60	39.000	45.47	1.790	762.00	30.000	22.35	0.880	30.23	1.190	26.43	5.94	BG
LCF 040 12 100S		0.30	0.012	25.40	1.000	990.60	39.000	45.72	1.800	762.00	30.000	22.35	0.880	30.48	1.200	35.24	7.92	BH
LCF 040 16 100S		0.41	0.016	25.40	1.000	1,016.00	40.000	57.91	2.280	762.00	30.000	30.48	1.200	38.61	1.520	47.17	10.60	BM
LCF 040 20 125S		0.51	0.020	31.75	1.250	1,270.00	50.000	71.88	2.830	914.40	36.000	37.34	1.470	48.01	1.890	73.42	16.50	BS
LCF 130 04 025S	13,000	0.10	0.004	6.35	0.250	381.00	15.000	20.32	0.800	304.80	12.000	11.13	0.438	13.54	0.533	1.42	0.32	X
LCF 130 05 031S		0.13	0.005	7.94	0.313	406.40	16.000	25.40	1.000	304.80	12.000	14.30	0.563	16.89	0.665	2.18	0.49	X
LCF 130 06 038S		0.15	0.006	9.53	0.375	584.20	23.000	30.48	1.200	457.20	18.000	17.07	0.672	20.27	0.798	3.16	0.71	Y
LCF 130 06 050S		0.15	0.006	12.70	0.500	584.20	23.000	30.48	1.200	457.20	18.000	17.07	0.672	20.27	0.798	4.23	0.95	Y
LCF 130 08 050S		0.20	0.008	12.70	0.500	762.00	30.000	40.39	1.590	609.60	24.000	22.23	0.875	26.92	1.060	5.61	1.26	BG
LCF 130 10 063S		0.25	0.010	15.88	0.625	812.80	32.000	50.80	2.000	609.60	24.000	28.18	1.109	33.78	1.330	8.81	1.98	BM
LCF 130 12 075S		0.30	0.012	19.05	0.750	1,016.00	40.000	60.45	2.380	762.00	30.000	34.13	1.344	40.39	1.590	12.64	2.84	BQ
LCF 130 12 100S		0.30	0.012	25.40	1.000	1,016.00	40.000	60.45	2.380	762.00	30.000	34.13	1.344	40.39	1.590	16.86	3.79	BQ
LCF 130 15 100S		0.38	0.015	25.40	1.000	1,066.80	42.000	75.69	2.980	762.00	30.000	42.47	1.672	50.55	1.990	21.09	4.74	BW
LCF 130 20 125S		0.51	0.020	31.75	1.250	1,320.80	52.000	100.84	3.970	914.40	36.000	56.36	2.219	67.31	2.650	42.18	9.48	CE
LCF 250 04 025S	25,000	0.10	0.004	6.35	0.250	558.80	22.000	22.35	0.880	457.20	18.000	13.46	0.530	14.99	0.590	1.02	0.23	Y
LCF 250 05 038S		0.13	0.005	7.94	0.375	736.60	29.000	27.69	1.090	609.60	24.000	16.51	0.650	18.54	0.730	1.91	0.43	Y
LCF 250 06 038S		0.15	0.006	9.53	0.375	762.00	30.000	33.02	1.300	609.60	24.000	19.56	0.770	21.84	0.860	2.31	0.52	Y
LCF 250 06 050S		0.15	0.006	12.70	0.500	762.00	30.000	34.54	1.360	609.60	24.000	20.32	0.800	22.86	0.900	3.11	0.70	Y
LCF 250 08 050S		0.20	0.008	12.70	0.500	965.20	38.000	45.72	1.800	762.00	30.000	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	1,016.00	40.000	57.91	2.280	762.00	30.000	34.54	1.360	38.61	1.520	6.50	1.46	BG
LCF 250 12 075S		0.30	0.012	19.05	0.750	1,219.20	48.000	68.33	2.690	914.40	36.000	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	1,219.20	48.000	68.33	2.690	914.40	36.000	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	1,422.40	56.000	83.82	3.300	1,066.80	42.000	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	1,524.00	60.000	107.95	4.250	1,066.80	42.000	64.26	2.530	71.88	2.830	25.94	5.83	CE