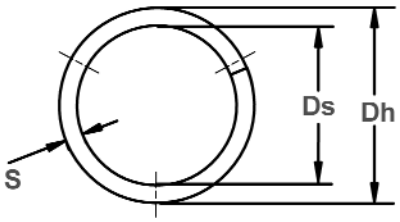
SST Wave Springs

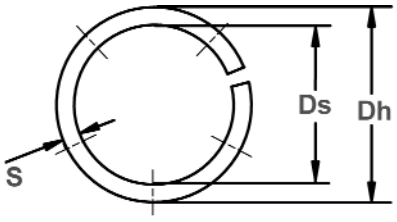
Single Turn, Inch

Ideal for short deflection applications with low to medium forces. Offered in a number of waves and material thicknesses. Designed for a wide range of bore and rod diameters.

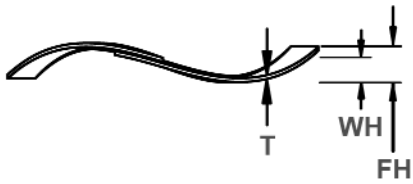
Wave Spring Measurements



Overlap: Sizes -50 to -162
3 Waves

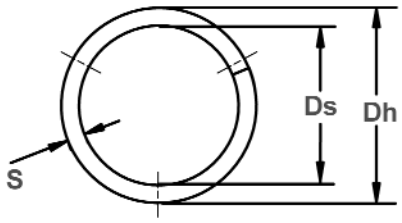


Gap: Sizes -175 & up
*Multiple Waves
(see table)

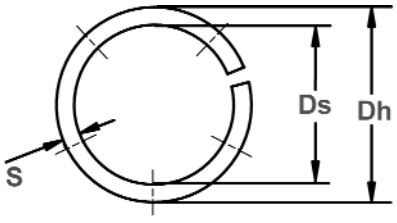


WAVE SPRING NO.	HOUSING DIAMETER	SHAFT DIAMETER CLEARANCE	LOAD (lb)	WORK HEIGHT	FREE HEIGHT Ref.	NO. OF WAVES*	THICKNESS	SECTION	SPRING RATE Ref.
	Dh	Ds		WH	FH		T	S	Lb/in.
SST-50	.500	.400	7	.050	.085	3	.008	.040	200
SST-62	.625	.480	10	.050	.095	3	.010	.058	222
SST-75	.750	.500	14	.062	.160	3	.010	.078	143
SST-87	.875	.620	16	.062	.130	3	.012	.094	235
SST-100	1.000	.780	18	.062	.160	3	.012	.094	184
SST-112	1.125	.840	20	.078	.130	3	.016	.133	385
SST-125	1.250	.960	22	.078	.150	3	.016	.133	306
SST-137	1.375	1.090	24	.078	.190	3	.016	.133	214
SST-150	1.500	1.170	26	.078	.170	3	.018	.143	283
SST-162	1.625	1.310	28	.078	.200	3	.018	.143	230
SST-175	1.750	1.440	30	.078	.140	4	.018	.143	484
SST-187	1.875	1.560	32	.078	.150	4	.018	.143	444
SST-200	2.000	1.680	34	.093	.140	4	.024	.150	723
SST-212	2.125	1.800	36	.093	.150	4	.024	.150	632
SST-225	2.250	1.930	38	.093	.170	4	.024	.150	494
SST-237	2.375	1.990	40	.093	.160	4	.024	.178	597
SST-250	2.500	2.120	42	.093	.170	4	.024	.178	545
SST-262	2.625	2.240	44	.093	.190	4	.024	.178	454
SST-275	2.750	2.340	46	.109	.170	4	.030	.188	754
SST-287	2.875	2.470	48	.109	.180	4	.030	.188	676
SST-300	3.000	2.590	50	.109	.190	4	.030	.188	617
SST-312	3.125	2.710	52	.109	.210	4	.030	.188	515
SST-325	3.250	2.750	54	.109	.200	4	.030	.233	593
SST-337	3.375	2.840	56	.109	.220	4	.030	.233	505
SST-350	3.500	3.000	58	.109	.230	4	.030	.233	479
SST-362	3.625	3.120	60	.109	.240	4	.030	.233	458
SST-375	3.750	3.250	62	.109	.260	4	.030	.233	411
SST-387	3.875	3.370	64	.109	.300	4	.030	.233	335
SST-400	4.000	3.500	66	.109	.190	5	.030	.233	815
SST-412	4.125	3.620	67	.109	.200	5	.030	.233	736
SST-425	4.250	3.740	69	.109	.210	5	.030	.233	683
SST-437	4.375	3.860	70	.109	.210	5	.030	.233	693
SST-450	4.500	3.990	72	.109	.230	5	.030	.233	595
SST-462	4.625	4.110	73	.125	.270	5	.030	.233	503
SST-475	4.750	4.240	75	.125	.310	5	.030	.233	405
SST-487	4.875	4.370	76	.125	.290	5	.030	.233	461

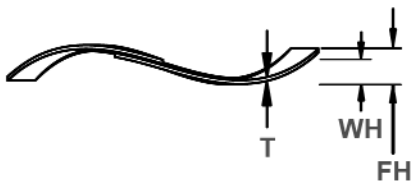
Wave Spring Measurements



Overlap: Sizes -50 to -162
3 Waves



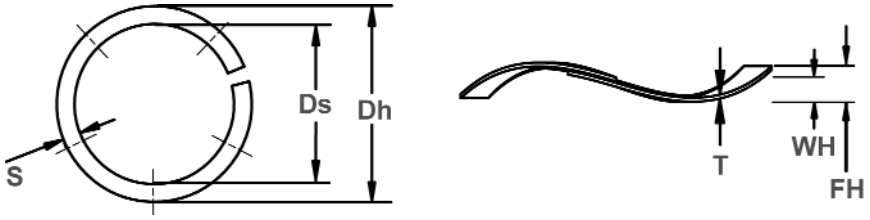
Gap: Sizes -175 & up
*Multiple Waves
(see table)



WAVE SPRING NO.	HOUSING DIAMETER	SHAFT DIAMETER CLEARANCE	LOAD (lb)	WORK HEIGHT	FREE HEIGHT Ref.	NO. OF WAVES*	THICKNESS	SECTION	SPRING RATE Ref.
	Dh	Ds		WH	FH		T	S	Lb/in.
SST-500	5.000	4.490	78	.125	.310	5	.030	.233	422
SST-512	5.125	4.610	80	.125	.340	5	.030	.233	372
SST-525	5.250	4.740	82	.125	.370	5	.030	.233	335
SST-537	5.375	4.860	84	.125	.380	5	.030	.233	329
SST-550	5.500	4.990	86	.125	.250	6	.030	.233	688
SST-562	5.625	5.110	88	.125	.270	6	.030	.233	607
SST-575	5.750	5.240	90	.125	.280	6	.030	.233	581
SST-587	5.875	5.360	92	.125	.300	6	.030	.233	526
SST-600	6.000	5.490	94	.125	.300	6	.030	.233	537
SST-612	6.125	5.610	96	.125	.310	6	.030	.233	519
SST-625	6.250	5.730	98	.125	.340	6	.030	.233	456
SST-637	6.375	5.860	100	.125	.350	6	.030	.233	444
SST-650	6.500	5.980	102	.125	.390	6	.030	.233	385
SST-675	6.750	6.230	104	.125	.420	6	.030	.233	353
SST-700	7.000	6.160	106	.156	.320	6	.032	.375	646
SST-725	7.250	6.440	108	.156	.350	6	.032	.375	557
SST-750	7.500	6.690	110	.156	.360	6	.032	.375	539
SST-775	7.750	6.940	114	.156	.380	6	.032	.375	509
SST-800	8.000	7.190	118	.156	.390	6	.032	.375	504
SST-825	8.250	7.440	122	.156	.430	6	.032	.375	445
SST-850	8.500	7.680	126	.156	.340	7	.032	.375	685
SST-875	8.750	7.930	130	.156	.340	7	.032	.375	707
SST-900	9.000	8.180	134	.156	.290	8	.032	.375	1,000
SST-950	9.500	8.680	142	.156	.240	9	.032	.375	1,690
SST-1000	10.000	9.170	150	.156	.290	9	.032	.375	1,119
SST-1050	10.500	9.670	158	.156	.310	9	.032	.375	1,026
SST-1100	11.000	10.170	166	.156	.350	9	.032	.375	856
SST-1150	11.500	10.660	174	.156	.360	9	.032	.375	853
SST-1200	12.000	11.160	182	.156	.440	9	.032	.375	641
SST-1250	12.500	11.660	190	.156	.350	10	.032	.375	979
SST-1300	13.000	12.160	198	.156	.410	10	.032	.375	780
SST-1350	13.500	12.650	206	.156	.430	10	.032	.375	752
SST-1400	14.000	13.150	214	.156	.300	12	.032	.375	1,486
SST-1450	14.500	13.650	221	.156	.320	12	.032	.375	1,348
SST-1500	15.000	14.130	230	.156	.350	12	.032	.375	1,186
SST-1550	15.500	14.640	239	.156	.310	13	.032	.375	1,552
SST-1600	16.000	15.140	248	.156	.340	13	.032	.375	1,348

NST Wave Springs

Wave Spring Measurements



Gap Type
*Multiple Waves
(see table)

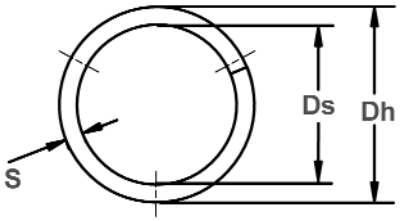
WAVE SPRING NO.	HOUSING DIAMETER	SHAFT DIAMETER CLEARANCE	LOAD (lb)	WORK HEIGHT	FREE HEIGHT Ref.	NO. OF WAVES*	THICKNESS	SECTION	SPRING RATE Ref.
	Dh	Ds		WH	FH		T	S	Lb/in.
NST-325	3.250	2.820	54	.109	.200	4	.03	.188	593
NST-337	3.375	2.940	56	.109	.220	4	.03	.188	505
NST-350	3.500	3.070	58	.109	.260	4	.03	.188	384
NST-362	3.625	3.190	60	.109	.270	4	.03	.188	373
NST-375	3.750	3.320	62	.109	.280	4	.03	.188	363
NST-387	3.875	3.440	64	.109	.310	4	.03	.188	318
NST-400	4.000	3.570	66	.109	.200	5	.03	.188	725
NST-412	4.125	3.690	67	.109	.200	5	.03	.188	736
NST-425	4.250	3.820	69	.109	.240	5	.03	.188	527
NST-437	4.375	3.940	70	.109	.210	5	.03	.188	693
NST-450	4.500	4.070	72	.109	.280	5	.03	.188	421
NST-462	4.625	4.190	73	.125	.270	5	.03	.188	503
NST-475	4.750	4.320	75	.125	.320	5	.03	.188	385
NST-487	4.875	4.440	76	.125	.320	5	.03	.188	390
NST-500	5.000	4.570	78	.125	.350	5	.03	.188	347
NST-512	5.125	4.690	80	.125	.350	5	.03	.188	356
NST-525	5.250	4.820	82	.125	.360	5	.03	.188	349
NST-537	5.375	4.940	84	.125	.440	5	.03	.188	267
NST-550	5.500	5.070	86	.125	.280	6	.03	.188	555
NST-562	5.625	5.190	88	.125	.290	6	.03	.188	533
NST-575	5.750	5.320	90	.125	.340	6	.03	.188	419
NST-587	5.875	5.440	92	.125	.340	6	.03	.188	428
NST-600	6.000	5.570	94	.125	.340	6	.03	.188	437
NST-612	6.125	5.690	96	.125	.280	7	.03	.188	619
NST-625	6.250	5.820	98	.125	.280	7	.03	.188	632
NST-637	6.375	5.940	100	.125	.300	7	.03	.188	571
NST-650	6.500	6.070	102	.125	.300	7	.03	.188	583
NST-675	6.750	6.320	104	.125	.300	7	.03	.188	594
NST-700	7.000	6.480	106	.156	.320	7	.03	.233	646
NST-725	7.250	6.730	108	.156	.330	7	.03	.233	621
NST-750	7.500	6.980	110	.156	.360	7	.03	.233	539
NST-775	7.750	7.230	114	.156	.380	7	.03	.233	509

Single Turn, Metric

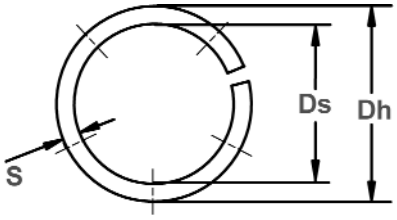
Ideal for short deflection applications with low to medium forces. Offered in a number of waves and material thicknesses. Designed for a wide range of bore and rod diameters.

