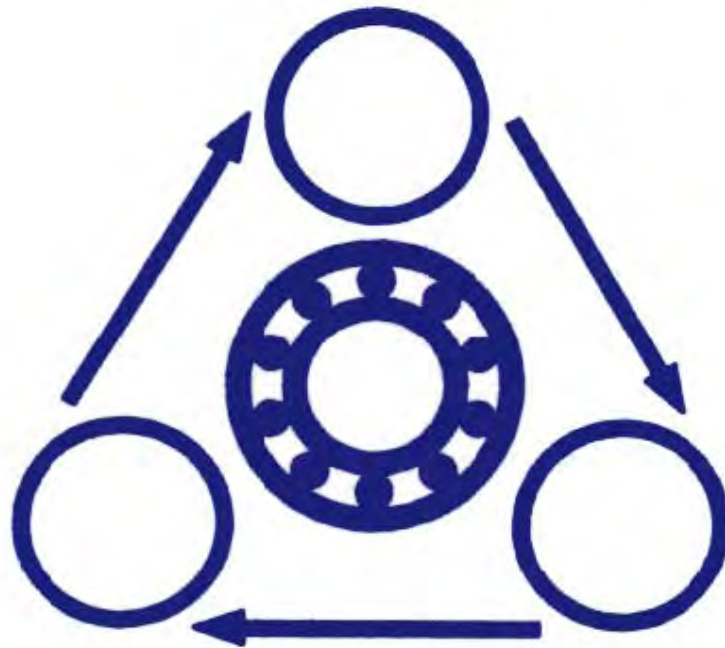


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DISC SPRINGS CATALOGUE



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Disc Spring Contents

Disc Springs to DIN 2039..... L4

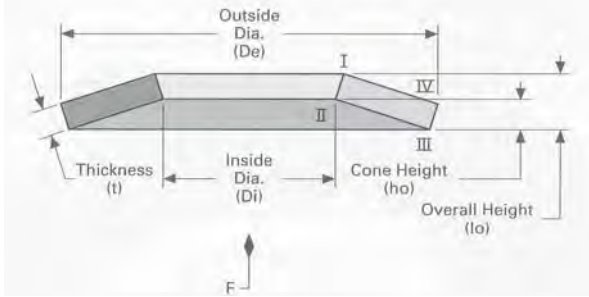
Disc Springs: Stacking Examples..... L14

Stainless Steel Disc Springs Available On Request.

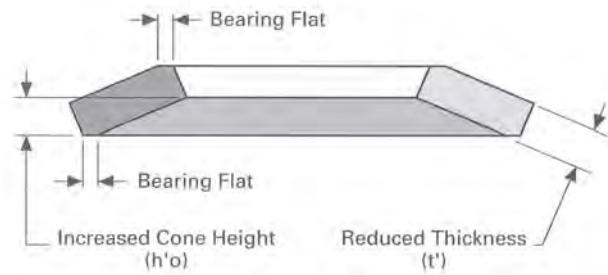
Please note: At Ashley Power we take care to ensure that all information is correct at time of printing however some errors and omissions excepted.



Disc Spring without Bearing Flats



Disc Spring with Bearing Flats

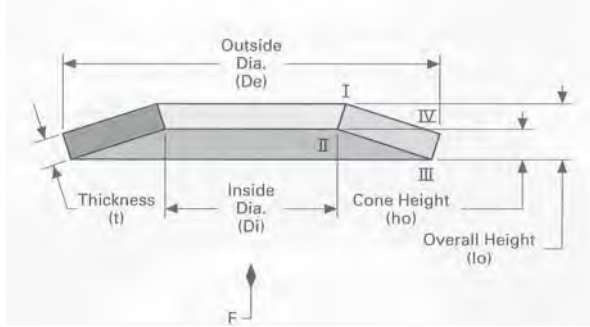


Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection			
									Defl. mm		Defl. mm		Defl. mm		Defl. mm		Defl. mm		Defl. mm		Defl. mm	
									Force N	Stress N/mm2	Force N	Stress N/mm2	Force N	Stress N/mm2	Force N	Stress N/mm2	Force N	Stress N/mm2	Force N	Stress N/mm2	Force N	Stress N/mm2
DS3.2X6X0.3	3.20	6.00	0.30		0.15	0.45	0.50	0.05	0.02	27	0.05	53	0.07	76	0.09	98	0.11	119	0.14	140		
									198	273	420	531	664	774	930	1002	1220	1215	1532	1414		
DS3.2X8X0.2	3.20	8.00	0.20		0.20	0.40	1.00	0.07	0.03	8	0.06	14	0.09	19	0.12	23	0.15	26	0.18	28		
									37	144	97	276	179	396	283	504	409	600	558	684		
DS3.2X8X0.3	3.20	8.00	0.30		0.25	0.55	0.83	0.10	0.04	29	0.08	53	0.11	73	0.15	90	0.19	104	0.23	117		
									113	247	261	475	443	684	660	875	912	1046	1198	1199		
DS3.2X8X0.4	3.20	8.00	0.40		0.20	0.60	0.50	0.13	0.03	43	0.06	82	0.09	119	0.12	153	0.15	186	0.18	217		
									212	214	446	416	702	605	981	783	1281	949	1604	1102		
DS3.2X8X0.5	3.20	8.00	0.50		0.20	0.70	0.40	0.17	0.03	79	0.06	153	0.09	223	0.12	291	0.15	357	0.18	422		
									299	249	620	485	964	710	1329	922	1717	1123	2128	1311		
DS4.2X8X0.2	4.20	8.00	0.20		0.25	0.45	1.25	0.06	0.04	14	0.08	24	0.11	32	0.15	36	0.19	39	0.23	41		
									-7	253	21	483	85	690	185	873	319	1034	489	1172		
DS4.2X8X0.3	4.20	8.00	0.30		0.25	0.55	0.83	0.09	0.04	33	0.08	60	0.11	83	0.15	102	0.19	118	0.23	133		
									99	308	233	594	402	856	607	1095	847	1312	1123	1505		
DS4.2X8X0.4	4.20	8.00	0.40		0.20	0.60	0.50	0.11	0.03	48	0.06	93	0.09	134	0.12	173	0.15	210	0.18	245		
									198	268	419	522	663	761	929	985	1218	1194	1530	1389		
DS3.2X10X0.3	3.20	10.00	0.30		0.35	0.65	1.17	0.17	0.05	34	0.11	59	0.16	77	0.21	90	0.26	98	0.32	105		
									39	234	124	447	254	638	430	808	652	957	919	1085		
DS3.2X10X0.4	3.20	10.00	0.40		0.30	0.70	0.75	0.22	0.05	48	0.09	88	0.14	123	0.18	153	0.23	179	0.27	204		
									160	214	353	412	579	595	840	762	1134	913	1461	1048		
DS3.2X10X0.5	3.20	10.00	0.50		0.25	0.75	0.50	0.28	0.04	64	0.08	123	0.11	178	0.15	229	0.19	279	0.23	326		
									238	189	500	368	784	535	1092	692	1424	838	1779	972		
DS4.2X10X0.4	4.20	10.00	0.40		0.30	0.70	0.75	0.20	0.05	50	0.09	93	0.14	129	0.18	161	0.23	189	0.27	215		
									134	249	300	480	497	693	727	888	988	1066	1282	1225		
DS4.2X10X0.5	4.20	10.00	0.50		0.25	0.75	0.50	0.25	0.04	68	0.08	130	0.11	188	0.15	242	0.19	294	0.23	344		
									208	221	438	430	690	626	964	810	1260	981	1578	1140		
DS4.2X10X0.6	4.20	10.00	0.60		0.25	0.85	0.42	0.30	0.04	111	0.08	216	0.11	315	0.15	410	0.19	502	0.23	592		
									277	250	575	487	896	712	1239	925	1604	1125	1991	1313		
DS5.2X10X0.25	5.20	10.00	0.25		0.30	0.55	1.20	0.11	0.05	20	0.09	35	0.14	45	0.18	53	0.23	58	0.27	61		
									2	235	37	449	104	642	203	814	336	965	500	1095		
DS5.2X10X0.4	5.20	10.00	0.40		0.30	0.70	0.75	0.18	0.05	56	0.09	103	0.14	143	0.18	178	0.23	209	0.27	238		
									124	298	280	575	468	832	690	1067	943	1281	1230	1474		
DS5.2X10X0.5	5.20	10.00	0.50		0.25	0.75	0.50	0.22	0.04	75	0.08	144	0.11	208	0.15	268	0.19	325	0.23	381		
									198	266	419	517	663	753	929	975	1218	1182	1529	1375		
DS4.2X12X0.4	4.20	12.00	0.40		0.40	0.80	1.00	0.31	0.06	55	0.12	98	0.18	132	0.24	158	0.3	178	0.36	195		
									76	238	193	455	350	653	548	830	786	988	1064	1125		
DS4.2X12X0.5	4.20	12.00	0.50		0.35	0.85	0.70	0.39	0.05	73	0.11	136	0.16	191	0.21	240	0.26	284	0.32	325		
									165	219	361	423	589	612	847	785	1136	943	1456	1086		
DS4.2X12X0.6	4.20	12.00	0.60		0.40	1.00	0.67	0.47	0.06	141	0.12	263	0.18	372	0.24	468	0.3	557	0.36	640		
									239	295	519	569	839	824	1199	1058	1600	1273	2041	1467		
DS5.2X12X0.5	5.20	12.00	0.50		0.40	0.90	0.80	0.36	0.06	96	0.12	176	0.18	243	0.24	300	0.3	350	0.36	395		
									137	303	314	584	530	842	785	1078	1080	1291	1414	1482		
DS5.2X12X0.6	5.20	12.00	0.60		0.35	0.95	0.58	0.43	0.05	122	0.11	231	0.16	330	0.21	421	0.26	506	0.32	588		
									213	279	456	540	730	785	1033	1012	1367	1222	1730	1415		
DS6.2X12X0.5	6.20	12.00	0.50		0.35	0.85	0.70	0.33	0.05	84	0.11	157	0.16	220	0.21	276	0.26	326	0.32	374		
									139	291	308	563	509	815	740	1047	1001	1259	1294	1452		
DS6.2X12X0.6	6.20	12.00	0.60		0.35	0.95	0.58	0.39	0.05	133	0.11	252	0.16	360	0.21	459	0.26	552	0.32	640		
									204	325	440	631	706	916	1002	1182	1329	1429	1687	1655		
DS5.2X12.5X0.5	5.20	12.50	0.50		0.35	0.85	0.70	0.40	0.05	70	0.11	131	0.16	183	0.21	230	0.26	272	0.32	312		
									138	224	304	432	497	625	718	803	967	965	1244	1112		
DS6.2X12.5X0.35	6.20	12.50	0.35		0.45	0.80	1.29	0.25	0.07	55	0.14	95	0.2	123	0.27	141	0.34	151	0.41	157		
									-14	314	18	598	97	854	222	1080	393	1278	611	1446		

