

CONSTANT FORCE SPRINGS

Stock sizes in stainless steel

Constant-force springs are a special variety of extension spring. They consist of a spiral of strip material with built-in curvature so that each turn of the strip wraps tightly on its inner neighbor. When the strip is extended (deflected) the inherent stress resists the loading force, just as in a common extension spring, but at a nearly constant (zero) rate.

The constant-force spring is well suited to long extensions with no load build-up. In use, the spring is usually mounted with the ID tightly wrapped on a drum and the free end attached to the loading force, such as in a counterbalance application. This relationship can be reversed, however, with the free end mounted stationary and the spring itself providing the working force, as with carbon brushes in electrical apparatus.

Material

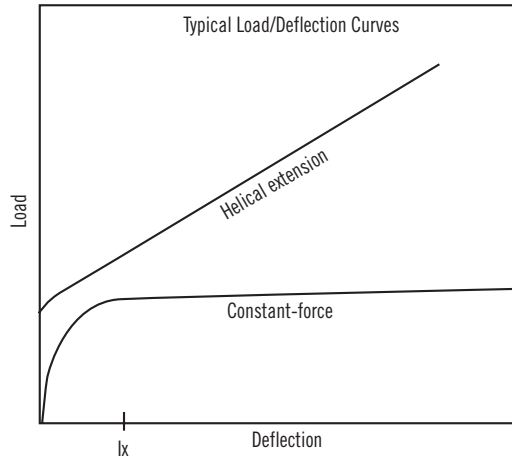
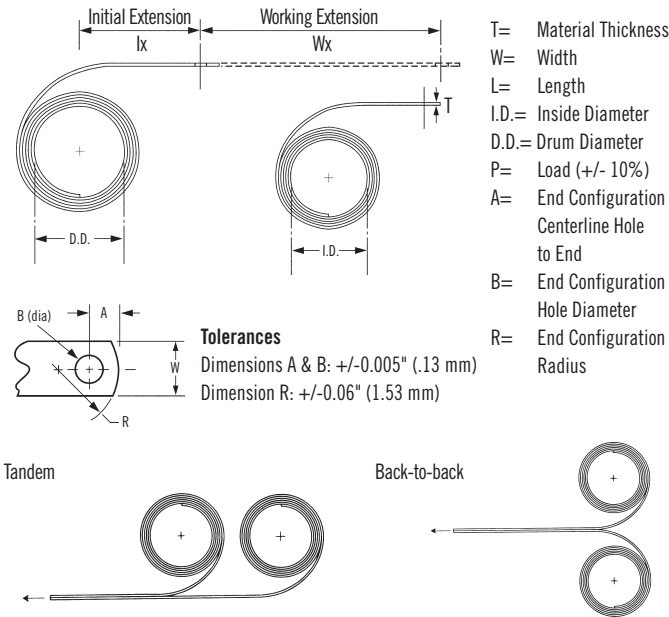
Type 301 Stainless Steel

Note

Be sure to allow at least 1 1/2 coils of material on the drum at full extension. The spring ID will wrap tightly on the drum so that in most applications no fastening method on the drum is required.

How to Multiply Constant Force Spring Load

Considerable flexibility is possible with constant-force springs because the load capacity can be multiplied by using two or more strips in tandem or back-to-back, as illustrated.



Initial Extension (minimum amount of extension needed to operate the spring and achieve a constant rate)