MST Wave Springs

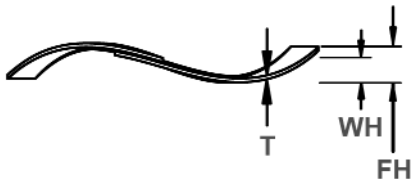
Wave Spring Measurements



Overlap: Sizes -63 to -374
*Multiple Waves
(see table)



Gap: Sizes -394 & up
*Multiple Waves
(see table)



WAVE SPRING NO.	HOUSING DIAMETER	SHAFT DIAMETER CLEARANCE	LOAD (N)	WORK HEIGHT	FREE HEIGHT Ref.	NO. OF WAVES*	THICKNESS	SECTION	SPRING RATE Ref.
	Dh	Ds		WH	FH		T	S	N/mm
MST-63	16.0	11.28	44.5	1.57	2.29	3	.25	1.98	65
MST-75	19.0	14.28	53.4	1.57	3.05	3	.25	1.98	35
MST-87	22.0	16.46	62.3	1.57	2.79	3	.30	2.39	48
MST-95	24.0	18.46	66.7	1.57	3.56	3	.30	2.39	35
MST-102	26.0	18.22	71.2	1.98	2.54	3	.41	3.38	111
MST-110	28.0	20.22	75.6	1.98	2.79	3	.41	3.38	85
MST-118	30.0	22.22	84.5	1.98	3.30	3	.41	3.38	66
MST-126	32.0	24.22	89.0	1.98	3.81	3	.41	3.38	52
MST-138	35.0	27.22	97.9	1.98	4.57	3	.41	3.38	38
MST-146	37.0	28.72	102.3	1.98	3.81	3	.46	3.63	58
MST-158	40.0	31.72	111.2	1.98	5.08	3	.46	3.63	37
MST-165	42.0	33.72	115.7	1.98	3.05	4	.46	3.63	99
MST-185	47.0	38.72	129.0	1.98	3.81	4	.46	3.63	68
MST-205	52.0	43.11	142.4	2.36	3.56	4	.61	3.81	121
MST-217	55.0	46.11	151.3	2.36	3.81	4	.61	3.81	100
MST-244	62.0	51.69	169.1	2.36	4.32	4	.61	4.52	85
MST-268	68.0	57.17	186.9	2.77	4.32	4	.76	4.78	131
MST-276	70.0	59.17	191.3	2.77	4.32	4	.76	4.78	119
MST-284	72.0	61.17	195.8	2.77	4.57	4	.76	4.78	108
MST-295	75.0	64.17	204.7	2.77	5.08	4	.76	4.78	94
MST-315	80.0	68.66	218.0	2.77	5.59	4	.76	4.78	76
MST-335	85.0	71.38	231.4	2.77	5.59	4	.76	5.92	83
MST-354	90.0	76.38	249.2	2.77	6.35	4	.76	5.92	68
MST-374	95.0	81.38	262.5	2.77	7.37	4	.76	5.92	57
MST-394	100.0	86.38	275.9	2.77	4.57	5	.76	5.92	157
MST-413	105.0	91.38	289.2	2.77	5.08	5	.76	5.92	134
MST-433	110.0	96.38	302.6	2.77	5.33	5	.76	5.92	115
MST-453	115.0	101.38	315.9	3.18	6.35	5	.76	5.92	99
MST-472	120.0	106.38	329.3	3.18	7.11	5	.76	5.92	86
MST-492	125.0	111.38	342.6	3.18	7.62	5	.76	5.92	76
MST-512	130.0	116.38	356.0	3.18	8.64	5	.76	5.92	67
MST-532	135.0	121.38	369.3	3.18	9.40	5	.76	5.92	59
MST-551	140.0	126.38	382.7	3.18	6.86	6	.76	5.92	108
MST-571	145.0	131.38	396.0	3.18	7.37	6	.76	5.92	97
MST-591	150.0	136.38	404.9	3.18	7.87	6	.76	5.92	87
MST-630	160.0	146.38	440.5	3.18	9.40	6	.76	5.92	71
MST-650	165.0	151.38	453.9	3.18	10.41	6	.76	5.92	64
MST-669	170.0	156.38	467.2	3.18	11.18	6	.76	5.92	58

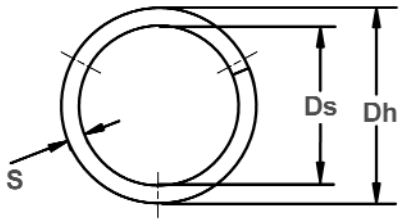
ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED.

MST Wave Springs

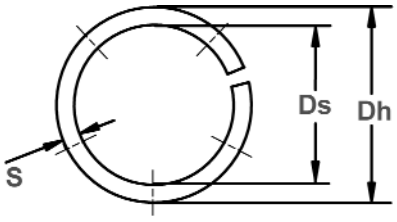
Single Turn, Metric

Ideal for short deflection applications with low to medium forces. Offered in a number of waves and material thicknesses. Designed for a wide range of bore and rod diameters.

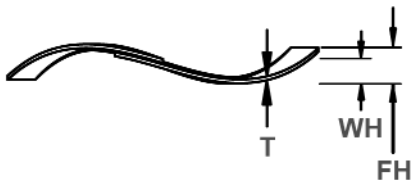
Wave Spring Measurements



Overlap: Sizes -63 to -374
*Multiple Waves
(see table)



Gap: Sizes -394 & up
*Multiple Waves
(see table)



WAVE SPRING NO.	HOUSING DIAMETER	SHAFT DIAMETER CLEARANCE	LOAD (N)	WORK HEIGHT	FREE HEIGHT Ref.	NO. OF WAVES*	THICKNESS	SECTION	SPRING RATE Ref.
	Dh	Ds		WH	FH		T	S	N/mm
MST-689	175.0	154.16	480.6	3.96	8.13	6	.81	9.53	116
MST-709	180.0	159.16	493.9	3.96	8.64	6	.81	9.53	105
MST-728	185.0	164.16	507.3	3.96	9.14	6	.81	9.53	97
MST-748	190.0	169.16	520.6	3.96	9.91	6	.81	9.53	88
MST-787	200.0	179.16	547.3	3.96	7.11	7	.81	9.53	174
MST-807	205.0	184.16	560.7	3.96	7.37	7	.81	9.53	161
MST-827	210.0	189.16	578.5	3.96	7.87	7	.81	9.53	149
MST-847	215.0	194.16	591.8	3.96	8.38	7	.81	9.53	138
MST-866	220.0	199.16	605.2	3.96	8.64	7	.81	9.53	128
MST-886	225.0	204.16	618.5	3.96	7.11	8	.81	9.53	203
MST-906	230.0	209.16	631.9	3.96	6.10	9	.81	9.53	303
MST-925	235.0	214.16	645.2	3.96	6.35	9	.81	9.53	283
MST-945	240.0	219.16	658.6	3.96	6.35	9	.81	9.53	265
MST-984	250.0	229.16	685.3	3.96	6.86	9	.81	9.53	232
MST-1024	260.0	239.16	712.0	3.96	7.37	9	.81	9.53	205
MST-1043	265.0	244.16	725.3	3.96	7.62	9	.81	9.53	193
MST-1063	270.0	249.16	743.1	3.96	8.13	9	.81	9.53	182
MST-1102	280.0	259.16	769.8	3.96	8.64	9	.81	9.53	162
MST-1142	290.0	269.16	796.5	3.96	9.40	9	.81	9.53	144
MST-1181	300.0	279.16	823.2	3.96	10.41	9	.81	9.53	129
MST-1221	310.0	289.16	849.9	3.96	7.11	9	1.07	9.53	264
MST-1260	320.0	299.16	876.6	3.96	7.62	9	1.07	9.53	239
MST-1339	340.0	319.16	934.5	3.96	8.64	9	1.07	9.53	198
MST-1378	350.0	329.16	961.1	3.96	9.40	9	1.07	9.53	180
MST-1417	360.0	339.16	987.9	3.96	7.62	10	1.07	9.53	271
MST-1457	370.0	349.16	1014.6	3.96	8.13	10	1.07	9.53	249
MST-1496	380.0	359.16	1041.3	3.96	8.64	10	1.07	9.53	229
MST-1535	390.0	369.16	1072.4	3.96	9.14	10	1.07	9.53	211
MST-1575	400.0	379.16	1099.1	3.96	9.65	10	1.07	9.53	196
MST-1614	410.0	382.82	1125.8	3.96	8.38	10	1.07	12.70	251
MST-1654	420.0	392.82	1152.5	3.96	8.89	10	1.07	12.70	233
MST-1693	430.0	402.82	1179.2	3.96	7.62	11	1.07	12.70	317
MST-1732	440.0	412.82	1205.9	3.96	8.13	11	1.07	12.70	295
MST-1811	460.0	432.82	1263.7	3.96	8.89	11	1.07	12.70	256
MST-1890	480.0	452.82	1317.1	3.96	8.13	12	1.07	12.70	318
MST-1969	500.0	472.82	1370.5	3.96	8.89	12	1.07	12.70	280
MST-2126	540.0	512.82	1481.8	3.96	8.89	13	1.07	12.70	303
MST-2284	580.0	552.82	1593.0	3.96	8.89	14	1.07	12.70	327

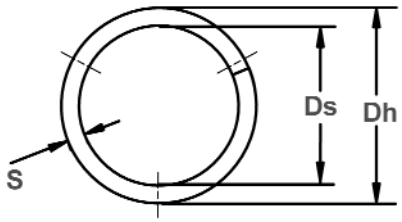
ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE STATED.

Bearing Interchange Chart

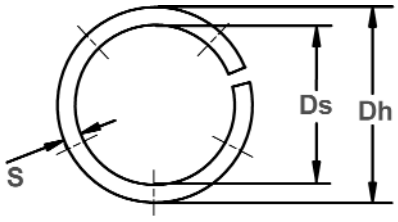
This chart pairs metric single turn wave springs with the appropriate standard bearing number.

TRU WAVE™

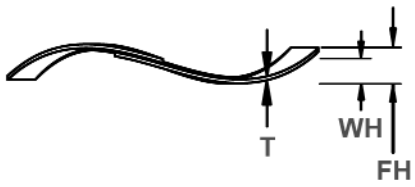
Wave Spring Measurements



Overlap: Sizes -63 to -374
*Multiple Waves
(see table)



Gap: Sizes -394 & up
*Multiple Waves
(see table)



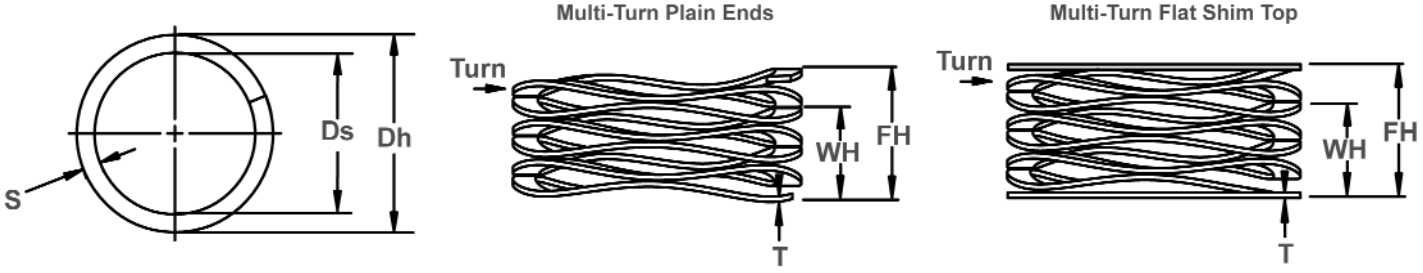
WAVE SPRING NO.	BEARING O.D. (mm)	BEARING NUMBERS						
		EXTRA SMALL	EXTREMELY LIGHT	EXTRA LIGHT	NAR-ROW	LIGHT	MED-IUM	HEAVY
MST-63	16	34	-	-	-	-	-	-
MST-75	19	35,36	-	-	-	-	-	-
MST-87	22	37,38	00	-	-	-	-	-
MST-95	24	38KV	01	-	-	-	-	-
MST-102	26	39	-	100	-	-	-	-
MST-110	28	-	02	101	-	-	-	-
MST-118	30	-	03	-	-	200	-	-
MST-126	32	-	-	102	02	201	-	-
MST-138	35	-	-	103	-	202	300	-
MST-146	37	-	04	-	03	-	301	-
MST-158	40	-	-	-	-	203	-	-
MST-165	42	-	05	104	04	-	302	-
MST-185	47	-	06	105	-	204	303	-
MST-205	52	-	-	-	05	205	304	-
MST-217	55	-	07	106	-	-	-	-
MST-244	62	-	08	107	06	206	305	403
MST-268	68	-	09	108	-	-	-	-
MST-276	70	-	-	-	07	-	-	-
MST-284	72	-	10	-	-	207	306	404
MST-295	75	-	-	109	-	-	-	-
MST-315	80	-	11	110	08	208	307	405
MST-335	85	-	12	-	09	209	-	-
MST-354	90	-	13	111	10	210	308	406
MST-374	95	-	-	112	-	-	-	-
MST-394	100	-	14	113	11	211	309	407
MST-413	105	-	15	-	12	-	-	-
MST-433	110	-	16	114	-	212	310	408
MST-453	115	-	-	115	13	-	-	-
MST-472	120	-	17	-	14	213	311	409
MST-492	125	-	18	116	-	214	-	-
MST-512	130	-	19	117	15	215	312	410
MST-532	135	-	-	-	16	-	-	-
MST-551	140	-	20	118	-	216	313	411
MST-571	145	-	21	119	17	-	-	-
MST-591	150	-	22	120	18	217	314	412
MST-630	160	-	-	121	19	218	315	413
MST-650	165	-	24	-	20	-	-	-
MST-669	170	-	-	122	-	219	316	-