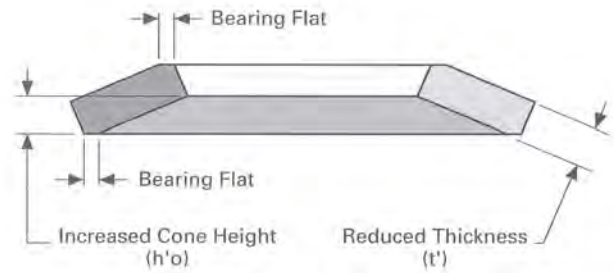
Disc Springs to DIN 2093



Disc Spring without Bearing Flats



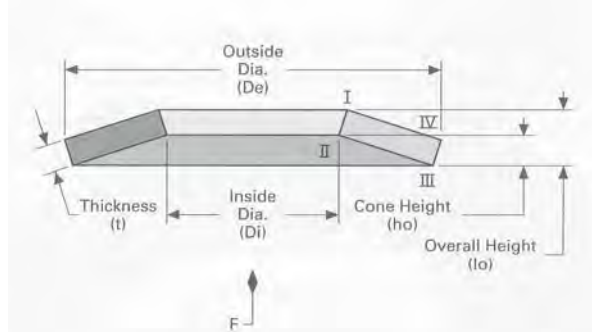
Disc Spring with Bearing Flats



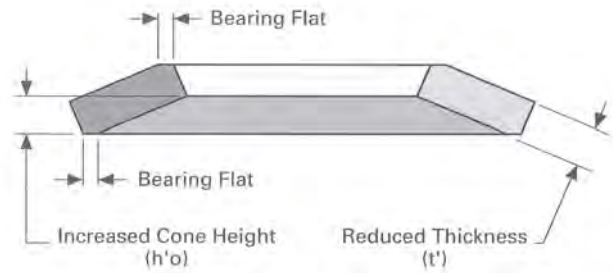
Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection	
									Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N
									Stress		Stress		Stress		Stress		Stress		Stress	
									δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}
									N/mm ²	N/mm ²	N/mm ²	N/mm ²	N/mm ²	N/mm ²	N/mm ²	N/mm ²	N/mm ²	N/mm ²	N/mm ²	N/mm ²
DS6.2X12.5X0.5	6.20	12.50	0.50		0.35	0.85	0.70	0.36	0.05	76	0.11	141	0.16	198	0.21	248	0.26	293	0.32	336
									129	258	286	498	471	721	684	926	925	1114	1194	1284
DS6.2X12.5X0.6	6.20	12.50	0.60		0.35	0.95	0.58	0.44	0.05	119	0.11	227	0.16	324	0.21	413	0.26	496	0.32	576
									189	288	407	558	652	811	926	1046	1227	1264	1557	1464
DS6.2X12.5X0.7	6.20	12.50	0.70		0.30	1.00	0.43	0.51	0.05	147	0.09	284	0.14	415	0.18	539	0.23	660	0.27	777
									235	259	491	505	767	739	1064	959	1382	1167	1720	1361
DS6.2X12.5X1	6.20	12.50	1.00		0.20	1.20	0.20	0.73	0.03	257	0.06	510	0.09	760	0.12	1008	0.15	1254	0.18	1499
									289	206	586	407	893	602	1209	791	1534	975	1868	1152
DS7.2X14X0.35	7.20	14.00	0.35		0.45	0.80	1.29	0.31	0.07	45	0.14	78	0.2	100	0.27	115	0.34	123	0.41	128
									-13	259	12	494	74	705	173	892	309	1055	482	1195
DS7.2X14X0.5	7.20	14.00	0.50		0.40	0.90	0.80	0.44	0.06	76	0.12	140	0.18	194	0.24	239	0.3	279	0.36	315
									94	258	217	497	370	717	553	919	764	1101	1005	1265
DS7.2X14X0.8	7.20	14.00	0.80		0.30	1.10	0.38	0.71	0.05	173	0.09	338	0.14	496	0.18	648	0.23	797	0.27	943
									228	235	473	460	735	674	1013	878	1308	1071	1619	1253
DS5.2X15X0.4	5.20	15.00	0.40		0.55	0.95	1.38	0.49	0.08	67	0.17	115	0.25	147	0.33	166	0.41	176	0.5	180
									-15	249	19	473	103	674	235	850	417	1002	647	1130
DS5.2X15X0.5	5.20	15.00	0.50		0.50	1.00	1.00	0.61	0.08	86	0.15	154	0.23	206	0.3	246	0.38	278	0.45	305
									77	236	195	453	353	650	551	826	790	983	1070	1119
DS5.2X15X0.6	5.20	15.00	0.60		0.45	1.05	0.75	0.73	0.07	108	0.14	200	0.2	278	0.27	347	0.34	407	0.41	463
									151	222	334	428	551	618	800	792	1082	949	1397	1090
DS5.2X15X0.7	5.20	15.00	0.70		0.40	1.10	0.57	0.85	0.06	133	0.12	252	0.18	361	0.24	461	0.3	555	0.36	645
									206	206	439	399	697	579	981	746	1291	901	1627	1043
DS6.2X15X0.5	6.20	15.00	0.50		0.50	1.00	1.00	0.58	0.08	89	0.15	160	0.23	214	0.3	256	0.38	289	0.45	317
									64	262	168	501	311	719	494	915	716	1089	977	1242
DS6.2X15X0.6	6.20	15.00	0.60		0.45	1.05	0.75	0.69	0.07	112	0.14	208	0.2	290	0.27	360	0.34	424	0.41	482
									135	246	302	475	501	685	732	878	994	1054	1289	1212
DS6.2X15X0.7	6.20	15.00	0.70		0.40	1.10	0.57	0.81	0.06	138	0.12	262	0.18	376	0.24	480	0.3	578	0.36	671
									189	228	402	443	642	643	906	829	1195	1002	1510	1160
DS8.2X15X0.5	8.20	15.00	0.50		0.50	1.00	1.00	0.49	0.08	103	0.15	184	0.23	247	0.3	295	0.38	334	0.45	365
									51	334	142	640	275	919	448	1171	662	1396	917	1593
DS8.2X15X0.7	8.20	15.00	0.70		0.40	1.10	0.57	0.68	0.06	159	0.12	303	0.18	433	0.24	553	0.3	666	0.36	774
									178	293	382	569	612	827	868	1067	1150	1291	1459	1496
DS8.2X15X0.8	8.20	15.00	0.80		0.40	1.20	0.50	0.78	0.06	226	0.12	434	0.18	628	0.24	809	0.3	982	0.36	1150
									226	320	478	622	757	906	1061	1173	1392	1423	1749	1655
DS8.2X16X0.4	8.20	16.00	0.40		0.50	0.90	1.25	0.47	0.08	55	0.15	96	0.23	124	0.3	143	0.38	154	0.45	162
									-6	247	23	471	88	673	187	852	322	1009	491	1143
DS8.2X16X0.6	8.20	16.00	0.60		0.45	1.05	0.75	0.70	0.07	109	0.14	201	0.2	280	0.27	349	0.34	410	0.41	466
									109	258	246	498	412	720	607	924	830	1109	1081	1276
DS8.2X16X0.7	8.20	16.00	0.70		0.45	1.15	0.64	0.81	0.07	159	0.14	298	0.2	422	0.27	534	0.34	637	0.41	735
									156	283	341	547	555	793	796	1021	1067	1230	1366	1422
DS8.2X16X0.8	8.20	16.00	0.80		0.40	1.20	0.50	0.93	0.06	190	0.12	365	0.18	527	0.24	680	0.3	825	0.36	966
									199	262	420	509	663	742	929	960	1218	1164	1529	1354
DS8.2X16X0.9	8.20	16.00	0.90		0.35	1.25	0.39	1.05	0.05	221	0.11	431	0.16	632	0.21	825	0.26	1013	0.32	1197
									226	238	469	465	729	681	1006	886	1301	1080	1613	1263
DS6.2X18X0.4	6.20	18.00	0.40		0.60	1.00	1.50	0.70	0.09	57	0.18	96	0.27	121	0.36	134	0.45	139	0.54	138
									-32	198	-23	376	26	534	116	673	247	791	418	890
DSX6.2X18X0.5	6.20	18.00	0.50		0.60	1.10	1.20	0.88	0.09	85	0.18	149	0.27	194	0.36	225	0.45	245	0.54	259
									23	217	86	414	190	591	335	748	520	885	746	1003
DS6.2X18X0.6	6.20	18.00	0.60		0.60	1.20	1.00	1.06	0.09	124	0.18	221	0.27	296	0.36	355	0.45	400	0.54	438
									78	236	196	452	354	647	554	823	794	980	1074	1116
DS6.2X18X0.7	6.20	18.00	0.70		0.55	1.25	0.79	1.23	0.08	150	0.17	276	0.25	382	0.33	473	0.41	553	0.5	625
									140	224	315	431	523	622	766	795	1043	953	1354	1093