CONSTANT FORCE SPRINGS - STAINLESS STEEL																							
Catalog Number	Thickness (T) (Reference)		Width (W) (Reference)		Length (L) (Reference)		Initial Extension (lx) (Reference)		Working Extension (Wx) Max		Inside Diameter (I.D.) Reference		Drum Diameter (Reference)		Load (P) +/- 10%		End Configuration						Fatigue Life Cycles
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lb	N	A		B		R		
CF015-0050	0.004	0.10	0.25	6.35	15	381	0.61	15.49	12	305	0.34	8.64	0.40	10.16	0.50	2.22	3/8	9.5	0.131	3.3	1/2	12.7	4000
CF018-0075	0.005	0.13	0.31	7.87	18	457	0.75	19.05	15	381	0.42	10.67	0.50	12.70	0.75	3.34	3/8	9.5	0.131	3.3	1/2	12.7	4000
CF022-0112	0.006	0.15	0.37	9.40	22	559	0.92	23.37	18	457	0.51	12.95	0.62	15.75	1.12	4.98	3/8	9.5	0.131	3.3	1/2	12.7	4000
CF026-0162	0.007	0.18	0.50	12.70	26	660	1.06	26.92	21	533	0.59	14.99	0.75	19.05	1.62	7.21	3/8	9.5	0.131	3.3	1/2	12.7	4000
CF030-0237	0.008	0.20	0.59	14.99	30	762	1.22	30.99	24	610	0.68	17.27	0.87	22.10	2.37	10.54	3/8	9.5	0.187	4.7	3/4	19.1	4000
CF034-0350	0.010	0.25	0.68	17.27	34	864	1.53	38.86	27	686	0.85	21.59	1.00	25.40	3.50	15.57	3/8	9.5	0.187	4.7	3/4	19.1	4000
CF038-0500	0.012	0.30	0.81	20.57	38	965	1.84	46.74	30	762	1.02	25.91	1.25	31.75	5.00	22.24	3/8	9.5	0.187	4.7	3/4	19.1	4000
CF043-0700	0.014	0.36	1.00	25.40	43	1092	2.14	54.36	33	838	1.19	30.23	1.50	38.10	7.00	31.14	3/8	9.5	0.187	4.7	3/4	19.1	4000
CF018-0023	0.004	0.10	0.25	6.35	18	457	0.62	16.00	15	381	0.53	13.45	0.59	14.98	0.23	1.02	3/8	9.5	0.13	3.3	1/2	12.7	25000
CF018-0043	0.005	0.13	0.38	9.52	25	635	0.78	20.00	22	558	0.65	16.50	0.73	18.53	0.43	1.91	3/8	9.5	0.13	3.3	1/2	12.7	25000
CF025-0052	0.006	0.15	0.38	9.52	25	635	0.90	23.00	21	533	0.77	19.55	0.86	21.83	0.52	2.31	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF025-0070	0.006	0.15	0.50	12.69	25	635	0.92	23.00	21	533	0.80	20.31	0.90	22.85	0.70	3.11	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF033-0093	0.008	0.20	0.50	12.69	33	838	1.23	31.00	28	711	1.07	27.16	1.20	30.46	0.93	4.14	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF035-0146	0.010	0.25	0.63	15.87	35	888	1.53	39.00	29	736	1.36	34.52	1.52	38.58	1.46	6.49	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF045-0209	0.012	0.30	0.75	19.04	45	1142	1.82	46.00	38	965	1.60	40.62	1.79	45.44	2.09	9.29	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF045-0280	0.012	0.30	1.00	25.38	45	1142	1.84	47.00	38	965	1.60	40.62	1.79	45.44	2.80	12.45	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF048-0350	0.015	0.38	1.00	25.38	48	1218	2.20	56.00	39	990	1.96	49.75	2.20	55.85	3.50	15.56	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF046-0410	0.016	0.41	1.00	25.38	46	1168	2.21	56.00	37	939	1.96	49.75	2.20	55.85	4.10	18.23	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF-048-0437	0.015	0.38	1.25	31.73	48	1218	2.29	58.00	39	990	2.03	51.53	2.27	57.62	4.37	19.43	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF055-0583	0.020	0.51	1.25	31.73	55	1396	2.82	72.00	43	1092	2.53	64.22	2.83	71.84	5.83	25.92	3/8	9.5	0.20	4.9	1/2	12.7	25000
CF021-0025	0.006	0.15	0.37	9.40	21	533	2.03	51.56	12	305	1.13	28.70	1.36	34.54	0.25	1.11	3/8	9.5	0.131	3.3	1/2	12.7	40000
CF025-0037	0.007	0.18	0.50	12.70	25	635	2.36	59.94	15	381	1.31	33.27	1.58	40.13	0.37	1.65	3/8	9.5	0.131	3.3	1/2	12.7	40000
CF030-0050	0.008	0.20	0.59	14.99	30	762	2.72	69.09	18	457	1.51	38.35	1.81	45.97	0.50	2.22	3/8	9.5	0.187	4.7	3/4	19.1	40000
CF036-0075	0.010	0.25	0.68	17.27	36	914	3.38	85.85	21	533	1.88	47.75	2.26	57.40	0.75	3.34	3/8	9.5	0.187	4.7	3/4	19.1	40000
CF042-0112	0.012	0.30	0.81	20.57	42	1067	4.07	103.40	24	610	2.26	57.40	2.71	68.83	1.12	4.98	3/8	9.5	0.187	4.7	3/4	19.1	40000
CF048-0162	0.014	0.36	1.00	25.40	48	1219	4.74	120.40	27	686	2.63	66.80	3.16	80.26	1.62	7.21	3/8	9.5	0.187	4.7	3/4	19.1	40000

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