WAVE SPRING NO.	BEARING O.D. (mm)	BEARING NUMBERS						
		EXTRA SMALL	EXTREMELY LIGHT	EXTRA LIGHT	NAR-ROW	LIGHT	MED-IUM	HEAVY
MST-689	175	-	-	-	22	-	-	-
MST-709	180	-	26	124	21	220	317	414
MST-728	185	-	-	-	22	-	-	-
MST-748	190	-	28	-	24	221	318	415
MST-787	200	-	-	126	-	222	319	416
MST-807	205	-	-	-	26	-	-	-
MST-827	210	-	30	128	-	-	-	417
MST-847	215	-	-	-	-	224	320	-
MST-866	220	-	32	-	28	-	-	-
MST-886	225	-	-	130	-	-	321	418
MST-906	230	-	34	-	-	226	-	-
MST-925	235	-	-	-	30	-	-	-
MST-945	240	-	-	132	-	-	322	-
MST-984	250	-	36	-	32	228	-	419
MST-1024	260	-	38	134	-	-	324	-
MST-1043	265	-	-	-	34	-	-	420
MST-1063	270	-	-	-	-	230	-	-
MST-1102	280	-	40	136	36	-	326	-
MST-1142	290	-	-	138	-	232	-	421
MST-1181	300	-	-	-	38	-	328	-
MST-1221	310	-	-	140	-	234	-	-
MST-1260	320	-	-	-	40	236	330	422
MST-1339	340	-	-	144	42	238	332	-
MST-1378	350	-	-	-	44	-	-	-
MST-1417	360	-	-	148	-	240	334	-
MST-1457	370	-	-	-	46	-	-	-
MST-1496	380	-	-	-	-	-	336	-
MST-1535	390	-	-	-	48	-	-	-
MST-1575	400	-	-	152	-	244	338	-
MST-1614	410	-	-	-	50	-	-	-
MST-1654	420	-	-	156	-	-	340	-
MST-1693	430	-	-	-	52	-	-	-
MST-1732	440	-	-	-	-	248	342	-
MST-1811	460	-	-	160	56	-	344	-
MST-1890	480	-	-	164	-	252	-	-
MST-1969	500	-	-	-	64	256	348	-
MST-2126	540	-	-	-	-	260	352	-
MST-2284	580	-		-	-	264	356	-

WSL,WSM, WSR Wave Springs

Multi Turn, Inch

Used for low force applications with large deflections: More turns equals less force. Utilizes nearly half the space as helical compression springs while producing the same force.

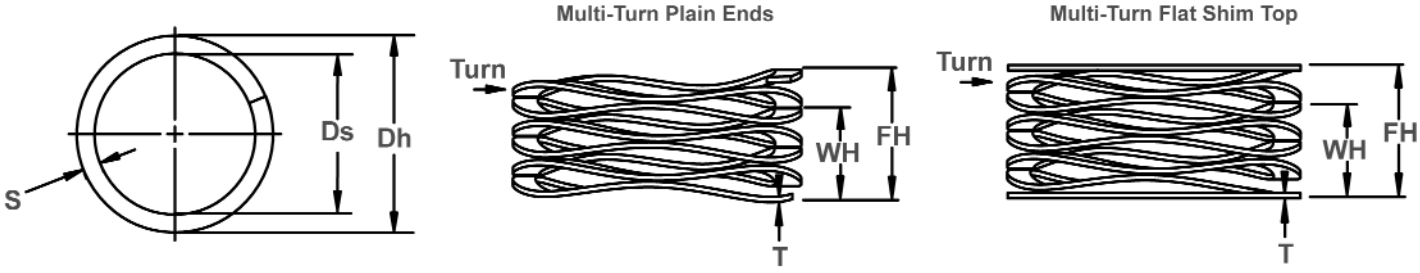


Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER			SHAFT DIAMETER CLEARANCE	LOAD (lbs.)	WORK HEIGHT	FREE HEIGHT Ref.	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS	SECTION	SPRING RATE Ref. Lb/in.
	Dh DEC	Dh FRAC	Dh mm	Ds		WH	FH			T	S	
WSL-37 A	.375	3/8	9.5	.250	4	.062	.150	2.5	3	.008	.032	45
WSL-37 B	.375	3/8	9.5	.250	4	.098	.200	2.5	4	.008	.032	39
WSL-37 C	.375	3/8	9.5	.250	4	.108	.250	2.5	5	.008	.032	28
WSL-37 D	.375	3/8	9.5	.250	4	.135	.300	2.5	6	.008	.032	24
WSL-37 E	.375	3/8	9.5	.250	4	.150	.350	2.5	7	.008	.032	20
WSL-37 F	.375	3/8	9.5	.250	4	.184	.400	2.5	8	.008	.032	19
WSL-37 G	.375	3/8	9.5	.250	4	.195	.450	2.5	9	.008	.032	16
WSL-37 H	.375	3/8	9.5	.250	4	.228	.500	2.5	10	.008	.032	15
WSL-37 I	.375	3/8	9.5	.250	4	.240	.550	2.5	11	.008	.032	13
WSM-37 A	.375	3/8	9.5	.250	7	.081	.150	2.5	3	.011	.032	101
WSM-37 B	.375	3/8	9.5	.250	7	.119	.200	2.5	4	.011	.032	86
WSM-37 C	.375	3/8	9.5	.250	7	.145	.250	2.5	5	.011	.032	67
WSM-37 D	.375	3/8	9.5	.250	7	.180	.300	2.5	6	.011	.032	58
WSM-37 E	.375	3/8	9.5	.250	7	.202	.350	2.5	7	.011	.032	47
WSM-37 F	.375	3/8	9.5	.250	7	.240	.400	2.5	8	.011	.032	44
WSM-37 G	.375	3/8	9.5	.250	7	.262	.450	2.5	9	.011	.032	37
WSM-37 H	.375	3/8	9.5	.250	7	.298	.500	2.5	10	.011	.032	35
WSM-37 I	.375	3/8	9.5	.250	7	.327	.550	2.5	11	.011	.032	31
WSL-43 A	.437	7/16	11.1	.281	4	.063	.165	2.5	3	.008	.040	39
WSL-43 B	.437	7/16	11.1	.281	4	.093	.220	2.5	4	.008	.040	31
WSL-43 C	.437	7/16	11.1	.281	4	.109	.275	2.5	5	.008	.040	24
WSL-43 D	.437	7/16	11.1	.281	4	.143	.330	2.5	6	.008	.040	21
WSL-43 E	.437	7/16	11.1	.281	4	.160	.385	2.5	7	.008	.040	18
WSL-43 F	.437	7/16	11.1	.281	4	.195	.440	2.5	8	.008	.040	16
WSL-43 G	.437	7/16	11.1	.281	4	.210	.495	2.5	9	.008	.040	14
WSL-43 H	.437	7/16	11.1	.281	4	.240	.550	2.5	10	.008	.040	13
WSL-43 I	.437	7/16	11.1	.281	4	.260	.605	2.5	11	.008	.040	12
WSM-43 A	.437	7/16	11.1	.281	8	.082	.165	2.5	3	.011	.046	96
WSM-43 B	.437	7/16	11.1	.281	8	.115	.220	2.5	4	.011	.046	76
WSM-43 C	.437	7/16	11.1	.281	8	.142	.275	2.5	5	.011	.046	60
WSM-43 D	.437	7/16	11.1	.281	8	.179	.330	2.5	6	.011	.046	53
WSM-43 E	.437	7/16	11.1	.281	8	.198	.385	2.5	7	.011	.046	43
WSM-43 F	.437	7/16	11.1	.281	8	.231	.440	2.5	8	.011	.046	38
WSM-43 G	.437	7/16	11.1	.281	8	.255	.495	2.5	9	.011	.046	33
WSM-43 H	.437	7/16	11.1	.281	8	.290	.550	2.5	10	.011	.046	31
WSM-43 I	.437	7/16	11.1	.281	8	.319	.605	2.5	11	.011	.046	28

PART NUMBERS SHOWN REFLECT MULTI-TURN WAVE SPRINGS WITH PLAIN ENDS.
THE LETTERS SHOWN AFTER THE PART NUMBERS REPRESENT THE NUMBER OF TURNS. WHEN ORDERING, PARTS SHOULD BE PRESENTED WITH THE PART NUMBER, FOLLOWED BY THE MATERIAL, AND THEN THE NUMBER OF TURNS (i.e. WSL-37ST A, WSM-50ST B, WSR-75ST C, ETC.)
FOR FLAT SHIM TOP WAVE SPRINGS, ADD AN 'F' TO THE END OF THE PART NUMBER (i.e. WSL-37ST AF, WSM-50ST BF, WSR-75ST CF, ETC.)

MATERIAL CODES: ST = CARBON STEEL. SQ = 17-7 PH/C STAINLESS STEEL. SPECIAL ALLOYS AVAILABLE UPON REQUEST.



Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER			SHAFT DIAMETER CLEARANCE	LOAD (lbs.)	WORK HEIGHT	FREE HEIGHT Ref.	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS	SECTION	SPRING RATE Ref. Lb/in.
	Dh DEC	Dh FRAC	Dh mm	Ds		WH	FH			T	S	
WSL-50 A	.500	1/2	12.7	.312	5	.062	.180	2.5	3	.008	.056	42
WSL-50 B	.500	1/2	12.7	.312	5	.090	.240	2.5	4	.008	.056	33
WSL-50 C	.500	1/2	12.7	.312	5	.107	.300	2.5	5	.008	.056	26
WSL-50 D	.500	1/2	12.7	.312	5	.136	.360	2.5	6	.008	.056	22
WSL-50 E	.500	1/2	12.7	.312	5	.150	.420	2.5	7	.008	.056	19
WSL-50 F	.500	1/2	12.7	.312	5	.180	.480	2.5	8	.008	.056	17
WSL-50 G	.500	1/2	12.7	.312	5	.195	.540	2.5	9	.008	.056	14
WSL-50 H	.500	1/2	12.7	.312	5	.220	.600	2.5	10	.008	.056	13
WSL-50 I	.500	1/2	12.7	.312	5	.240	.660	2.5	11	.008	.056	12
WSM-50 A	.500	1/2	12.7	.312	10	.065	.180	2.5	3	.010	.058	87
WSM-50 B	.500	1/2	12.7	.312	10	.092	.240	2.5	4	.010	.058	68
WSM-50 C	.500	1/2	12.7	.312	10	.114	.300	2.5	5	.010	.058	54
WSM-50 D	.500	1/2	12.7	.312	10	.147	.360	2.5	6	.010	.058	47
WSM-50 E	.500	1/2	12.7	.312	10	.162	.420	2.5	7	.010	.058	39
WSM-50 F	.500	1/2	12.7	.312	10	.196	.480	2.5	8	.010	.058	35
WSM-50 G	.500	1/2	12.7	.312	10	.207	.540	2.5	9	.010	.058	30
WSM-50 H	.500	1/2	12.7	.312	10	.246	.600	2.5	10	.010	.058	28
WSM-50 I	.500	1/2	12.7	.312	10	.264	.660	2.5	11	.010	.058	25
WSL-56 A	.562	9/16	14.3	.375	5	.080	.195	2.5	3	.009	.058	43
WSL-56 B	.562	9/16	14.3	.375	5	.125	.260	2.5	4	.009	.058	37
WSL-56 C	.562	9/16	14.3	.375	5	.135	.325	2.5	5	.009	.058	26
WSL-56 D	.562	9/16	14.3	.375	5	.180	.390	2.5	6	.009	.058	24
WSL-56 E	.562	9/16	14.3	.375	5	.190	.455	2.5	7	.009	.058	19
WSL-56 F	.562	9/16	14.3	.375	5	.230	.520	2.5	8	.009	.058	17
WSL-56 G	.562	9/16	14.3	.375	5	.260	.585	2.5	9	.009	.058	15
WSL-56 H	.562	9/16	14.3	.375	5	.285	.650	2.5	10	.009	.058	14
WSL-56 I	.562	9/16	14.3	.375	5	.315	.715	2.5	11	.009	.058	13
WSM-56 A	.562	9/16	14.3	.375	11	.086	.195	2.5	3	.012	.060	101
WSM-56 B	.562	9/16	14.3	.375	11	.123	.260	2.5	4	.012	.060	80
WSM-56 C	.562	9/16	14.3	.375	11	.145	.325	2.5	5	.012	.060	61
WSM-56 D	.562	9/16	14.3	.375	11	.187	.390	2.5	6	.012	.060	54
WSM-56 E	.562	9/16	14.3	.375	11	.209	.455	2.5	7	.012	.060	45
WSM-56 F	.562	9/16	14.3	.375	11	.253	.520	2.5	8	.012	.060	41
WSM-56 G	.562	9/16	14.3	.375	11	.273	.585	2.5	9	.012	.060	35
WSM-56 H	.562	9/16	14.3	.375	11	.318	.650	2.5	10	.012	.060	33
WSM-56 I	.562	9/16	14.3	.375	11	.343	.715	2.5	11	.012	.060	30