Disc Spring without Bearing Flats



Disc Spring with Bearing Flats

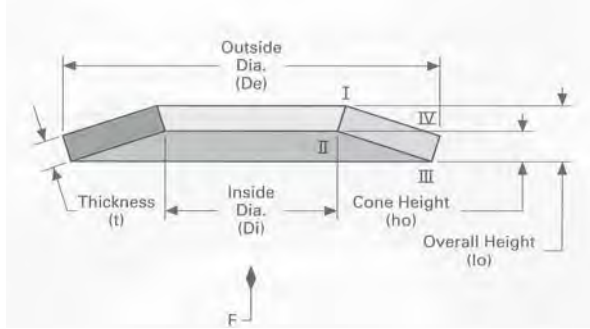


Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection	
									Defl. Force		Defl. Force		Defl. Force		Defl. Force		Defl. Force		Defl. Force	
									mm	N	mm	N	mm	N	mm	N	mm	N	mm	N
									Stress		Stress		Stress		Stress		Stress		Stress	
									δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII
									N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2	
DS6.2X18X0.8	6.20	18.00	0.80		0.50	1.30	0.63	1.41	0.08	179	0.15	337	0.23	479	0.3	607	0.38	726	0.45	838
DS8.2X18X0.5	8.20	18.00	0.50		0.60	1.10	1.20	0.79	0.09	92	0.18	161	0.27	209	0.36	243	0.45	265	0.54	280
DS8.2X18X0.7	8.20	18.00	0.70		0.55	1.25	0.79	1.11	0.08	161	0.17	297	0.25	412	0.33	510	0.41	596	0.5	674
DS8.2X18X0.8	8.20	18.00	0.80		0.50	1.30	0.63	1.27	0.08	193	0.15	364	0.23	516	0.3	655	0.38	783	0.45	904
DS8.2X18X1	8.20	18.00	1.00		0.40	1.40	0.40	1.58	0.06	260	0.12	505	0.18	739	0.24	963	0.3	1181	0.36	1395
DS9.2X18X0.45	9.20	18.00	0.45		0.60	1.05	1.33	0.66	0.09	80	0.18	138	0.27	176	0.36	200	0.45	214	0.54	220
DS9.2X18X0.7	9.20	18.00	0.70		0.50	1.20	0.71	1.03	0.08	147	0.15	274	0.23	383	0.3	480	0.38	566	0.45	647
DS9.2X18X1	9.20	18.00	1.00		0.40	1.40	0.40	1.48	0.06	276	0.12	536	0.18	784	0.24	1023	0.3	1254	0.36	1481
DS8.2X20X0.6	8.20	20.00	0.60		0.70	1.30	1.17	1.20	0.11	141	0.21	246	0.32	322	0.42	375	0.53	412	0.63	438
DS8.2X20X0.7	8.20	20.00	0.70		0.65	1.35	0.93	1.40	0.23	267	0.89	510	1.19	729	353	924	550	1095	790	1242
DS8.2X20X0.8	8.20	20.00	0.80		0.60	1.40	0.75	1.60	0.1	168	0.2	303	0.29	411	0.39	498	0.49	569	0.59	630
DSX8.2X20X0.9	8.20	20.00	0.90		0.55	1.45	0.61	1.80	0.09	199	0.18	369	0.27	514	0.36	639	0.45	751	0.54	854
DS8.2X20X1	8.20	20.00	1.00		0.55	1.55	0.55	2.10	0.136	245	0.303	472	0.503	682	734	874	998	1048	1293	1205
DS10.2X20X0.4	10.20	20.00	0.40		0.50	0.90	1.25	0.70	0.08	233	0.17	441	0.25	627	0.33	796	0.41	954	0.5	1103
DS10.2X20X0.5	10.20	20.00	0.50		0.65	1.15	1.30	0.90	0.177	232	0.382	449	0.613	651	871	838	1156	1011	1467	1169
DS10.2X20X0.8	10.20	20.00	0.80		0.55	1.35	0.69	1.50	0.08	306	0.17	583	0.25	837	0.33	1073	0.41	1294	0.5	1508
DS10.2X20X0.9	10.20	20.00	0.90		0.55	1.45	0.61	1.60	0.216	247	0.458	480	0.727	698	1023	901	1346	1089	1696	1262
DS10.2X20X1	10.20	20.00	1.00		0.55	1.55	0.55	1.80	0.08	35	0.15	61	0.23	79	0.3	91	0.38	99	0.45	103
DS10.2X20X1.1	10.20	20.00	1.10		0.45	1.55	0.41	2.00	-4	157	15	300	56	428	120	543	206	642	315	728
DS10.2X20X1.25	10.20	20.00	1.25		0.50	1.75	0.40	2.30	0.1	94	0.2	161	0.29	208	0.39	237	0.89	254	0.59	264
DS10.2X20X1.5	10.20	20.00	1.50		0.30	1.80	0.20	2.70	-15	261	8	498	69	711	168	899	305	1063	479	1203
DS11.2X22.5X0.6	11.20	22.50	0.60		0.80	1.40	1.33	1.40	0.08	191	0.17	357	0.25	502	0.33	631	0.41	748	0.5	858
DS11.2X22.5X0.8	11.20	22.50	0.80		0.65	1.45	0.81	1.90	0.129	258	0.285	499	0.469	723	679	929	917	1118	1182	1289
DS11.2X22.5X1	11.20	22.50	1.00		0.65	1.65	0.65	2.30	0.08	257	0.17	485	0.25	690	0.33	877	0.41	1050	0.5	1215
DS11.2X22.5X1.25	11.20	22.50	1.25		0.50	1.75	0.40	2.90	0.166	277	0.359	537	0.580	780	828	1005	1102	1212	1405	1403
DS8.2X23X0.7	8.20	23.00	0.70		0.80	1.50	1.14	2.00	0.08	337	0.17	642	0.25	922	0.33	1181	0.41	1425	0.5	1660
									0.203	296	0.434	575	0.691	836	976	1080	1288	1307	1627	1516
									0.07	335	0.14	652	0.2	953	0.27	1241	0.34	1521	0.41	1795
									0.222	242	0.461	472	0.719	691	995	898	1290	1093	1602	1277
									0.08	544	0.15	1059	0.23	1549	0.3	2020	0.38	2477	0.45	2925
									0.283	303	0.588	592	0.916	867	1266	1127	1639	1373	2034	1605
									0.05	517	0.09	1026	0.14	1529	0.18	2027	0.23	2521	0.27	3013
									0.254	187	0.515	368	0.785	544	1063	715	1349	881	1643	1042
									0.12	160	0.24	274	0.36	351	0.48	399	0.6	425	0.72	439
									-23	302	-1	576	66	821	178	1038	336	1227	538	1387
									0.1	195	0.2	357	0.29	493	0.39	608	0.49	707	0.59	798
									93	253	215	488	368	704	550	901	762	1079	1004	1239
									0.1	334	0.2	627	0.29	887	0.39	1121	0.49	1335	0.59	1538
									0.162	288	0.354	557	0.575	807	827	1039	1108	1251	1419	1445
									0.08	424	0.15	824	0.23	1206	0.3	1573	0.38	1929	0.45	2278
									0.224	234	0.465	457	0.724	669	1001	869	1296	1059	1608	1237
									0.12	183	0.24	321	0.36	422	0.48	493	0.6	544	0.72	581
									37	245	119	469	244	670	413	850	626	1007	882	1143