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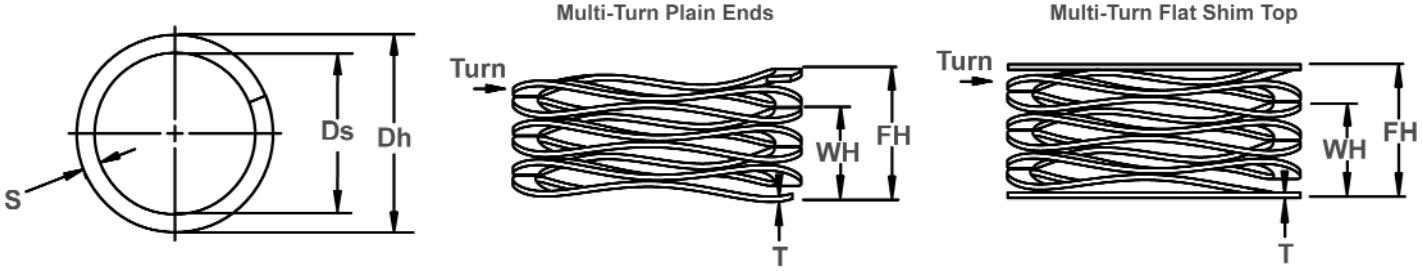

Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER			SHAFT DIAMETER CLEARANCE	LOAD (lbs.)	WORK HEIGHT	FREE HEIGHT Ref.	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS	SECTION	SPRING RATE Ref. Lb/in.
	Dh DEC	Dh FRAC	Dh mm	Ds		WH	FH			T	S	
WSL-62 A	.625	5/8	15.9	.450	6	.055	.180	2.5	3	.010	.058	48
WSL-62 B	.625	5/8	15.9	.450	6	.068	.240	2.5	4	.010	.058	35
WSL-62 C	.625	5/8	15.9	.450	6	.085	.300	2.5	5	.010	.058	28
WSL-62 D	.625	5/8	15.9	.450	6	.106	.360	2.5	6	.010	.058	24
WSL-62 E	.625	5/8	15.9	.450	6	.128	.420	2.5	7	.010	.058	21
WSL-62 F	.625	5/8	15.9	.450	6	.165	.540	2.5	9	.010	.058	16
WSL-62 G	.625	5/8	15.9	.450	6	.202	.660	2.5	11	.010	.058	13
WSL-62 H	.625	5/8	15.9	.450	6	.238	.780	2.5	13	.010	.058	11
WSM-62 A	.625	5/8	15.9	.450	12	.104	.180	3.5	3	.010	.058	158
WSM-62 B	.625	5/8	15.9	.450	12	.130	.240	3.5	4	.010	.058	109
WSM-62 C	.625	5/8	15.9	.450	12	.175	.300	3.5	5	.010	.058	96
WSM-62 D	.625	5/8	15.9	.450	12	.206	.360	3.5	6	.010	.058	78
WSM-62 E	.625	5/8	15.9	.450	12	.246	.420	3.5	7	.010	.058	69
WSM-62 F	.625	5/8	15.9	.450	12	.317	.540	3.5	9	.010	.058	54
WSM-62 G	.625	5/8	15.9	.450	12	.386	.660	3.5	11	.010	.058	44
WSM-62 H	.625	5/8	15.9	.450	12	.454	.780	3.5	13	.010	.058	37
WSL-75 A	.750	3/4	19.0	.550	7	.142	.250	3.5	3	.008	.071	65
WSL-75 B	.750	3/4	19.0	.550	7	.187	.333	3.5	4	.008	.071	48
WSL-75 C	.750	3/4	19.0	.550	7	.246	.417	3.5	5	.008	.071	41
WSL-75 D	.750	3/4	19.0	.550	7	.285	.500	3.5	6	.008	.071	33
WSL-75 E	.750	3/4	19.0	.550	7	.348	.583	3.5	7	.008	.071	30
WSL-75 F	.750	3/4	19.0	.550	7	.446	.750	3.5	9	.008	.071	23
WSL-75 G	.750	3/4	19.0	.550	7	.580	1.000	3.5	12	.008	.071	17
WSM-75 A	.750	3/4	19.0	.550	13	.159	.250	3.5	3	.010	.078	143
WSM-75 B	.750	3/4	19.0	.550	13	.203	.333	3.5	4	.010	.078	100
WSM-75 C	.750	3/4	19.0	.550	13	.270	.417	3.5	5	.010	.078	88
WSM-75 D	.750	3/4	19.0	.550	13	.314	.500	3.5	6	.010	.078	70
WSM-75 E	.750	3/4	19.0	.550	13	.381	.583	3.5	7	.010	.078	64
WSM-75 F	.750	3/4	19.0	.550	13	.489	.750	3.5	9	.010	.078	50
WSM-75 G	.750	3/4	19.0	.550	13	.649	1.000	3.5	12	.010	.078	37
WSR-75 A	.750	3/4	19.0	.550	22	.169	.250	3.5	3	.013	.079	272
WSR-75 B	.750	3/4	19.0	.550	22	.215	.333	3.5	4	.013	.079	186
WSR-75 C	.750	3/4	19.0	.550	22	.291	.417	3.5	5	.013	.079	175
WSR-75 D	.750	3/4	19.0	.550	22	.335	.500	3.5	6	.013	.079	133
WSR-75 E	.750	3/4	19.0	.550	22	.405	.583	3.5	7	.013	.079	124
WSR-75 F	.750	3/4	19.0	.550	22	.526	.750	3.5	9	.013	.079	98
WSR-75 G	.750	3/4	19.0	.550	22	.699	1.000	3.5	12	.013	.079	73

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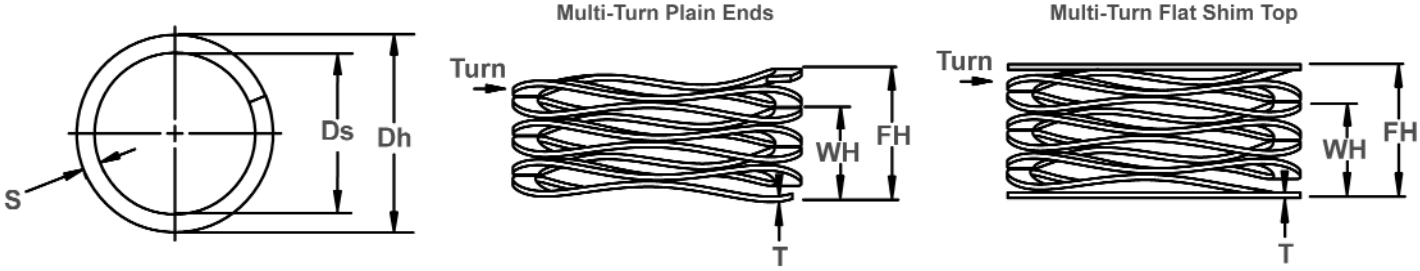

Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER			SHAFT DIAMETER CLEARANCE	LOAD (lbs.)	WORK HEIGHT	FREE HEIGHT Ref.	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS	SECTION	SPRING RATE Ref. Lb/in.
	Dh DEC	Dh FRAC	Dh mm	Ds		WH	FH			T	S	
WSL-87 A	.875	7/8	22.2	.600	12	.117	.250	3.5	3	.010	.086	90
WSL-87 B	.875	7/8	22.2	.600	12	.158	.333	3.5	4	.010	.086	69
WSL-87 C	.875	7/8	22.2	.600	12	.207	.417	3.5	5	.010	.086	57
WSL-87 D	.875	7/8	22.2	.600	12	.242	.500	3.5	6	.010	.086	47
WSL-87 E	.875	7/8	22.2	.600	12	.287	.583	3.5	7	.010	.086	41
WSL-87 F	.875	7/8	22.2	.600	12	.378	.750	3.5	9	.010	.086	32
WSL-87 G	.875	7/8	22.2	.600	12	.498	1.000	3.5	12	.010	.086	24
WSM-87 A	.875	7/8	22.2	.600	18	.124	.250	3.5	3	.012	.094	148
WSM-87 B	.875	7/8	22.2	.600	18	.164	.333	3.5	4	.012	.094	108
WSM-87 C	.875	7/8	22.2	.600	18	.214	.417	3.5	5	.012	.094	89
WSM-87 D	.875	7/8	22.2	.600	18	.252	.500	3.5	6	.012	.094	76
WSM-87 E	.875	7/8	22.2	.600	18	.296	.583	3.5	7	.012	.094	66
WSM-87 F	.875	7/8	22.2	.600	18	.385	.750	3.5	9	.012	.094	50
WSM-87 G	.875	7/8	22.2	.600	18	.509	1.000	3.5	12	.012	.094	38
WSR-87 A	.875	7/8	22.2	.600	25	.166	.250	3.5	3	.015	.094	298
WSR-87 B	.875	7/8	22.2	.600	25	.214	.333	3.5	4	.015	.094	210
WSR-87 C	.875	7/8	22.2	.600	25	.278	.417	3.5	5	.015	.094	180
WSR-87 D	.875	7/8	22.2	.600	25	.327	.500	3.5	6	.015	.094	145
WSR-87 E	.875	7/8	22.2	.600	25	.395	.583	3.5	7	.015	.094	133
WSR-87 F	.875	7/8	22.2	.600	25	.510	.750	3.5	9	.015	.094	104
WSR-87 G	.875	7/8	22.2	.600	25	.670	1.000	3.5	12	.015	.094	78
WSL-100 A	1.000	1	25.4	.730	12	.084	.250	3.5	3	.010	.086	72
WSL-100 B	1.000	1	25.4	.730	12	.108	.333	3.5	4	.010	.086	53
WSL-100 C	1.000	1	25.4	.730	12	.145	.417	3.5	5	.010	.086	44
WSL-100 D	1.000	1	25.4	.730	12	.165	.500	3.5	6	.010	.086	36
WSL-100 E	1.000	1	25.4	.730	12	.201	.583	3.5	7	.010	.086	31
WSL-100 F	1.000	1	25.4	.730	12	.258	.750	3.5	9	.010	.086	24
WSL-100 G	1.000	1	25.4	.730	12	.342	1.000	3.5	12	.010	.086	18
WSL-100 H	1.000	1	25.4	.730	12	.445	1.250	3.5	15	.010	.086	15
WSL-100 I	1.000	1	25.4	.730	12	.519	1.500	3.5	18	.010	.086	12
WSL-100 J	1.000	1	25.4	.730	12	.633	1.750	3.5	21	.010	.086	11
WSL-100 K	1.000	1	25.4	.730	12	.710	2.000	3.5	24	.010	.086	9

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WSL,WSM, WSR Wave Springs

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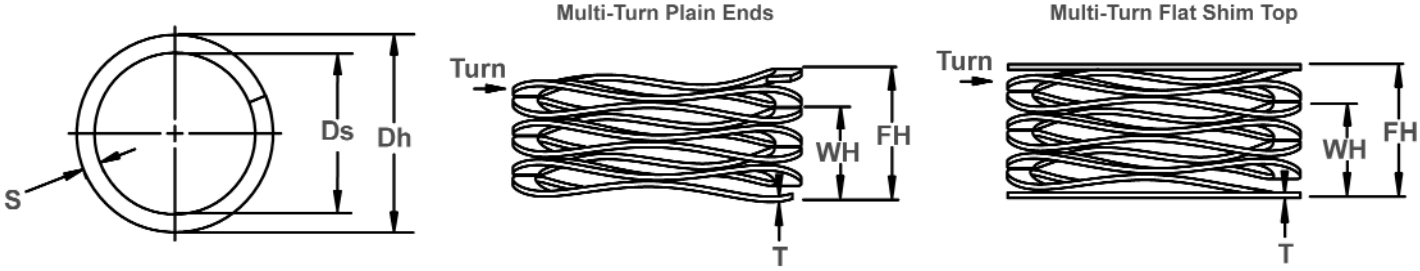
Used for low force applications with large deflections: More turns equals less force. Utilizes nearly half the space as helical compression springs while producing the same force.



Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER			SHAFT DIAMETER CLEARANCE	LOAD (lbs.)	WORK HEIGHT	FREE HEIGHT Ref.	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS	SECTION	SPRING RATE Ref. Lb/in.
	Dh DEC	Dh FRAC	Dh mm	Ds		WH	FH			T	S	
WSM-100 A	1.000	1	25.4	.730	18	.087	.250	3.5	3	.012	.094	110
WSM-100 B	1.000	1	25.4	.730	18	.113	.333	3.5	4	.012	.094	82
WSM-100 C	1.000	1	25.4	.730	18	.148	.417	3.5	5	.012	.094	67
WSM-100 D	1.000	1	25.4	.730	18	.175	.500	3.5	6	.012	.094	55
WSM-100 E	1.000	1	25.4	.730	18	.212	.583	3.5	7	.012	.094	49
WSM-100 F	1.000	1	25.4	.730	18	.276	.750	3.5	9	.012	.094	38
WSM-100 G	1.000	1	25.4	.730	18	.360	1.000	3.5	12	.012	.094	28
WSM-100 H	1.000	1	25.4	.730	18	.452	1.250	3.5	15	.012	.094	23
WSM-100 I	1.000	1	25.4	.730	18	.549	1.500	3.5	18	.012	.094	19
WSM-100 J	1.000	1	25.4	.730	18	.650	1.750	3.5	21	.012	.094	16
WSM-100 K	1.000	1	25.4	.730	18	.720	2.000	3.5	24	.012	.094	14
WSR-100 A	1.000	1	25.4	.730	25	.131	.250	3.5	3	.015	.094	210
WSR-100 B	1.000	1	25.4	.730	25	.174	.333	3.5	4	.015	.094	157
WSR-100 C	1.000	1	25.4	.730	25	.227	.417	3.5	5	.015	.094	132
WSR-100 D	1.000	1	25.4	.730	25	.266	.500	3.5	6	.015	.094	107
WSR-100 E	1.000	1	25.4	.730	25	.319	.583	3.5	7	.015	.094	95
WSR-100 F	1.000	1	25.4	.730	25	.406	.750	3.5	9	.015	.094	73
WSR-100 G	1.000	1	25.4	.730	25	.541	1.000	3.5	12	.015	.094	54
WSR-100 H	1.000	1	25.4	.730	25	.688	1.250	3.5	15	.015	.094	45
WSR-100 I	1.000	1	25.4	.730	25	.813	1.500	3.5	18	.015	.094	36
WSR-100 J	1.000	1	25.4	.730	25	.957	1.750	3.5	21	.015	.094	32
WSR-100 K	1.000	1	25.4	.730	25	1.083	2.000	3.5	24	.015	.094	27
WSL-112 A	1.125	1-1/8	28.6	.850	12	.146	.300	3.5	3	.012	.094	78
WSL-112 B	1.125	1-1/8	28.6	.850	12	.186	.400	3.5	4	.012	.094	56
WSL-112 C	1.125	1-1/8	28.6	.850	12	.250	.500	3.5	5	.012	.094	48
WSL-112 D	1.125	1-1/8	28.6	.850	12	.295	.600	3.5	6	.012	.094	39
WSL-112 E	1.125	1-1/8	28.6	.850	12	.344	.700	3.5	7	.012	.094	34
WSL-112 F	1.125	1-1/8	28.6	.850	12	.392	.800	3.5	8	.012	.094	29
WSL-112 G	1.125	1-1/8	28.6	.850	12	.488	1.000	3.5	10	.012	.094	23
WSL-112 H	1.125	1-1/8	28.6	.850	12	.659	1.300	3.5	13	.012	.094	19
WSL-112 I	1.125	1-1/8	28.6	.850	12	.807	1.600	3.5	16	.012	.094	15
WSL-112 J	1.125	1-1/8	28.6	.850	12	1.017	2.000	3.5	20	.012	.094	12
WSM-112 A	1.125	1-1/8	28.6	.850	20	.160	.300	3.5	3	.015	.094	143
WSM-112 B	1.125	1-1/8	28.6	.850	20	.202	.400	3.5	4	.015	.094	101
WSM-112 C	1.125	1-1/8	28.6	.850	20	.270	.500	3.5	5	.015	.094	87
WSM-112 D	1.125	1-1/8	28.6	.850	20	.318	.600	3.5	6	.015	.094	71
WSM-112 E	1.125	1-1/8	28.6	.850	20	.381	.700	3.5	7	.015	.094	63
WSM-112 F	1.125	1-1/8	28.6	.850	20	.427	.800	3.5	8	.015	.094	54
WSM-112 G	1.125	1-1/8	28.6	.850	20	.536	1.000	3.5	10	.015	.094	43
WSM-112 H	1.125	1-1/8	28.6	.850	20	.708	1.300	3.5	13	.015	.094	34
WSM-112 I	1.125	1-1/8	28.6	.850	20	.861	1.600	3.5	16	.015	.094	27
WSM-112 J	1.125	1-1/8	28.6	.850	20	1.088	2.000	3.5	20	.015	.094	22

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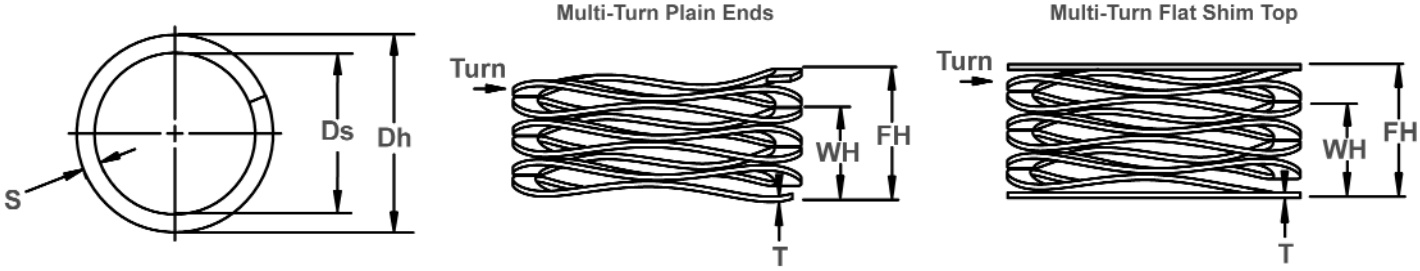

Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER			SHAFT DIAMETER CLEARANCE	LOAD (lbs.)	WORK HEIGHT	FREE HEIGHT Ref.	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS	SECTION	SPRING RATE Ref. Lb/in.
	Dh DEC	Dh FRAC	Dh mm	Ds		WH	FH			T	S	
WSR-112 A	1.125	1-1/8	28.6	.850	30	.178	.300	3.5	3	.018	.094	246
WSR-112 B	1.125	1-1/8	28.6	.850	30	.229	.400	3.5	4	.018	.094	175
WSR-112 C	1.125	1-1/8	28.6	.850	30	.303	.500	3.5	5	.018	.094	152
WSR-112 D	1.125	1-1/8	28.6	.850	30	.350	.600	3.5	6	.018	.094	120
WSR-112 E	1.125	1-1/8	28.6	.850	30	.421	.700	3.5	7	.018	.094	108
WSR-112 F	1.125	1-1/8	28.6	.850	30	.470	.800	3.5	8	.018	.094	91
WSR-112 G	1.125	1-1/8	28.6	.850	30	.593	1.000	3.5	10	.018	.094	74
WSR-112 H	1.125	1-1/8	28.6	.850	30	.787	1.300	3.5	13	.018	.094	58
WSR-112 I	1.125	1-1/8	28.6	.850	30	.956	1.600	3.5	16	.018	.094	47
WSR-112 J	1.125	1-1/8	28.6	.850	30	1.202	2.000	3.5	20	.018	.094	38
WSL-125 A	1.250	1-1/4	31.7	1.000	12	.084	.300	3.5	3	.012	.094	56
WSL-125 B	1.250	1-1/4	31.7	1.000	12	.113	.400	3.5	4	.012	.094	42
WSL-125 C	1.250	1-1/4	31.7	1.000	12	.149	.500	3.5	5	.012	.094	34
WSL-125 D	1.250	1-1/4	31.7	1.000	12	.172	.600	3.5	6	.012	.094	28
WSL-125 E	1.250	1-1/4	31.7	1.000	12	.207	.700	3.5	7	.012	.094	24
WSL-125 F	1.250	1-1/4	31.7	1.000	12	.227	.800	3.5	8	.012	.094	21
WSL-125 G	1.250	1-1/4	31.7	1.000	12	.301	1.000	3.5	10	.012	.094	17
WSL-125 H	1.250	1-1/4	31.7	1.000	12	.395	1.300	3.5	13	.012	.094	13
WSL-125 I	1.250	1-1/4	31.7	1.000	12	.467	1.600	3.5	16	.012	.094	11
WSL-125 J	1.250	1-1/4	31.7	1.000	12	.591	2.000	3.5	20	.012	.094	9
WSM-125 A	1.250	1-1/4	31.7	1.000	20	.124	.300	3.5	3	.015	.094	114
WSM-125 B	1.250	1-1/4	31.7	1.000	20	.165	.400	3.5	4	.015	.094	85
WSM-125 C	1.250	1-1/4	31.7	1.000	20	.215	.500	3.5	5	.015	.094	70
WSM-125 D	1.250	1-1/4	31.7	1.000	20	.253	.600	3.5	6	.015	.094	58
WSM-125 E	1.250	1-1/4	31.7	1.000	20	.303	.700	3.5	7	.015	.094	50
WSM-125 F	1.250	1-1/4	31.7	1.000	20	.341	.800	3.5	8	.015	.094	44
WSM-125 G	1.250	1-1/4	31.7	1.000	20	.427	1.000	3.5	10	.015	.094	35
WSM-125 H	1.250	1-1/4	31.7	1.000	20	.577	1.300	3.5	13	.015	.094	28
WSM-125 I	1.250	1-1/4	31.7	1.000	20	.692	1.600	3.5	16	.015	.094	22
WSM-125 J	1.250	1-1/4	31.7	1.000	20	.866	2.000	3.5	20	.015	.094	18
WSR-125 A	1.250	1-1/4	31.7	1.000	30	.158	.300	3.5	3	.019	.094	210
WSR-125 B	1.250	1-1/4	31.7	1.000	30	.210	.400	3.5	4	.019	.094	158
WSR-125 C	1.250	1-1/4	31.7	1.000	30	.272	.500	3.5	5	.019	.094	132
WSR-125 D	1.250	1-1/4	31.7	1.000	30	.320	.600	3.5	6	.019	.094	107
WSR-125 E	1.250	1-1/4	31.7	1.000	30	.384	.700	3.5	7	.019	.094	95
WSR-125 F	1.250	1-1/4	31.7	1.000	30	.433	.800	3.5	8	.019	.094	82
WSR-125 G	1.250	1-1/4	31.7	1.000	30	.538	1.000	3.5	10	.019	.094	65
WSR-125 H	1.250	1-1/4	31.7	1.000	30	.717	1.300	3.5	13	.019	.094	51
WSR-125 I	1.250	1-1/4	31.7	1.000	30	.878	1.600	3.5	16	.019	.094	42
WSR-125 J	1.250	1-1/4	31.7	1.000	30	1.103	2.000	3.5	20	.019	.094	33

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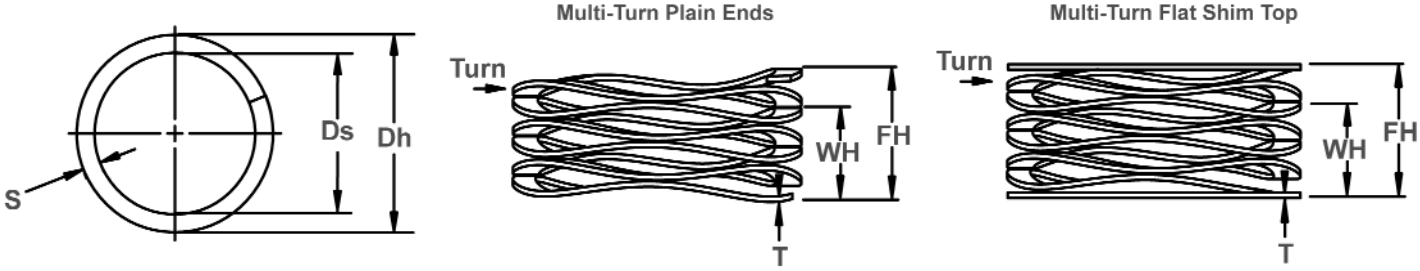