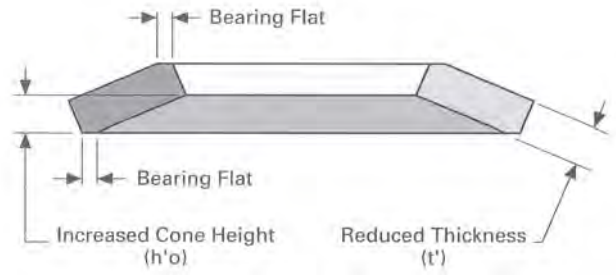
Disc Springs to DIN 2093



Disc Spring without Bearing Flats



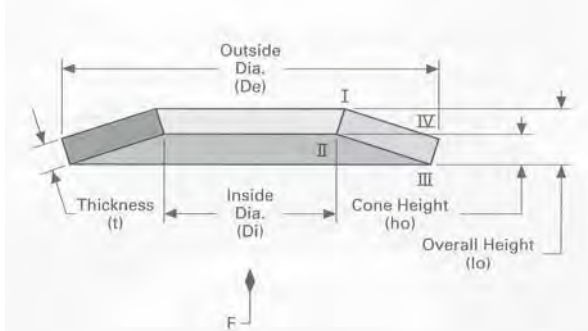
Disc Spring with Bearing Flats



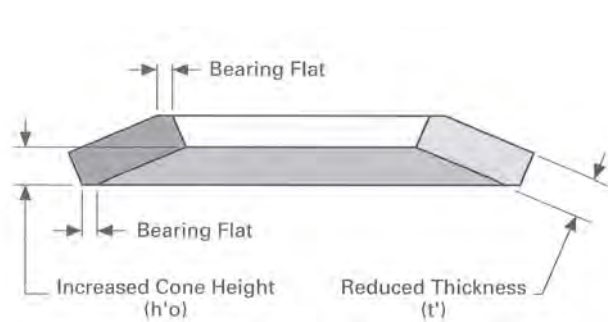
Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection												
									Defl. Force		Defl. Force		Defl. Force		Defl. Force		Defl. Force		Defl. Force												
									mm	N	mm	N	mm	N	mm	N	mm	N	mm	N	mm	N	mm	N							
									Stress		Stress		Stress		Stress		Stress		Stress												
									δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII											
									N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2												
DS8.2X23X0.8	8.20	23.00	0.80	0.75	1.55	0.94	2.30	0.11	214	0.23	385	0.34	521	0.45	630	0.56	719	0.68	795	92	237	223	454	392	653	600	831	846	991	1131	1131
DS8.2X23X0.9	8.20	23.00	0.90	0.70	1.60	0.78	2.60	0.11	248	0.21	457	0.32	634	0.42	785	0.53	919	0.63	1041	139	227	312	438	519	632	759	808	1032	969	1340	1112
DS8.2X23X1	8.20	23.00	1.00	0.70	1.70	0.70	2.80	0.11	309	0.21	595	0.32	835	0.42	1048	0.53	1240	0.63	1419	178	241	389	465	634	673	913	863	1225	1037	1571	1194
DS10.2X23X0.9	10.20	23.00	0.90	0.75	1.65	0.83	2.40	0.11	295	0.23	539	0.34	742	0.45	912	0.56	1058	0.68	1189	115	289	269	555	459	800	687	1024	953	1225	1257	1404
DS10.2X23X1	10.20	23.00	1.00	0.70	1.70	0.70	2.60	0.11	339	0.21	631	0.32	886	0.42	1112	0.53	1315	0.63	1506	158	277	349	535	573	774	829	994	1119	1195	1441	1377
DS10.2X23X1.25	10.20	23.00	1.25	0.65	1.90	0.52	3.30	0.1	537	0.2	1029	0.29	1483	0.39	1907	0.49	2310	0.59	2699	244	287	516	557	816	810	1145	1048	1502	1269	1887	1473
DS12.2X23X1	12.20	23.00	1.00	0.60	1.60	0.60	2.30	0.09	296	0.18	560	0.27	797	0.36	1015	0.45	1217	0.54	1410	155	263	334	510	538	740	767	954	1020	1152	1299	1334
DS12.2X23X1.25	12.20	23.00	1.25	0.60	1.85	0.48	2.90	0.09	532	0.18	1023	0.27	1483	0.36	1916	0.45	2331	0.54	2734	231	304	488	591	768	862	1074	1117	1404	1356	1760	1579
DS12.2X23X1.5	12.20	23.00	1.50	0.50	2.00	0.33	3.50	0.08	705	0.15	1382	0.23	2036	0.3	2673	0.38	3297	0.45	3912	278	273	573	535	886	785	1215	1025	1562	1253	1926	1470
DS10.2X25X1	10.20	25.00	1.00	0.75	1.75	0.75	3.20	0.11	311	0.23	575	0.34	801	0.45	997	0.56	1172	0.68	1333	136	244	304	470	504	679	736	871	1000	1045	1295	1201
DS12.2X25X0.7	12.20	25.00	0.70	0.90	1.60	1.29	2.10	0.14	219	0.27	378	0.41	487	0.54	558	0.68	600	0.81	624	-13	309	20	589	99	841	225	1064	0.96	1259	614	1425
DS12.2X25X0.9	12.20	25.00	0.90	0.70	1.60	0.78	2.60	0.11	233	0.21	429	0.32	595	0.42	737	0.53	862	0.63	977	99	239	227	461	382	666	565	853	776	1023	1015	1176
DS12.2X25X1	12.20	25.00	1.00	0.80	1.80	0.80	2.90	0.12	371	0.24	682	0.36	943	0.48	1165	0.6	1359	0.72	1534	120	308	276	593	469	855	699	1095	965	1312	1267	1507
DS12.2X25X1.25	12.20	25.00	1.25	0.70	1.95	0.56	3.70	0.11	526	0.21	1002	0.32	1436	0.42	1837	0.53	2214	0.63	2577	205	291	438	564	699	821	988	1059	1305	1281	1649	1485
DS12.2X25X1.5	12.20	25.00	1.50	0.55	2.05	0.37	4.40	0.08	634	0.17	1238	0.25	1818	0.33	2379	0.41	2926	0.5	3464	249	239	516	468	800	686	1101	894	1419	1091	1755	1277
DS10.2X28X0.8	10.20	28.00	0.80	0.95	1.75	1.19	3.40	0.14	229	0.29	399	0.43	521	0.57	605	0.71	662	0.86	701	23	232	88	443	195	633	343	802	532	950	763	1076
DS10.2X28X1	10.20	28.00	1.00	0.90	1.90	0.90	4.20	0.14	328	0.27	595	0.41	810	0.54	984	0.68	1130	0.81	1257	101	238	239	456	415	656	628	837	878	998	1166	1141
DS10.2X28X1.25	10.20	28.00	1.25	0.80	2.05	0.64	5.20	0.12	460	0.24	866	0.36	1227	0.48	1553	0.6	1853	0.72	2137	186	226	402	438	647	634	921	616	1225	982	1559	1134
DS10.2X28X1.5	10.20	28.00	1.50	0.70	2.20	0.47	6.30	0.11	617	0.21	1190	0.32	1726	0.42	2235	0.53	2723	0.63	3197	247	211	517	411	809	600	1124	777	1461	943	1821	1097
DS12.2X28X1	12.20	28.00	1.00	0.95	1.95	0.95	3.90	0.14	380	0.29	683	0.43	923	0.57	1114	0.71	1268	0.86	1400	80	288	201	553	362	765	564	1013	807	1208	1090	1379
DS12.2X28X1.25	12.20	28.00	1.25	0.85	2.10	0.68	4.90	0.13	530	0.26	991	0.38	1395	0.51	1755	0.64	2083	0.77	2390	169	277	371	534	605	774	872	994	1172	1196	1504	1379
DS12.2X28X1.5	12.20	28.00	1.50	0.75	2.25	0.50	5.90	0.11	709	0.23	1361	0.34	1966	0.45	2535	0.56	3077	0.68	3603	235	261	496	506	782	738	1094	955	1431	1157	1793	1345
DS14.2X28X0.8	14.20	28.00	0.80	1.00	1.80	1.25	2.90	0.15	287	0.3	497	0.45	644	0.6	741	0.75	801	0.9	839	-7	319	31	609	116	870	246	1101	422	1304	643	1477
DS14.2X28X1	14.20	28.00	1.00	0.80	1.80	0.80	3.60	0.12	303	0.24	556	0.36	769	0.48	949	0.6	1107	0.72	1250	94	254	218	490	371	707	553	906	765	1086	1006	1247
DS14.2X28X1.25	14.20	28.00	1.25	0.85	2.10	0.68	4.50	0.13	570	0.26	1065	0.38	1500	0.51	1887	0.64	2240	0.77	2570	161	315	356	609	583	882	844	1134	1138	1365	1465	1574
DS14.2X28X1.5	14.20	28.00	1.50	0.65	2.15	0.43	5.40	0.1	633	0.2	1227	0.29	1789	0.39	2324	0.49	2841	0.59	3346	216	246	451	479	706	701	980	910	1274	1106	1586	1291



Disc Spring without Bearing Flats



Disc Spring with Bearing Flats

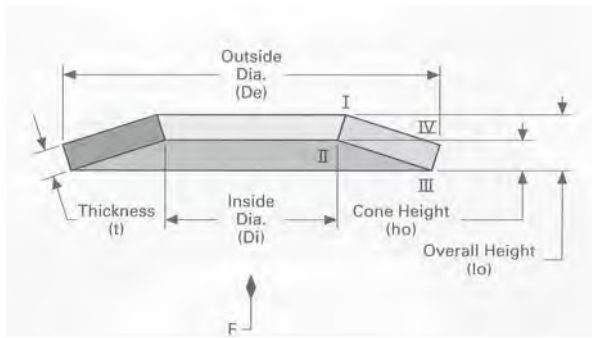


Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection					
									Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N
									Stress		Stress		Stress		Stress		Stress		Stress		Stress			
	δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII	δII	δIII				
DS12.2X31.5X1.25	12.20	31.50	1.25	0.95	2.20	0.76	6.50	0.14	481	0.29	890	0.43	1238	0.57	1539	0.71	1805	0.86	2050	137	237			
DS12.2X31.5X1.5	12.20	31.50	1.50	0.85	2.35	0.57	7.80	0.13	641	0.26	1219	0.38	1746	0.51	2232	0.64	2688	0.77	3126	202	225			
DS16.3X31.5X0.8	16.30	31.50	0.80	1.05	1.85	1.31	3.60	0.16	255	0.32	438	0.47	563	0.63	642	0.79	687	0.95	711	-19	278			
DS16.3X31.5X1.25	16.30	31.50	1.25	0.90	2.15	0.72	5.60	0.14	498	0.27	926	0.41	1296	0.54	1621	0.68	1913	0.81	2184	124	275			
DS16.3X31.5X1.5	16.30	31.50	1.50	0.90	2.40	0.60	6.70	0.14	785	0.27	1485	0.41	2116	0.54	2693	0.68	3230	0.81	3742	186	307			
DS16.3X31.5X1.75	16.30	31.50	1.75	0.70	2.45	0.40	7.80	0.11	850	0.21	1655	0.32	2421	0.42	3157	0.53	3871	0.63	4572	223	243			
DS16.3X31.5X2	16.30	31.50	2.00	0.75	2.75	0.38	9.00	0.11	1342	0.23	2618	0.34	3841	0.45	5022	0.56	6173	0.68	7304	282	292			
DS12.2X34X1	12.20	34.00	1.00	1.25	2.25	1.25	6.20	0.19	420	0.38	727	0.56	942	0.75	1084	0.94	1172	1.13	1228	12	265			
DS12.2X34X1.25	12.20	34.00	1.25	1.10	2.35	0.88	7.80	0.17	521	0.33	946	0.5	1292	0.66	1576	0.83	1815	0.99	2026	111	242			
DS12.2X34X1.5	12.20	34.00	1.50	1.00	2.50	0.67	9.30	0.15	687	0.3	1287	0.45	1816	0.6	2288	0.75	2721	0.9	3127	183	232			
DS14.2X34X1.25	14.20	34.00	1.25	1.15	2.40	0.92	7.40	0.17	585	0.35	1056	0.52	1434	0.69	1738	0.86	1989	1.04	2206	93	283			
DS14.2X34X1.5	14.20	34.00	1.50	1.05	2.55	0.70	8.80	0.16	768	0.32	1432	0.47	2010	0.63	2521	0.79	2984	0.95	3415	167	273			
DS16.3X34X1.5	16.30	34.00	1.50	1.05	2.55	0.70	8.20	0.16	812	0.32	1514	0.47	2126	0.63	2666	0.79	3155	0.95	3612	158	304			
DS16.3X34X2	16.30	34.00	2.00	0.85	2.85	0.43	11.00	0.13	1284	0.26	2491	0.38	3634	0.51	4727	0.64	5783	0.77	6816	260	274			
DS18.3X35.5X0.9	18.30	35.50	0.90	1.15	2.05	1.28	5.10	0.17	303	0.35	523	0.52	675	0.69	773	0.86	832	1.04	867	-12	264			
DS18.3X35.5X1.25	18.30	35.50	1.25	1.00	2.25	0.80	7.10	0.15	464	0.3	853	0.45	1179	0.6	1457	0.75	1699	0.9	1918	91	251			
DS18.3X35.5X2	18.30	35.50	2.00	0.80	2.80	0.40	11.40	0.12	1139	0.24	2217	0.36	3243	0.48	4230	0.6	5187	0.72	6126	230	249			
DS14.2X40X1.25	14.20	40.00	1.25	1.40	2.65	1.12	11.00	0.21	590	0.42	1038	0.63	1369	0.84	1607	1.05	1778	1.26	1907	45	250			
DS14.2X40X1.5	14.20	40.00	1.50	1.25	2.75	0.83	13.00	0.19	709	0.38	1296	0.56	1783	0.75	2191	0.94	2542	1.13	2857	123	231			
DS14.2X40X2	14.20	40.00	2.00	1.05	3.05	0.53	17.00	0.16	1111	0.32	2126	0.47	3062	0.63	3935	0.79	4763	0.95	5563	228	213			
DS16.3X40X1.5	16.30	40.00	1.50	1.05	2.55	0.70	12.00	0.16	551	0.32	1027	0.47	1442	0.63	1808	0.79	2140	0.95	2449	122	194			
DS16.3X40X2	16.30	40.00	2.00	1.10	3.10	0.55	16.00	0.17	1222	0.33	2329	0.5	3343	0.66	4283	0.83	5169	0.99	6021	216	246			
DS18.3X40X2	18.30	40.00	2.00	1.15	3.15	0.58	16.00	0.17	1355	0.35	2574	0.52	3682	0.69	4701	0.86	5656	1.04	6571	209	285			
DS20.4X40X1	20.40	40.00	1.00	1.30	2.30	1.30	7.00	0.2	375	0.39	645	0.59	830	0.78	948	0.98	1017	1.17	1055	-15	261			
DS20.4X40X1.5	20.40	40.00	1.50	1.15	2.65	0.77	11.00	0.17	702	0.35	1296	0.52	1801	0.69	2237	0.86	2621	1.04	2974	108	265			
DS20.4X40X2	20.40	40.00	2.00	1.10	3.10	0.55	15.00	0.17	1348	0.33	2569	0.5	3687	0.66	4724	0.83	5701	0.99	6641	203	296			

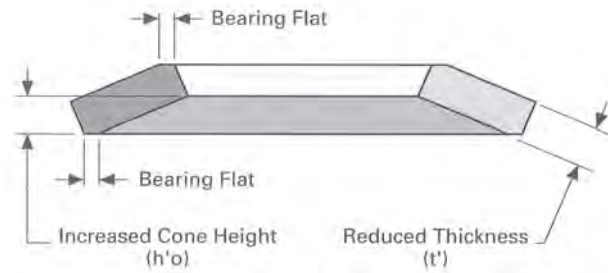
Disc Springs to DIN 2093



Disc Spring without Bearing Flats



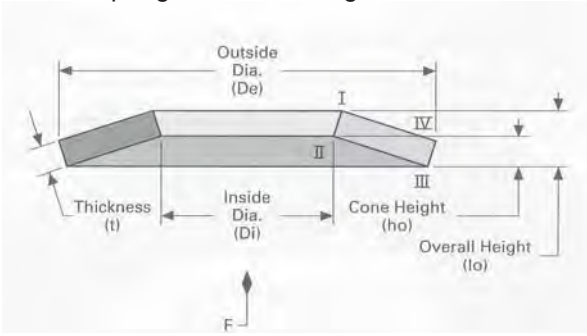
Disc Spring with Bearing Flats



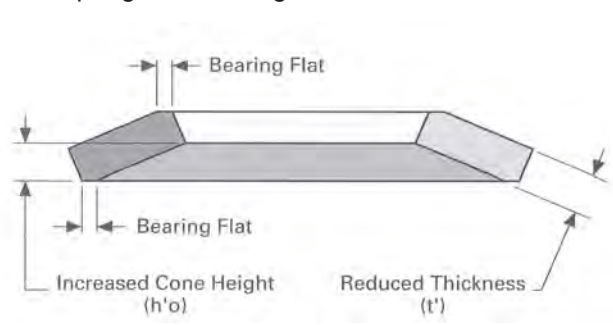
Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection												
									Defl. Force		Defl. Force		Defl. Force		Defl. Force		Defl. Force		Defl. Force												
									mm	N	mm	N	mm	N	mm	N	mm	N	mm	N	mm	N									
Stress		Stress		Stress		Stress		Stress		Stress		Stress		Stress		Stress		Stress													
δII		δIII		δII		δIII		δII		δIII		δII		δIII		δII		δIII		δII											
N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2											
DS20.4X40X2.25	20.40	40.00	2.25	0.90	3.15	0.40	16.00	0.14	1428	0.27	2778	0.41	4064	0.54	5301	0.68	6500	0.81	7677	229	246	476	480	742	702	1026	913	1328	1112	1648	1300
DS20.4X40X2.5	20.40	40.00	2.50	0.95	3.45	0.38	18.00	0.14	2045	0.29	3989	0.43	5849	0.57	7643	0.71	9390	0.86	11106	275	284	571	555	887	813	1223	1058	1579	1290	1956	1510
DS22.4X45X1.25	22.40	45.00	1.25	1.60	2.85	1.28	12.00	0.24	689	0.48	1189	0.72	1534	0.96	1757	1.2	1891	1.44	1969	-13	307	20	586	98	837	221	1060	389	1253	602	1419
DS22.4X45X1.75	22.40	45.00	1.75	1.30	3.05	0.74	16.00	0.2	963	0.39	1783	0.59	2488	0.78	3100	0.98	3646	1.17	4150	119	266	267	514	446	742	654	952	892	1144	1160	1316
DS22.4X45X2.5	22.40	45.00	2.50	1.00	3.50	0.40	23.00	0.15	1695	0.3	3298	0.45	4825	0.6	6292	0.75	7716	0.9	9113	224	234	465	457	724	669	1001	869	1296	1059	1608	1237
DS18.3X50X1.25	18.30	50.00	1.25	1.60	2.85	1.28	17.00	0.24	500	0.48	864	0.72	1114	0.96	1276	1.2	1373	1.44	1430	3	201	42	382	118	545	232	689	382	814	569	920
DS18.3X50X1.5	18.30	50.00	1.50	1.80	3.30	1.20	20.00	0.27	906	0.54	1578	0.81	2058	1.08	2386	1.35	2603	1.62	2752	23	261	92	498	208	711	371	900	581	1066	837	1208
DS18.3X50X2	18.30	50.00	2.00	1.50	3.50	0.75	27.00	0.23	1211	0.45	2241	0.68	3123	0.9	3887	1.13	4567	1.35	5193	145	229	323	441	533	636	776	815	1051	977	1358	1123
DS18.3X50X2.5	18.30	50.00	2.50	1.60	4.10	0.64	33.00	0.24	2312	0.48	4351	0.72	6163	0.96	7799	1.2	9305	1.44	10731	233	285	503	551	809	798	1153	1026	1533	1236	1951	1426
DS18.3X50X3	18.30	50.00	3.00	1.40	4.40	0.47	40.00	0.21	3097	0.42	5975	0.63	8670	0.84	11224	1.05	13673	1.26	16058	309	266	647	518	1013	755	1407	977	1829	1186	2280	1379
DS20.4X50X2	20.40	50.00	2.00	1.50	3.50	0.75	26.00	0.23	1243	0.45	2300	0.68	3205	0.9	3990	1.13	4687	1.35	5330	136	244	304	470	504	679	736	871	1000	1045	1295	1201
DS20.4X50X2.5	20.40	50.00	2.50	1.35	3.85	0.54	32.00	0.2	1862	0.41	3555	0.61	5109	0.81	6554	1.01	7919	1.22	9234	215	240	456	467	723	679	1015	876	1334	1060	1678	1229
DS22.4X50X2	22.40	50.00	2.00	1.60	3.60	0.80	25.00	0.24	1427	0.48	2622	0.72	3625	0.96	4478	1.2	5222	1.44	5897	125	286	285	552	482	796	715	1018	985	1220	1290	1401
DS22.4X50X2.5	22.40	50.00	2.50	1.40	3.90	0.56	31.00	0.21	2023	0.42	3850	0.63	5518	0.84	7060	1.05	8510	1.26	9903	209	270	447	525	711	763	1004	984	1324	1190	1672	1379
DS25.4X50X1.25	25.40	50.00	1.25	1.60	2.85	1.28	14.00	0.24	565	0.48	975	0.72	1258	0.96	1440	1.2	1550	1.44	1615	-11	254	15	484	77	691	176	875	312	1035	485	1172
DS25.4X50X1.5	25.40	50.00	1.50	1.60	3.10	1.07	17.00	0.24	808	0.48	1431	0.72	1900	0.96	2250	1.2	2512	1.44	2719	32	276	101	528	207	757	349	963	528	1145	744	1304
DS25.4X50X2	25.40	50.00	2.00	1.40	3.40	0.70	23.00	0.21	1226	0.42	2285	0.63	3208	0.84	4024	1.05	4762	1.26	5451	128	264	285	510	470	738	682	948	923	1140	1193	1315
DS25.4X50X2.25	25.40	50.00	2.25	1.50	3.75	0.67	26.00	0.23	1821	0.45	3413	0.68	4816	0.9	6070	1.13	7217	1.35	8296	165	312	362	603	591	874	853	1124	1147	1353	1473	1562
DS25.4X50X2.5	25.40	50.00	2.50	1.40	3.90	0.56	29.00	0.21	2154	0.42	4101	0.63	5877	0.84	7519	1.05	9063	1.26	10546	204	302	436	587	696	853	984	1102	1301	1332	1646	1545
DS25.4X50X3	25.40	50.00	3.00	1.10	4.10	0.37	34.00	0.17	2594	0.33	5067	0.5	7441	0.66	9737	0.83	11976	0.99	14180	249	249	515	487	798	714	1099	930	1418	1135	1753	1328
DS28.5X56X1.5	28.50	56.00	1.50	1.95	3.45	1.30	21.00	0.29	966	0.59	1664	0.88	2141	1.17	2445	1.46	2622	1.76	2721	-17	299	9	571	79	814	193	1030	350	1218	551	1379
DS28.5X56X2	28.50	56.00	2.00	1.60	3.60	0.80	29.00	0.24	1213	0.48	2228	0.72	3081	0.96	3806	1.2	4438	1.44	5012	94	255	218	492	371	710	553	909	765	1090	1006	1251
DS28.5X56X2.5	28.50	56.00	2.50	1.70	4.20	0.68	36.00	0.26	2283	0.51	4270	0.77	6014	1.02	7565	1.28	8978	1.53	10303	161	316	356	611	583	885	844	1138	1138	1369	1464	1580
DS28.5X56X3	28.50	56.00	3.00	1.30	4.30	0.43	43.00	0.2	2539	0.39	4920	0.59	7170	0.78	9316	0.98	11388	1.17	13414	216	247	451	481	706	703	980	913	1274	1110	1586	1296
DS20.4X60X2	20.40	60.00	2.00	2.10	4.10	1.05	39.00	0.32	1505	0.63	2671	0.95	3556	1.26	4221	1.58	4727	1.89	5132	69	252	184	483	343	692	547	878	796	1044	1090	1187
DS20.4X60X2.5	20.40	60.00	2.50	1.80	4.30	0.72	49.00	0.27	1900	0.54	3533	0.81	4945	1.08	6184	1.35	7297	1.62	8331	168	225	368	434	602	627	868	804	1168	965	1501	1110



Disc Spring without Bearing Flats



Disc Spring with Bearing Flats



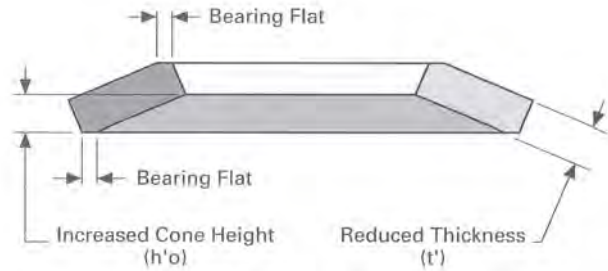
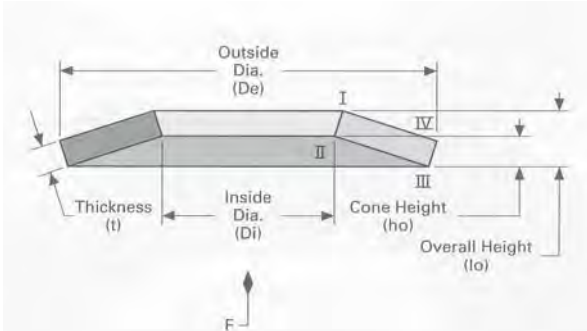
Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection	
									Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N
									Stress		Stress		Stress		Stress		Stress		Stress	
									σII	σIII	σII	σIII	σII	σIII	σII	σIII	σII	σIII	σII	σIII
									N/mm ²		N/mm ²		N/mm ²		N/mm ²		N/mm ²		N/mm ²	
DS20.4X60X3	20.40	60.00	3.00		1.70	4.70	0.57	59.00	0.26	2760	0.51	5248	0.77	7515	1.02	9605	1.28	11569	1.53	13453
									239	231	508	448	806	651	1133	839	1490	1013	1876	1173
DS25.4X60X2.5	25.40	60.00	2.50		1.90	4.40	0.76	46.00	0.29	2178	0.57	4025	0.86	5599	1.14	6959	1.43	8164	1.71	9271
									144	277	323	533	538	770	788	987	1074	1184	1395	1361
DS25.4X60X3	25.40	60.00	3.00		1.65	4.65	0.55	55.00	0.25	2782	0.5	5304	0.74	7611	0.99	9751	1.24	11768	1.49	13709
									213	253	452	491	719	713	1012	921	1332	1114	1678	1291
DS30.5X60X2.5	30.50	60.00	2.50		1.80	4.30	0.72	41.00	0.27	2172	0.54	4039	0.81	5653	1.08	7070	1.35	8342	1.62	9524
									138	298	308	576	510	833	745	1070	1012	1285	1311	1481
DS30.5X60X2.75	30.50	60.00	2.75		2.00	4.75	0.73	45.00	0.3	3232	0.6	6002	0.9	8391	1.2	10482	1.5	12356	1.8	14093
									166	366	372	707	617	1022	903	1312	1228	1576	1594	1815
DS30.5X60X3	30.50	60.00	3.00		1.70	4.70	0.57	59.00	0.26	3155	0.51	6000	0.77	8591	1.02	10981	1.28	13226	1.53	15380
									204	307	437	596	699	867	990	1119	1309	1353	1658	1569
DS30.5X60X3.5	30.50	60.00	3.50		1.50	5.00	0.43	58.00	0.23	4039	0.45	7830	0.68	11417	0.9	14843	1.13	18153	1.35	21389
									255	288	532	562	832	821	1154	1066	1499	1297	1866	1514
DS31X63X1.8	31.00	63.00	1.80		2.35	4.15	1.31	33.00	0.35	1566	0.71	2697	1.06	3467	1.41	3955	1.76	4238	2.12	4393
									-19	332	12	633	92	903	222	1142	402	1351	631	1528
DS31X63X2.5	31.00	63.00	2.50		1.75	4.25	0.70	46.00	0.26	1850	0.53	3450	0.79	4843	1.05	6075	1.31	7189	1.58	8229
									127	252	282	487	464	704	674	905	912	1088	1176	1254
DS31X63X3	31.00	63.00	3.00		1.80	4.80	0.60	56.00	0.27	3046	0.54	5764	0.81	8214	1.08	10452	1.35	12536	1.62	14525
									187	292	403	566	648	822	923	1060	1226	1280	1559	1481
DS31X63X3.5	31.00	63.00	3.50		1.40	4.90	0.40	65.00	0.21	3301	0.42	6422	0.63	9395	0.84	12253	1.05	15025	1.26	17746
									224	231	466	452	725	661	1002	860	1296	1047	1608	1224
DS25.5X70X2	25.50	70.00	2.00		2.50	4.50	1.25	52.00	0.38	1590	0.75	2753	1.13	3565	1.5	4101	1.88	4437	2.25	4647
									10	252	67	480	169	685	318	866	512	1024	753	1159
DS30.5X70X2.5	30.50	70.00	2.50		2.40	4.90	0.96	61.00	0.36	2421	0.72	4348	1.08	5866	1.44	7065	1.8	8031	2.16	8851
									78	293	198	562	359	807	562	1028	806	1225	1092	1399
DS30.5X70X3	30.50	70.00	3.00		2.10	5.10	0.70	73.00	0.32	2941	0.63	5483	0.95	7698	1.26	9656	1.58	11426	1.89	13080
									155	266	342	513	560	742	810	953	1093	1145	1407	1320
DS35.5X70X3	35.50	70.00	3.00		2.10	5.10	0.70	67.00	0.32	3162	0.63	5897	0.95	8278	1.26	10384	1.58	12287	1.89	14065
									147	302	327	584	539	846	784	1087	1060	1307	1369	1507
DS35.5X70X4	35.50	70.00	4.00		1.80	5.80	0.45	90.00	0.27	5376	0.54	10393	0.81	15115	1.08	19604	1.35	23923	1.62	28137
									250	294	523	573	821	837	1142	1085	1486	1319	1855	1537
DS40.5X70X4	40.50	70.00	4.00		1.60	5.60	0.40	80.00	0.24	5130	0.48	9980	0.72	14601	0.96	19042	1.2	23351	1.44	27579
									240	294	500	574	780	841	1079	1094	1399	1333	1737	1558
DS40.5X70X5	40.50	70.00	5.00		1.20	6.20	0.24	100.00	0.18	6977	0.36	13806	0.54	20515	0.72	27128	0.9	33672	1.08	40173
									271	244	553	460	846	709	1150	929	1465	1142	1792	1348
DS36X71X2	36.00	71.00	2.00		2.60	4.60	1.30	46.00	0.39	1895	0.78	3265	1.17	4201	1.56	4796	1.95	5144	2.34	5337
									-19	330	11	629	88	897	214	1135	388	1342	610	1519
DS36X71X2.5	36.00	71.00	2.50		2.00	4.50	0.80	58.00	0.3	1838	0.6	3377	0.9	4669	1.2	5768	1.5	6725	1.8	7595
									92	247	212	479	361	687	538	880	744	1055	978	1212
DS36.71X4	36.00	71.00	4.00		1.60	5.60	0.40	92.00	0.24	4511	0.48	8776	0.72	12840	0.96	16745	1.2	20535	1.44	24252
									230	245	478	478	744	700	1029	911	1332	1109	1653	1296
DS31X80X2.5	31.00	80.00	2.50		2.80	5.30	1.12	84.00	0.42	2404	0.84	4228	1.26	5573	1.68	6543	2.1	7239	2.52	7764
									39	263	121	502	247	718	417	911	631	1081	888	1227
DS31X80X3	31.00	80.00	3.00		2.50	5.50	0.83	101.00	0.38	2887	0.75	5279	1.13	7261	1.5	8923	1.88	10352	2.25	11634
									115	242	266	466	451	671	671	857	926	1025	1215	1175
DS31X80X4	31.00	80.00	4.00		2.10	6.10	0.53	134.00	0.32	4525	0.63	8657	0.95	12467	1.26	16023	1.58	19394	1.89	22651
									218	224	461	435	729	632	1021	817	1338	989	1679	1147
DS36X80X3	36.00	80.00	3.00		2.70	5.70	0.90	94.00	0.41	3464	0.81	6271	1.22	8540	1.62	10383	2.03	11919	2.43	13261
									95	300	231	577	407	830	623	1060	879	1265	1176	1448
DS36X80X4	36.00	80.00	4.00		2.20	6.20	0.55	126.00	0.33	5059	0.66	9645	0.99	13841	1.32	17732	1.65	21400	1.98	24929
									208	265	444	514	705	747	994	965	1310	1167	1652	1353

Disc Springs to DIN 2093



Disc Spring without Bearing Flats

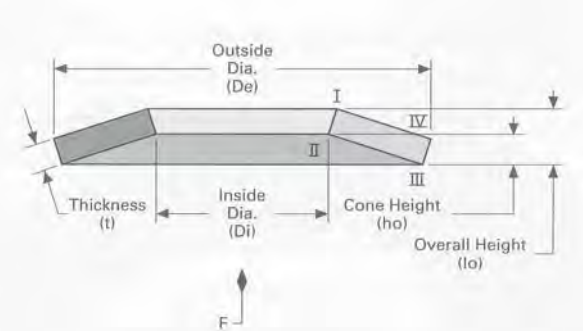
Disc Spring with Bearing Flats



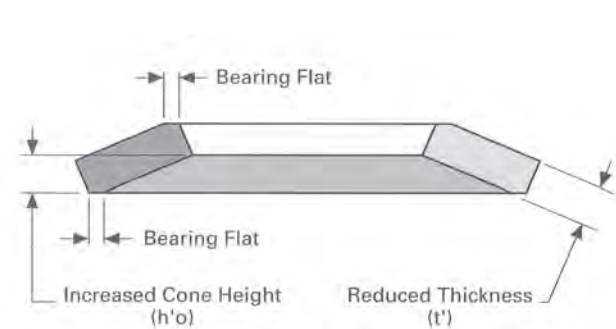
Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection									
									Defl. mm		Force N		Defl. mm		Force N		Defl. mm		Force N		Defl. mm		Force N		Defl. mm		Force N	
									σII	σIII	σII	σIII	σII	σIII	σII	σIII	σII	σIII	σII	σIII	σII	σIII	σII	σIII	σII	σIII	σII	σIII
DS41X80X2.25	41.00	80.00	2.25	2.95	5.20	1.31	65.00	0.44	2452	0.89	4218	1.33	5419	1.77	6177	2.21	6613	2.66	6846									
DS41X80X3	41.00	80.00	3.00	2.30	5.30	0.77	87.00	0.35	2817	0.69	5201	1.04	7228	1.38	8975	1.73	10518	2.07	11933									
DS41X80X4	41.00	80.00	4.00	2.20	6.20	0.55	116.00	0.33	5407	0.66	10309	0.99	14795	1.32	18953	1.65	22874	1.98	26646									
DS46X90X2.5	46.00	90.00	2.50	3.20	5.70	1.28	92.00	0.48	2800	0.96	4833	1.44	6234	1.92	7140	2.4	7684	2.88	8003									
DS46X90X3.5	46.00	90.00	3.50	2.50	6.00	0.71	129.00	0.38	3675	0.75	6839	1.13	9581	1.5	11991	1.88	14131	2.25	16180									
DS46X90X5	46.00	90.00	5.00	2.00	7.00	0.40	184.00	0.3	6888	0.6	13401	0.9	19605	1.2	25568	1.5	31354	1.8	37031									
DS41X100X4	41.00	100.00	4.00	3.20	7.20	0.80	205.00	0.48	5535	0.96	10168	1.44	14059	1.92	17367	2.4	20251	2.88	22870									
DS41X100X5	41.00	100.00	5.00	2.75	7.75	0.55	256.00	0.41	7650	0.93	14585	1.24	20931	1.65	26814	2.06	32361	2.48	37698									
DS51X100X2.7	51.00	100.00	2.70	3.50	6.20	1.30	123.00	0.53	3165	1.05	5454	1.58	7021	2.1	8021	2.63	8609	3.15	8938									
DS51X100X3.5	51.00	100.00	3.50	2.80	6.30	0.80	160.00	0.42	3572	0.84	6563	1.26	9074	1.68	11209	2.1	13070	2.52	14760									
DS51X100X4	51.00	100.00	4.00	3.00	7.00	0.75	182.00	0.45	5482	0.9	10145	1.35	14136	1.8	17597	2.25	20674	2.7	23510									
DS51X100X5	51.00	100.00	5.00	2.80	7.80	0.56	228.00	0.42	8637	0.84	16442	1.26	23563	1.68	30147	2.1	36339	2.52	42287									
DS51X100X6	51.00	100.00	6.00	2.20	8.20	0.37	274.00	0.33	10401	0.66	20318	0.99	29837	1.32	39043	1.65	48022	1.98	56858									
DS51X100X7	51.00	100.00	7.00	6.55	9.20	0.40	319.00	0.33	13882	0.66	27110	0.99	39775	1.32	51972	1.65	63793	1.98	75331									
DS57X112X3	57.00	112.00	3.00	3.90	6.90	1.30	172.00	0.59	3865	1.17	6657	1.76	8565	2.34	9779	2.93	10489	3.51	10883									
DS57X112X4	57.00	112.00	4.00	3.20	7.20	0.80	229.00	0.48	4852	0.96	8914	1.44	12325	1.92	15224	2.4	17752	2.88	20048									
DS57X112X6	57.00	112.00	6.00	2.50	8.50	0.42	344.00	0.38	9672	0.75	18779	1.13	27421	1.5	35697	1.88	43707	2.25	51551									
DS41X125X4	41.00	125.00	4.00	4.20	8.20	1.05	344.00	0.63	5525	1.26	9801	1.89	13050	2.52	15492	3.15	17346	3.78	18833									
DS51X125X4	51.00	125.00	4.00	4.50	8.50	1.13	321.00	0.68	6602	1.35	11602	2.03	15283	2.7	17927	3.38	19817	4.05	21236									
DS51X125X5	51.00	125.00	5.00	3.90	8.90	0.78	401.00	0.59	8281	1.17	15258	1.76	21161	2.34	26222	2.93	30669	3.51	34732									
DS51X125X6	51.00	125.00	6.00	3.40	9.40	0.57	482.00	0.51	10568	1.02	20101	1.53	28779	2.04	36787	2.55	44307	3.06	51523									
DS61X125X5	61.00	125.00	5.00	4.00	9.00	0.80	367.00	0.6	9283	1.2	17054	1.8	23581	2.4	29129	3	33965	3.6	38358									
DS61X125X6	61.00	125.00	6.00	3.60	9.60	0.60	440.00	0.54	12323	1.08	23323	1.62	33234	2.16	42289	2.7	50722	3.24	58766									
DS61X125X8	61.00	125.00	8.00	7.50	10.90	0.45	587.00	0.435	21142	0.87	40862	1.305	59369	1.74	76871	2.175	93577	2.61	109695									
DS64X125X3.5	64.00	125.00	3.50	4.50	8.00	1.29	249.00	0.68	5635	1.35	9721	2.03	12530	2.7	14338	3.38	15416	4.05	16038									
DS64X125X5	64.00	125.00	5.00	3.50	8.50	0.70	355.00	0.53	7897	1.05	14352	1.58	20150	2.1	25274	2.63	29908	3.15	34236									



Disc Spring without Bearing Flats



Disc Spring with Bearing Flats

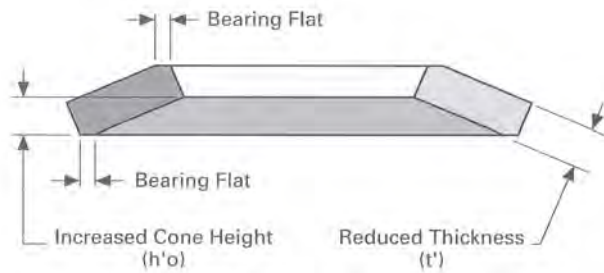
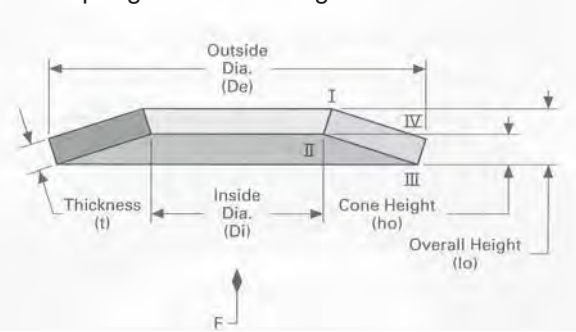


Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection			
									Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N
									Stress		Stress		Stress		Stress		Stress		Stress		Stress	
δII		δIII		δII		δIII		δII		δIII		δII		δIII		δII		δIII				
N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2		N/mm2				
DS64X125X6	64.00	125.00	6.00		3.60	9.60	0.60	426.00	0.54	12671	1.08	23982	1.62	34172	2.16	43484	2.7	52155	3.24	60426		
DS64X125X7	64.00	125.00	7.00	6.55	3.45	10.00	0.49	498.00	0.45	15783	0.9	30190	1.35	43427	1.8	55700	2.25	67216	2.7	78182		
DS64X125X8	64.00	125.00	8.00	7.50	3.10	10.60	0.39	569.00	0.39	19037	0.78	36993	1.17	54023	1.56	70281	1.95	85926	2.34	101111		
DS71X125X6	71.00	125.00	6.00		3.30	9.30	0.55	392.00	0.5	12107	0.99	23083	1.49	33127	1.98	42438	2.48	51217	2.97	59663		
DS71X125X8	71.00	125.00	8.00	7.40	3.00	10.40	0.38	522.00	0.36	18866	0.72	36709	1.08	53668	1.44	69883	1.8	85494	2.16	100639		
DS71X125X10	71.00	125.00	10.00	9.20	2.60	11.80	0.26	653.00	0.27	26003	0.54	51340	0.81	76087	1.08	100323	1.35	124124	1.62	147567		
DS72X140X3.8	72.00	140.00	3.80		4.90	8.70	1.29	338.00	0.74	6299	1.47	10861	2.21	13994	2.94	16003	3.68	17195	4.41	17877		
DS72X140X5	72.00	140.00	5.00		4.00	9.00	0.80	444.00	-16	306	1.3	585	2.5	834	202	1056	362	1249	567	1414		
DS72X140X8	72.00	140.00	8.00	7.50	3.70	11.20	0.46	711.00	0.6	7631	1.2	14019	1.8	19384	2.4	23944	3	27920	3.6	31530		
DS61X150X5	61.00	150.00	5.00		5.30	10.30	1.06	579.00	94	258	217	497	370	717	553	919	764	1101	1005	1265		
DS61X150X6	61.00	150.00	6.00		4.80	10.80	0.80	695.00	0.48	19662	0.96	37789	1.44	54611	1.92	70355	2.4	85251	2.88	99527		
DS71X150X6	71.00	150.00	6.00		4.80	10.80	0.80	646.00	199	285	419	556	662	813	926	1055	1213	1284	1521	1498		
DS71X150X8	71.00	150.00	8.00	7.50	4.50	12.00	0.56	861.00	0.8	9947	1.59	17623	2.39	23431	3.18	27770	3.98	31041	4.77	33645		
DS81X150X8	81.00	150.00	8.00	7.50	4.20	11.70	0.53	786.00	54	283	152	541	294	775	481	985	712	1171	988	1332		
DS81X150X10	81.00	150.00	10.00	9.30	3.70	13.00	0.37	983.00	0.72	12424	1.44	22824	2.16	31558	2.88	38983	3.6	45456	4.32	51334		
DS82X160X4.3	82.00	160.00	4.30		5.60	9.90	1.30	500.00	131	267	299	515	503	742	744	950	1020	1138	1333	1306		
DS82X160X6	82.00	160.00	6.00		4.50	10.50	0.75	698.00	0.72	13161	1.44	24179	2.16	33432	2.88	41298	3.6	48155	4.32	54382		
DS82X160X10	82.00	160.00	10.00	9.40	4.10	13.50	0.41	1164.00	121	299	279	577	473	832	704	1066	970	1277	1274	1466		
DS92X180X4.8	92.00	180.00	4.80		6.20	11.00	1.29	708.00	0.6	21981	1.2	41592	1.8	59198	2.4	75163	3	89851	3.6	103628		
DS92X180X6	92.00	180.00	6.00		4.60	14.00	0.46	1476.00	183	307	395	596	636	867	906	1121	1205	1357	1534	1575		
DS92X180X10	92.00	180.00	10.00	9.40	4.40	16.50	0.34	1918.00	0.555	21412	1.11	40756	1.665	58348	2.22	74501	2.775	89532	3.33	103754		
DS82X200X8	82.00	200.00	8.00	7.50	6.70	14.20	0.84	1641.00	178	316	383	614	612	895	868	1160	1150	1407	1457	1637		
DS82X200X10	82.00	200.00	10.00	9.40	6.10	15.50	0.61	2052.00	0.45	30598	0.9	59586	1.35	87189	1.8	113629	2.25	139128	2.7	163909		
DS82X200X12	82.00	200.00	12.00	11.25	5.35	16.60	0.45	2462.00	233	289	484	566	753	832	1039	1086	1342	1329	1663	1559		
DS92X200X10	92.00	200.00	10.00	9.40	6.20	15.60	0.62	1944.00	0.84	8058	1.68	13877	2.52	17850	3.36	20373	4.2	21843	5.04	22653		
									-18	304	8	580	78	828	192	1047	350	1238	553	1401		
									0.68	10873	1.35	20124	2.03	28040	2.7	34905	3.38	41008	5.05	46633		
									109	258	246	498	412	720	607	924	830	1109	1081	1276		
									0.525	30988	1.05	60029	1.575	87409	2.1	113414	2.625	138331	3.15	162444		
									228	286	475	558	743	818	1031	1065	1338	1299	1666	1521		
									0.93	9698	1.86	16718	2.79	21534	3.72	24618	4.65	26442	5.58	27479		
									-15	295	12	562	82	802	194	1015	350	1201	548	1360		
									0.77	10498	1.53	19145	2.3	26269	3.06	32196	3.83	37252	4.59	41764		
									77	241	183	464	317	669	481	856	673	1024	894	1174		
									0.6	28864	1.2	55504	1.8	80254	2.4	103447	3	125417	3.6	146498		
									189	266	400	520	630	760	881	987	1153	1201	1446	1402		
									0.525	51515	1.05	100753	1.575	148021	2.1	193628	2.625	237883	3.15	281094		
									258	280	532	549	822	808	1129	1056	1452	1294	1791	1521		
									0.93	22758	1.86	41253	2.79	56173	3.72	68204	4.65	78034	5.58	86350		
									85	282	207	542	369	782	568	1000	806	1198	1083	1374		
									0.825	32576	1.65	61189	2.475	86458	3.3	109003	4.125	129445	4.95	148403		
									172	273	374	530	607	770	870	992	1164	1198	1489	1387		
									0.69	41757	1.38	80456	2.07	116551	2.76	150494	3.45	182737	4.14	213734		
									228	246	479	481	751	703	1045	913	1361	1111	1699	1297		
									0.84	34868	1.68	65390	2.52	92246	3.36	116118	4.2	137688	5.04	157635		
									163	305	357	591	583	858	841	1106	1130	1336	1451	1547		



Disc Spring without Bearing Flats

Disc Spring with Bearing Flats



Product Code	Inner Dia. (Di) mm	Outer Dia. (De) mm	Thick. (t) mm	Reduced Thick. (t') mm	Cone Ht. (ho) mm	Overall Ht. (lo) mm	Cone Ht. To Thickness Ratio	Weight per 1000 pieces	15% Deflection		30% Deflection		45% Deflection		60% Deflection		75% Deflection		90% Deflection													
									Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N	Defl. mm	Force N												
									Stress		Stress		Stress		Stress		Stress		Stress													
		δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}	δ_{II}	δ_{III}											
DS92X200X12	92.00	200.00	12.00	11.25	5.55	16.80	0.46	2333.00	0.72	45959	1.44	88331	2.16	127650	2.88	164451	3.6	199269	4.32	232639	223	283	470	553	741	808	1035	1049	1354	1276	1696	1488
DS92X200X14	92.00	200.00	14.00	13.10	5.00	18.10	0.36	2722.00	0.615	58344	1.23	113839	1.845	166885	2.46	217881	3.075	267227	3.69	315322	261	262	540	513	836	754	1150	984	1481	1204	1830	1413
DS102X200X5.5	102.00	200.00	5.50		7.00	12.50	1.27	1004.00	1.05	13104	2.1	22637	3.15	29229	4.2	33510	5.25	36111	6.3	37662	-12	306	20	583	96	833	216	1054	381	1247	589	1412
DS102X200X8	102.00	200.00	8.00	7.50	6.10	13.60	0.76	1460.00	0.84	21220	1.68	38903	2.52	53614	3.36	65917	4.2	76378	5.04	85661	86	291	348	563	352	813	534	1044	747	1254	992	1443
DS102X200X10	102.00	200.00	10.00	9.40	6.20	15.60	0.62	1825.00	0.84	36810	1.26	69032	2.52	97384	3.36	122586	4.2	145357	5.04	166415	158	335	541	649	570	943	824	1216	1111	1468	1430	1700
DS102X200X12	102.00	200.00	12.00	11.25	4.95	16.20	0.41	2190.00	0.63	41077	1.26	19535	1.89	115757	2.52	150125	3.15	183020	3.78	214824	208	263	421	514	680	753	944	981	1227	1196	1528	1400
DS102X200X14	102.00	200.00	14.00	13.10	5.10	18.20	0.36	2555.00	0.63	63356	1.05	123500	1.89	180883	2.52	235959	3.15	289181	3.78	341001	261	296	469	581	839	854	1156	1114	1492	1363	1847	1600
DS112X200X12	112.00	200.00	12.00	11.10	5.10	16.20	0.43	2031.00	0.63	44382	0.84	85728	1.89	124466	2.52	161024	3.15	195830	3.78	229311	201	298	477	584	661	855	921	1113	1201	1358	1501	1589
DS112X200X14	112.00	200.00	14.00	12.90	4.60	17.50	0.33	2370.00	0.525	55407	1.05	108486	1.575	159538	2.1	208862	2.625	256758	3.15	303527	228	271	469	532	725	784	994	1026	1278	1259	1575	1483
DS112X200X16	112.00	200.00	16.00	14.80	4.00	18.80	0.25	2708.00	0.42	63667	0.84	125835	1.26	186679	1.68	246375	2.1	305100	2.52	363030	234	231	477	457	729	676	990	889	1260	1096	1539	1297
DS112X225X6.5	112.00	225.00	6.50	6.20	6.80	13.00	1.05	1526.00	0.975	13079	1.9	23081	2.925	30521	3.9	35914	4.875	39775	5.85	42618	14	242	61	463	140	664	251	845	394	1006	569	1147
DS112X225X8	112.00	225.00	8.00	7.50	7.00	14.50	0.88	1878.00	0.975	21136	1.9	38104	2.925	51580	3.9	62236	4.875	70749	5.85	77791	51	277	136	533	254	768	406	983	591	1176	810	1348
DS112X225X12	112.00	225.00	12.00	11.25	5.75	17.00	0.48	2817.00	0.75	39817	1.5	76333	2.25	110040	3	141437	3.75	171016	4.5	199275	176	253	372	493	589	721	826	935	1084	1137	1363	1326
DS102X250X10	102.00	250.00	10.00	9.40	8.60	18.00	0.86	3212.00	1.2	37336	2.4	67476	3.6	91587	4.8	110835	6	126387	7.2	139411	82	293	205	563	368	811	572	1037	817	1241	1102	1422
DS102X250X12	102.00	250.00	12.00	11.25	7.75	19.00	0.65	3854.00	1.05	47155	2.1	88047	3.15	123658	4.2	154969	5.25	182962	6.3	206618	155	273	342	529	560	767	811	987	1093	1190	1407	1376
DS127X250X7	127.00	250.00	7.00	6.70	8.10	14.80	1.16	2001.00	1.17	17689	2.34	30808	3.51	40130	4.68	46425	5.85	50466	7.02	53023	-7	271	24	518	92	741	197	940	340	1116	519	1268
DS127X250X10	127.00	250.00	10.00	9.40	7.60	17.00	0.76	2859.00	1.05	28005	2.1	51720	3.15	71833	4.2	89032	5.25	104004	6.3	117438	94	265	216	512	367	741	546	952	752	1146	987	1321
DS127X250X12	127.00	250.00	12.00	11.25	8.05	19.30	0.67	3431.00	1.195	55205	2.19	102670	3.285	143612	4.38	179251	5.475	210806	6.57	239494	139	345	313	668	522	968	766	1246	1045	1502	1369	1736
DS127X250X14	127.00	250.00	14.00	13.10	6.50	19.60	0.46	4003.00	0.84	57478	1.68	110428	2.52	159521	3.36	205431	4.2	248828	5.04	290385	190	271	401	529	633	773	886	1004	1160	1221	1455	1425
DS127X250X16	127.00	250.00	16.00	15.00	6.80	21.80	0.43	4574.00	0.87	86536	1.74	167252	2.61	243002	3.48	314639	4.35	383017	5.22	448990	241	311	504	609	789	891	1098	1160	1429	1414	1782	1663



1 Single Disc Spring



Total Force = Force of single disc spring

Total Deflection = Deflection of single disc spring

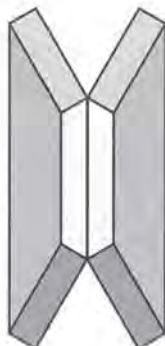
2 Disc Springs in Parallel



Total Force = 2 x Force of single disc spring

Total Deflection = Deflection of single disc spring

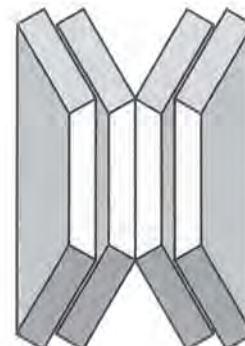
3 Disc Springs in Series



Total Force = Force of single disc spring

Total Deflection = 2 x Deflection of single disc spring

4 Disc Springs in Series and Parallel



Total Force = 2 x Force of single disc spring

Total Deflection = 2 x Deflection of single disc spring