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	Dh DEC	Dh FRAC	Dh mm	Ds		WH	FH			T	S	
WSL-137 A	1.375	1-3/8	34.9	1.030	15	.075	.300	3.5	3	.012	.122	67
WSL-137 B	1.375	1-3/8	34.9	1.030	15	.099	.400	3.5	4	.012	.122	50
WSL-137 C	1.375	1-3/8	34.9	1.030	15	.129	.500	3.5	5	.012	.122	40
WSL-137 D	1.375	1-3/8	34.9	1.030	15	.155	.600	3.5	6	.012	.122	34
WSL-137 E	1.375	1-3/8	34.9	1.030	15	.179	.700	3.5	7	.012	.122	29
WSL-137 F	1.375	1-3/8	34.9	1.030	15	.206	.800	3.5	8	.012	.122	25
WSL-137 G	1.375	1-3/8	34.9	1.030	15	.256	1.000	3.5	10	.012	.122	20
WSL-137 H	1.375	1-3/8	34.9	1.030	15	.341	1.300	3.5	13	.012	.122	16
WSL-137 I	1.375	1-3/8	34.9	1.030	15	.424	1.600	3.5	16	.012	.122	13
WSL-137 J	1.375	1-3/8	34.9	1.030	15	.530	2.000	3.5	20	.012	.122	10
WSM-137 A	1.375	1-3/8	34.9	1.030	25	.142	.300	3.5	3	.016	.133	158
WSM-137 B	1.375	1-3/8	34.9	1.030	25	.186	.400	3.5	4	.016	.133	117
WSM-137 C	1.375	1-3/8	34.9	1.030	25	.240	.500	3.5	5	.016	.133	96
WSM-137 D	1.375	1-3/8	34.9	1.030	25	.281	.600	3.5	6	.016	.133	78
WSM-137 E	1.375	1-3/8	34.9	1.030	25	.340	.700	3.5	7	.016	.133	69
WSM-137 F	1.375	1-3/8	34.9	1.030	25	.384	.800	3.5	8	.016	.133	60
WSM-137 G	1.375	1-3/8	34.9	1.030	25	.486	1.000	3.5	10	.016	.133	49
WSM-137 H	1.375	1-3/8	34.9	1.030	25	.632	1.300	3.5	13	.016	.133	37
WSM-137 I	1.375	1-3/8	34.9	1.030	25	.788	1.600	3.5	16	.016	.133	31
WSM-137 J	1.375	1-3/8	34.9	1.030	25	.982	2.000	3.5	20	.016	.133	25
WSR-137 A	1.375	1-3/8	34.9	1.030	35	.149	.300	3.5	3	.018	.133	232
WSR-137 B	1.375	1-3/8	34.9	1.030	35	.189	.400	3.5	4	.018	.133	166
WSR-137 C	1.375	1-3/8	34.9	1.030	35	.247	.500	3.5	5	.018	.133	138
WSR-137 D	1.375	1-3/8	34.9	1.030	35	.287	.600	3.5	6	.018	.133	112
WSR-137 E	1.375	1-3/8	34.9	1.030	35	.343	.700	3.5	7	.018	.133	98
WSR-137 F	1.375	1-3/8	34.9	1.030	35	.390	.800	3.5	8	.018	.133	85
WSR-137 G	1.375	1-3/8	34.9	1.030	35	.490	1.000	3.5	10	.018	.133	69
WSR-137 H	1.375	1-3/8	34.9	1.030	35	.646	1.300	3.5	13	.018	.133	54
WSR-137 I	1.375	1-3/8	34.9	1.030	35	.793	1.600	3.5	16	.018	.133	43
WSR-137 J	1.375	1-3/8	34.9	1.030	35	1.000	2.000	3.5	20	.018	.133	35
WSL-150 A	1.500	1-1/2	38.1	1.140	20	.129	.300	3.5	3	.016	.133	117
WSL-150 B	1.500	1-1/2	38.1	1.140	20	.164	.400	3.5	4	.016	.133	85
WSL-150 C	1.500	1-1/2	38.1	1.140	20	.213	.500	3.5	5	.016	.133	70
WSL-150 D	1.500	1-1/2	38.1	1.140	20	.247	.600	3.5	6	.016	.133	57
WSL-150 E	1.500	1-1/2	38.1	1.140	20	.301	.700	3.5	7	.016	.133	50
WSL-150 F	1.500	1-1/2	38.1	1.140	20	.337	.800	3.5	8	.016	.133	43
WSL-150 G	1.500	1-1/2	38.1	1.140	20	.430	1.000	3.5	10	.016	.133	35
WSL-150 H	1.500	1-1/2	38.1	1.140	20	.565	1.300	3.5	13	.016	.133	27
WSL-150 I	1.500	1-1/2	38.1	1.140	20	.694	1.600	3.5	16	.016	.133	22
WSL-150 J	1.500	1-1/2	38.1	1.140	20	.866	2.000	3.5	20	.016	.133	18

PART NUMBERS SHOWN REFLECT MULTI-TURN WAVE SPRINGS WITH PLAIN ENDS.
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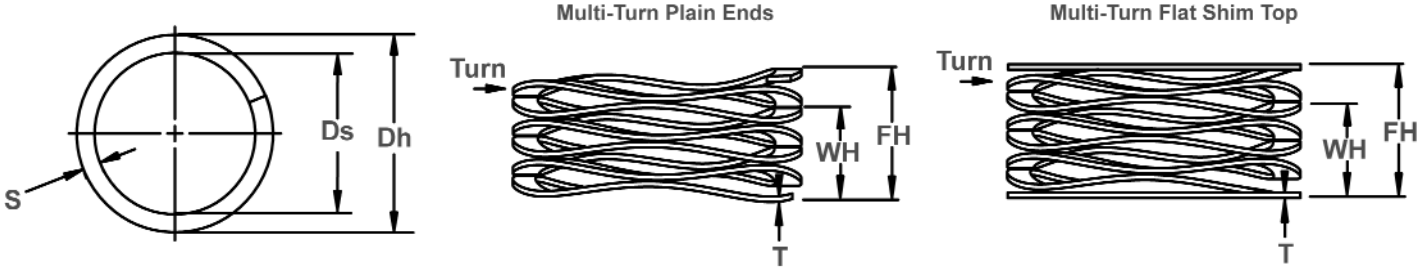

Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER			SHAFT DIAMETER CLEARANCE	LOAD (lbs.)	WORK HEIGHT	FREE HEIGHT Ref.	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS	SECTION	SPRING RATE Ref. Lb/in.
	Dh DEC	Dh FRAC	Dh mm	Ds		WH	FH			T	S	
WSM-150 A	1.500	1-1/2	38.1	1.140	35	.122	.300	3.5	3	.018	.133	197
WSM-150 B	1.500	1-1/2	38.1	1.140	35	.158	.400	3.5	4	.018	.133	145
WSM-150 C	1.500	1-1/2	38.1	1.140	35	.206	.500	3.5	5	.018	.133	119
WSM-150 D	1.500	1-1/2	38.1	1.140	35	.241	.600	3.5	6	.018	.133	97
WSM-150 E	1.500	1-1/2	38.1	1.140	35	.291	.700	3.5	7	.018	.133	86
WSM-150 F	1.500	1-1/2	38.1	1.140	35	.324	.800	3.5	8	.018	.133	74
WSM-150 G	1.500	1-1/2	38.1	1.140	35	.409	1.000	3.5	10	.018	.133	59
WSM-150 H	1.500	1-1/2	38.1	1.140	35	.540	1.300	3.5	13	.018	.133	46
WSM-150 I	1.500	1-1/2	38.1	1.140	35	.657	1.600	3.5	16	.018	.133	37
WSM-150 J	1.500	1-1/2	38.1	1.140	35	.835	2.000	3.5	20	.018	.133	30
WSR-150 A	1.500	1-1/2	38.1	1.140	60	.166	.300	4.5	3	.018	.133	448
WSR-150 B	1.500	1-1/2	38.1	1.140	60	.216	.400	4.5	4	.018	.133	326
WSR-150 C	1.500	1-1/2	38.1	1.140	60	.278	.500	4.5	5	.018	.133	270
WSR-150 D	1.500	1-1/2	38.1	1.140	60	.329	.600	4.5	6	.018	.133	221
WSR-150 E	1.500	1-1/2	38.1	1.140	60	.390	.700	4.5	7	.018	.133	194
WSR-150 F	1.500	1-1/2	38.1	1.140	60	.443	.800	4.5	8	.018	.133	168
WSR-150 G	1.500	1-1/2	38.1	1.140	60	.555	1.000	4.5	10	.018	.133	135
WSR-150 H	1.500	1-1/2	38.1	1.140	60	.726	1.300	4.5	13	.018	.133	105
WSR-150 I	1.500	1-1/2	38.1	1.140	60	.890	1.600	4.5	16	.018	.133	85
WSR-150 J	1.500	1-1/2	38.1	1.140	60	1.119	2.000	4.5	20	.018	.133	68
WSL-175 A	1.750	1-3/4	44.4	1.340	25	.155	.375	3.5	3	.018	.143	114
WSL-175 B	1.750	1-3/4	44.4	1.340	25	.200	.500	3.5	4	.018	.143	83
WSL-175 C	1.750	1-3/4	44.4	1.340	25	.265	.625	3.5	5	.018	.143	69
WSL-175 D	1.750	1-3/4	44.4	1.340	25	.310	.750	3.5	6	.018	.143	57
WSL-175 E	1.750	1-3/4	44.4	1.340	25	.367	.870	3.5	7	.018	.143	50
WSL-175 F	1.750	1-3/4	44.4	1.340	25	.415	1.000	3.5	8	.018	.143	43
WSL-175 G	1.750	1-3/4	44.4	1.340	25	.523	1.250	3.5	10	.018	.143	34
WSL-175 H	1.750	1-3/4	44.4	1.340	25	.638	1.500	3.5	12	.018	.143	29
WSL-175 I	1.750	1-3/4	44.4	1.340	25	.737	1.750	3.5	14	.018	.143	25
WSL-175 J	1.750	1-3/4	44.4	1.340	25	.844	2.000	3.5	16	.018	.143	22
WSM-175 A	1.750	1-3/4	44.4	1.340	50	.188	.375	4.5	3	.018	.143	267
WSM-175 B	1.750	1-3/4	44.4	1.340	50	.244	.500	4.5	4	.018	.143	195
WSM-175 C	1.750	1-3/4	44.4	1.340	50	.315	.625	4.5	5	.018	.143	161
WSM-175 D	1.750	1-3/4	44.4	1.340	50	.374	.750	4.5	6	.018	.143	133
WSM-175 E	1.750	1-3/4	44.4	1.340	50	.452	.870	4.5	7	.018	.143	120
WSM-175 F	1.750	1-3/4	44.4	1.340	50	.505	1.000	4.5	8	.018	.143	101
WSM-175 G	1.750	1-3/4	44.4	1.340	50	.629	1.250	4.5	10	.018	.143	81
WSM-175 H	1.750	1-3/4	44.4	1.340	50	.768	1.500	4.5	12	.018	.143	68
WSM-175 I	1.750	1-3/4	44.4	1.340	50	.899	1.750	4.5	14	.018	.143	59
WSM-175 J	1.750	1-3/4	44.4	1.340	50	1.026	2.000	4.5	16	.018	.143	51

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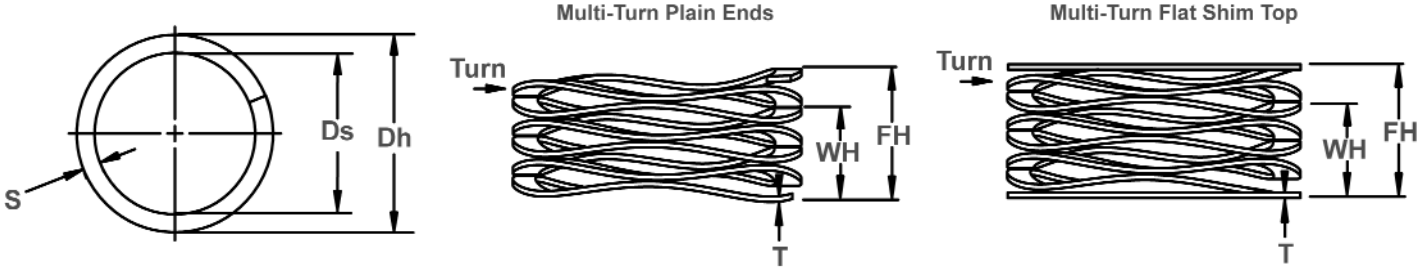
WSL,WSM, WSR Wave Springs

Multi Turn, Inch

Used for low force applications with large deflections: More turns equals less force. Utilizes nearly half the space as helical compression springs while producing the same force.



Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER			SHAFT DIAMETER CLEARANCE	LOAD (lbs.)	WORK HEIGHT	FREE HEIGHT Ref.	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS	SECTION	SPRING RATE Ref. Lb/in.
	Dh DEC	Dh FRAC	Dh mm	Ds		WH	FH			T	S	
WSR-175 A	1.750	1-3/4	44.4	1.340	90	.232	.375	4.5	3	.024	.148	629
WSR-175 B	1.750	1-3/4	44.4	1.340	90	.314	.500	4.5	4	.024	.148	484
WSR-175 C	1.750	1-3/4	44.4	1.340	90	.409	.625	4.5	5	.024	.148	417
WSR-175 D	1.750	1-3/4	44.4	1.340	90	.482	.750	4.5	6	.024	.148	336
WSR-175 E	1.750	1-3/4	44.4	1.340	90	.577	.870	4.5	7	.024	.148	307
WSR-175 F	1.750	1-3/4	44.4	1.340	90	.651	1.000	4.5	8	.024	.148	258
WSR-175 G	1.750	1-3/4	44.4	1.340	90	.813	1.250	4.5	10	.024	.148	206
WSR-175 H	1.750	1-3/4	44.4	1.340	90	.980	1.500	4.5	12	.024	.148	173
WSR-175 I	1.750	1-3/4	44.4	1.340	90	1.147	1.750	4.5	14	.024	.148	149
WSR-175 J	1.750	1-3/4	44.4	1.340	90	1.317	2.000	4.5	16	.024	.148	132
WSL-200 A	2.000	2	50.8	1.600	25	.094	.375	3.5	3	.018	.143	89
WSL-200 B	2.000	2	50.8	1.600	25	.120	.500	3.5	4	.018	.143	66
WSL-200 C	2.000	2	50.8	1.600	25	.158	.625	3.5	5	.018	.143	54
WSL-200 D	2.000	2	50.8	1.600	25	.179	.750	3.5	6	.018	.143	44
WSL-200 E	2.000	2	50.8	1.600	25	.217	.870	3.5	7	.018	.143	38
WSL-200 F	2.000	2	50.8	1.600	25	.243	1.000	3.5	8	.018	.143	33
WSL-200 G	2.000	2	50.8	1.600	25	.306	1.250	3.5	10	.018	.143	26
WSL-200 H	2.000	2	50.8	1.600	25	.365	1.500	3.5	12	.018	.143	22
WSL-200 I	2.000	2	50.8	1.600	25	.433	1.750	3.5	14	.018	.143	19
WSL-200 J	2.000	2	50.8	1.600	25	.490	2.000	3.5	16	.018	.143	17
WSM-200 A	2.000	2	50.8	1.600	50	.140	.375	4.5	3	.018	.143	213
WSM-200 B	2.000	2	50.8	1.600	50	.184	.500	4.5	4	.018	.143	158
WSM-200 C	2.000	2	50.8	1.600	50	.245	.625	4.5	5	.018	.143	132
WSM-200 D	2.000	2	50.8	1.600	50	.278	.750	4.5	6	.018	.143	106
WSM-200 E	2.000	2	50.8	1.600	50	.345	.870	4.5	7	.018	.143	95
WSM-200 F	2.000	2	50.8	1.600	50	.395	1.000	4.5	8	.018	.143	83
WSM-200 G	2.000	2	50.8	1.600	50	.498	1.250	4.5	10	.018	.143	66
WSM-200 H	2.000	2	50.8	1.600	50	.593	1.500	4.5	12	.018	.143	55
WSM-200 I	2.000	2	50.8	1.600	50	.694	1.750	4.5	14	.018	.143	47
WSM-200 J	2.000	2	50.8	1.600	50	.800	2.000	4.5	16	.018	.143	42
WSR-200 A	2.000	2	50.8	1.600	90	.197	.375	4.5	3	.024	.148	506
WSR-200 B	2.000	2	50.8	1.600	90	.258	.500	4.5	4	.024	.148	372
WSR-200 C	2.000	2	50.8	1.600	90	.332	.625	4.5	5	.024	.148	307
WSR-200 D	2.000	2	50.8	1.600	90	.389	.750	4.5	6	.024	.148	249
WSR-200 E	2.000	2	50.8	1.600	90	.465	.870	4.5	7	.024	.148	222
WSR-200 F	2.000	2	50.8	1.600	90	.525	1.000	4.5	8	.024	.148	189
WSR-200 G	2.000	2	50.8	1.600	90	.661	1.250	4.5	10	.024	.148	153
WSR-200 H	2.000	2	50.8	1.600	90	.781	1.500	4.5	12	.024	.148	125
WSR-200 I	2.000	2	50.8	1.600	90	.941	1.750	4.5	14	.024	.148	111
WSR-200 J	2.000	2	50.8	1.600	90	1.069	2.000	4.5	16	.024	.148	97

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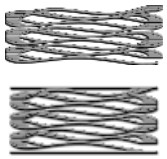
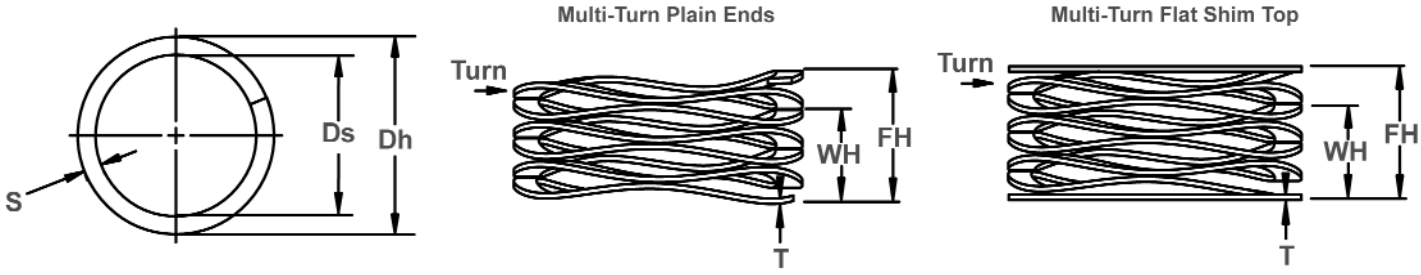
Multi Turn, Metric

Used for low force applications with large deflections: More turns equals less force. Utilizes nearly half the space as helical compression springs while producing the same force.

MWL,MWM, MWR Wave Springs





Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER Dh mm	SHAFT DIAMETER CLEARANCE Ds	LOAD (N)	WORK HEIGHT WH	FREE HEIGHT Ref. FH	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS T	SECTION S	SPRING RATE Ref. N/mm
MWL-6 A*	6	4	6	0.61	1.52	2.5	3	0.13	0.51	6.56
MWL-6 B*	6	4	6	0.81	2.03	2.5	4	0.13	0.51	4.92
MWL-6 C*	6	4	6	1.02	2.54	2.5	5	0.13	0.51	3.94
MWL-6 D*	6	4	6	1.22	3.05	2.5	6	0.13	0.51	3.28
MWL-6 E*	6	4	6	1.42	3.56	2.5	7	0.13	0.51	2.81
MWL-6 F*	6	4	6	1.63	4.06	2.5	8	0.13	0.51	2.46
MWL-6 G*	6	4	6	1.83	4.57	2.5	9	0.13	0.51	2.19
MWL-6 H*	6	4	6	2.24	5.59	2.5	11	0.13	0.51	1.79
MWL-6 I*	6	4	6	2.64	6.60	2.5	13	0.13	0.51	1.51
MWM-6 A*	6	4	12	0.74	1.52	2.5	3	0.15	0.61	15.24
MWM-6 B*	6	4	12	0.97	2.03	2.5	4	0.15	0.61	11.25
MWM-6 C*	6	4	12	1.22	2.54	2.5	5	0.15	0.61	9.09
MWM-6 D*	6	4	12	1.47	3.05	2.5	6	0.15	0.61	7.62
MWM-6 E*	6	4	12	1.70	3.56	2.5	7	0.15	0.61	6.47
MWM-6 F*	6	4	12	1.96	4.06	2.5	8	0.15	0.61	5.69
MWM-6 G*	6	4	12	2.18	4.57	2.5	9	0.15	0.61	5.03
MWM-6 H*	6	4	12	2.69	5.59	2.5	11	0.15	0.61	4.14
MWM-6 I*	6	4	12	3.18	6.60	2.5	13	0.15	0.61	3.50
MWL-8 A	8	5	15	1.70	2.82	2.5	3	0.20	0.81	13.42
MWL-8 B	8	5	15	2.39	3.76	2.5	4	0.20	0.81	10.94
MWL-8 C	8	5	15	2.74	4.70	2.5	5	0.20	0.81	7.67
MWL-8 D	8	5	15	3.56	5.64	2.5	6	0.20	0.81	7.20
MWL-8 E	8	5	15	4.01	6.58	2.5	7	0.20	0.81	5.85
MWL-8 F	8	5	15	4.57	7.52	2.5	8	0.20	0.81	5.09
MWL-8 G	8	5	15	5.26	8.46	2.5	9	0.20	0.81	4.69
MWL-8 H	8	5	15	6.35	10.34	2.5	11	0.20	0.81	3.76
MWL-8 I	8	5	15	7.37	12.22	2.5	13	0.20	0.81	3.09
MWM-8 A	8	5	30	1.78	2.82	2.5	3	0.25	0.81	28.81
MWM-8 B	8	5	30	2.54	3.76	2.5	4	0.25	0.81	24.61
MWM-8 C	8	5	30	3.05	4.70	2.5	5	0.25	0.81	18.17
MWM-8 D	8	5	30	3.81	5.64	2.5	6	0.25	0.81	16.40
MWM-8 E	8	5	30	4.32	6.58	2.5	7	0.25	0.81	13.27
MWM-8 F	8	5	30	4.95	7.52	2.5	8	0.25	0.81	11.69
MWM-8 G	8	5	30	5.59	8.46	2.5	9	0.25	0.81	10.45
MWM-8 H	8	5	30	6.86	10.34	2.5	11	0.25	0.81	8.62
MWM-8 I	8	5	30	7.87	12.22	2.5	13	0.25	0.81	6.91

***Not available with shim ends**
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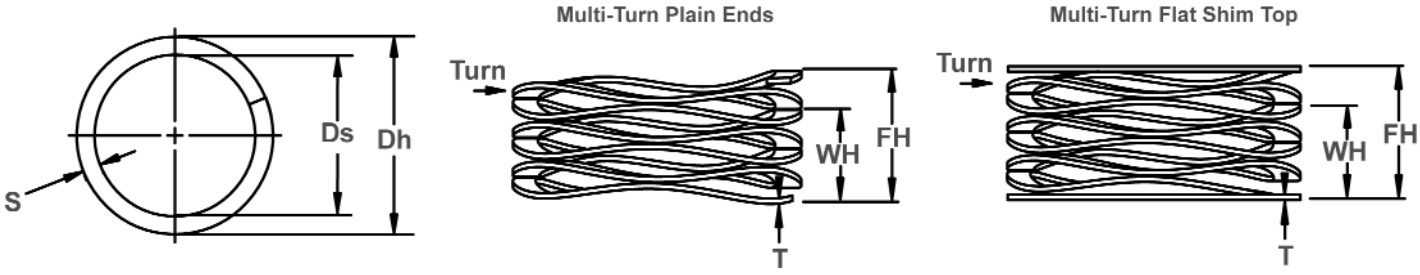
MWL,MWM, MWR Wave Springs

Multi Turn, Metric

Used for low force applications with large deflections: More turns equals less force. Utilizes nearly half the space as helical compression springs while producing the same force.



Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER Dh mm	SHAFT DIAMETER CLEARANCE Ds	LOAD (N)	WORK HEIGHT WH	FREE HEIGHT Ref. FH	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS T	SECTION S	SPRING RATE Ref. N/mm
MWL-10 A	10	7	18	1.91	3.96	2.5	3	0.20	0.81	8.75
MWL-10 B	10	7	18	2.54	5.28	2.5	4	0.20	0.81	6.56
MWL-10 C	10	7	18	3.15	6.60	2.5	5	0.20	0.81	5.21
MWL-10 D	10	7	18	3.78	7.92	2.5	6	0.20	0.81	4.35
MWL-10 E	10	7	18	4.42	9.25	2.5	7	0.20	0.81	3.73
MWL-10 F	10	7	18	5.05	10.57	2.5	8	0.20	0.81	3.27
MWL-10 G	10	7	18	5.69	11.89	2.5	9	0.20	0.81	2.90
MWL-10 H	10	7	18	6.32	13.21	2.5	10	0.20	0.81	2.61
MWL-10 I	10	7	18	6.96	14.53	2.5	11	0.20	0.81	2.38
MWM-10 A	10	7	35	2.03	3.96	2.5	3	0.28	0.81	18.13
MWM-10 B	10	7	35	2.79	5.28	2.5	4	0.28	0.81	14.06
MWM-10 C	10	7	35	3.56	6.60	2.5	5	0.28	0.81	11.48
MWM-10 D	10	7	35	4.32	7.92	2.5	6	0.28	0.81	9.70
MWM-10 E	10	7	35	5.08	9.25	2.5	7	0.28	0.81	8.40
MWM-10 F	10	7	35	5.84	10.57	2.5	8	0.28	0.81	7.41
MWM-10 G	10	7	35	6.60	11.89	2.5	9	0.28	0.81	6.62
MWM-10 H	10	7	35	7.37	13.21	2.5	10	0.28	0.81	5.99
MWM-10 I	10	7	35	8.13	14.53	2.5	11	0.28	0.81	5.47
MWL-12 A	12	9	20	1.47	4.34	2.5	3	0.20	1.02	6.97
MWL-12 B	12	9	20	1.98	5.79	2.5	4	0.20	1.02	5.25
MWL-12 C	12	9	20	2.46	7.24	2.5	5	0.20	1.02	4.19
MWL-12 D	12	9	20	2.95	8.69	2.5	6	0.20	1.02	3.48
MWL-12 E	12	9	20	3.45	10.13	2.5	7	0.20	1.02	2.99
MWL-12 F	12	9	20	3.94	11.58	2.5	8	0.20	1.02	2.62
MWL-12 G	12	9	20	4.45	13.03	2.5	9	0.20	1.02	2.33
MWL-12 H	12	9	20	4.93	14.48	2.5	10	0.20	1.02	2.09
MWL-12 I	12	9	20	5.44	15.93	2.5	11	0.20	1.02	1.91
MWM-12 A	12	8.5	40	2.36	4.34	2.5	3	0.28	1.17	20.19
MWM-12 B	12	8.5	40	3.18	5.79	2.5	4	0.28	1.17	15.29
MWM-12 C	12	8.5	40	3.96	7.24	2.5	5	0.28	1.17	12.21
MWM-12 D	12	8.5	40	4.75	8.69	2.5	6	0.28	1.17	10.16
MWM-12 E	12	8.5	40	5.54	10.13	2.5	7	0.28	1.17	8.70
MWM-12 F	12	8.5	40	6.32	11.58	2.5	8	0.28	1.17	7.61
MWM-12 G	12	8.5	40	7.11	13.03	2.5	9	0.28	1.17	6.76
MWM-12 H	12	8.5	40	7.92	14.48	2.5	10	0.28	1.17	6.10
MWM-12 I	12	8.5	40	8.71	15.93	2.5	11	0.28	1.17	5.55

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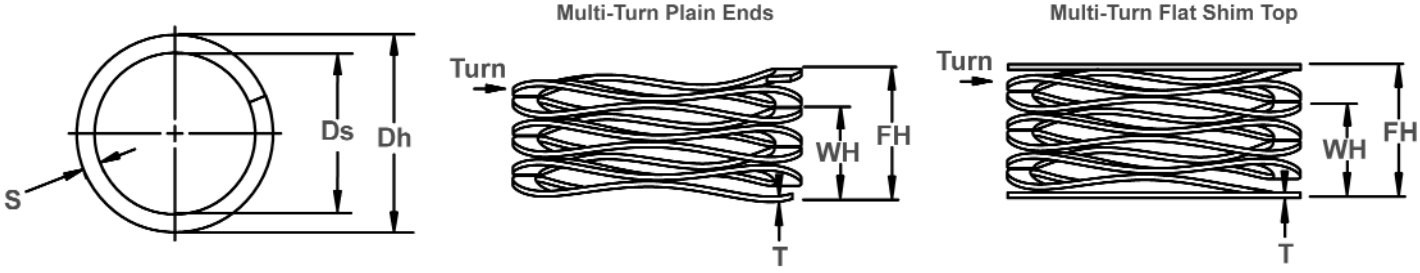

Wave Spring Measurements

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MWR-12 A	12	8.5	60	1.98	4.34	2.5	3	0.30	1.14	25.40
MWR-12 B	12	8.5	60	2.64	5.79	2.5	4	0.30	1.14	19.05
MWR-12 C	12	8.5	60	3.30	7.24	2.5	5	0.30	1.14	15.24
MWR-12 D	12	8.5	60	3.99	8.69	2.5	6	0.30	1.14	12.77
MWR-12 E	12	8.5	60	4.65	10.13	2.5	7	0.30	1.14	10.94
MWR-12 F	12	8.5	60	5.31	11.58	2.5	8	0.30	1.14	9.56
MWR-12 G	12	8.5	60	5.97	13.03	2.5	9	0.30	1.14	8.50
MWR-12 H	12	8.5	60	6.63	14.48	2.5	10	0.30	1.14	7.64
MWR-12 I	12	8.5	60	7.29	15.93	2.5	11	0.30	1.14	6.95
MWL-14 A	14	10	22	2.18	4.95	2.5	3	0.23	1.47	7.95
MWL-14 B	14	10	22	2.95	6.60	2.5	4	0.23	1.47	6.01
MWL-14 C	14	10	22	3.71	8.26	2.5	5	0.23	1.47	4.84
MWL-14 D	14	10	22	4.52	9.91	2.5	6	0.23	1.47	4.09
MWL-14 E	14	10	22	5.33	11.56	2.5	7	0.23	1.47	3.54
MWL-14 F	14	10	22	6.17	13.21	2.5	8	0.23	1.47	3.13
MWL-14 G	14	10	22	7.01	14.86	2.5	9	0.23	1.47	2.80
MWL-14 H	14	10	22	7.85	16.51	2.5	10	0.23	1.47	2.54
MWL-14 I	14	10	22	8.71	18.16	2.5	11	0.23	1.47	2.33
MWM-14 A	14	10	50	2.18	4.95	2.5	3	0.30	1.52	18.06
MWM-14 B	14	10	50	2.95	6.60	2.5	4	0.30	1.52	13.67
MWM-14 C	14	10	50	3.71	8.26	2.5	5	0.30	1.52	11.00
MWM-14 D	14	10	50	4.52	9.91	2.5	6	0.30	1.52	9.29
MWM-14 E	14	10	50	5.33	11.56	2.5	7	0.30	1.52	8.03
MWM-14 F	14	10	50	6.17	13.21	2.5	8	0.30	1.52	7.11
MWM-14 G	14	10	50	7.01	14.86	2.5	9	0.30	1.52	6.37
MWM-14 H	14	10	50	7.85	16.51	2.5	10	0.30	1.52	5.77
MWM-14 I	14	10	50	8.71	18.16	2.5	11	0.30	1.52	5.29
MWR-14 A	14	9	80	3.15	4.95	2.5	3	0.38	1.52	44.36
MWR-14 B	14	9	80	4.19	6.60	2.5	4	0.38	1.52	33.15
MWR-14 C	14	9	80	5.26	8.26	2.5	5	0.38	1.52	26.69
MWR-14 D	14	9	80	6.30	9.91	2.5	6	0.38	1.52	22.18
MWR-14 E	14	9	80	7.34	11.56	2.5	7	0.38	1.52	18.97
MWR-14 F	14	9	80	8.41	13.21	2.5	8	0.38	1.52	16.66
MWR-14 G	14	9	80	9.45	14.86	2.5	9	0.38	1.52	14.79
MWR-14 H	14	9	80	10.49	16.51	2.5	10	0.38	1.52	13.29
MWR-14 I	14	9	80	11.56	18.16	2.5	11	0.38	1.52	12.11

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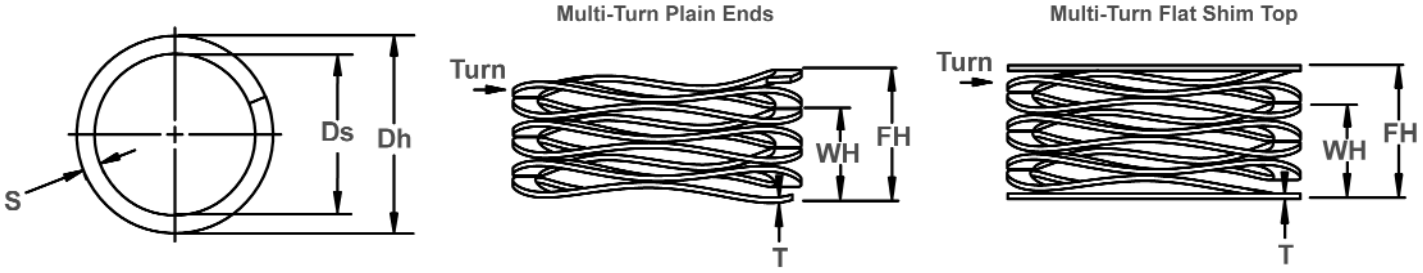

Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER Dh mm	SHAFT DIAMETER CLEARANCE Ds	LOAD (N)	WORK HEIGHT WH	FREE HEIGHT Ref. FH	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS T	SECTION S	SPRING RATE Ref. N/mm
MWL-15 A	15	11	25	2.57	5.18	2.5	3	0.25	1.47	9.56
MWL-15 B	15	11	25	3.43	6.91	2.5	4	0.25	1.47	7.18
MWL-15 C	15	11	25	4.27	8.64	2.5	5	0.25	1.47	5.72
MWL-15 D	15	11	25	5.13	10.36	2.5	6	0.25	1.47	4.78
MWL-15 E	15	11	25	5.99	12.09	2.5	7	0.25	1.47	4.10
MWL-15 F	15	11	25	6.83	13.82	2.5	8	0.25	1.47	3.58
MWL-15 G	15	11	25	7.70	15.54	2.5	9	0.25	1.47	3.19
MWL-15 H	15	11	25	8.53	17.27	2.5	10	0.25	1.47	2.86
MWL-15 I	15	11	25	9.40	19.00	2.5	11	0.25	1.47	2.60
MWM-15 A	15	10	50	3.43	5.18	3.5	3	0.23	1.47	28.53
MWM-15 B	15	10	50	4.57	6.91	3.5	4	0.23	1.47	21.40
MWM-15 C	15	10	50	5.72	8.64	3.5	5	0.23	1.47	17.12
MWM-15 D	15	10	50	6.86	10.36	3.5	6	0.23	1.47	14.26
MWM-15 E	15	10	50	8.00	12.09	3.5	7	0.23	1.47	12.23
MWM-15 F	15	10	50	9.14	13.82	3.5	8	0.23	1.47	10.70
MWM-15 G	15	10	50	10.29	15.54	3.5	9	0.23	1.47	9.51
MWM-15 H	15	10	50	11.43	17.27	3.5	10	0.23	1.47	8.56
MWM-15 I	15	10	50	12.57	19.00	3.5	11	0.23	1.47	7.78
MWR-15 A	15	10	80	3.20	5.18	3.5	3	0.25	1.47	40.38
MWR-15 B	15	10	80	4.19	6.91	3.5	4	0.25	1.47	29.44
MWR-15 C	15	10	80	5.23	8.64	3.5	5	0.25	1.47	23.50
MWR-15 D	15	10	80	6.27	10.36	3.5	6	0.25	1.47	19.56
MWR-15 E	15	10	80	7.32	12.09	3.5	7	0.25	1.47	16.75
MWR-15 F	15	10	80	8.36	13.82	3.5	8	0.25	1.47	14.65
MWR-15 G	15	10	80	9.40	15.54	3.5	9	0.25	1.47	13.01
MWR-15 H	15	10	80	10.46	17.27	3.5	10	0.25	1.47	11.75
MWR-15 I	15	10	80	11.51	19.00	3.5	11	0.25	1.47	10.68
MWL-16 A	16	11	25	2.11	5.41	2.5	3	0.25	1.47	7.57
MWL-16 B	16	11	25	2.79	7.21	2.5	4	0.25	1.47	5.66
MWL-16 C	16	11	25	3.51	9.02	2.5	5	0.25	1.47	4.54
MWL-16 D	16	11	25	4.19	10.82	2.5	6	0.25	1.47	3.77
MWL-16 E	16	11	25	4.90	12.62	2.5	7	0.25	1.47	3.24
MWL-16 F	16	11	25	6.30	16.23	2.5	9	0.25	1.47	2.52
MWL-16 G	16	11	25	7.70	19.84	2.5	11	0.25	1.47	2.06
MWL-16 H	16	11	25	9.09	23.44	2.5	13	0.25	1.47	1.74

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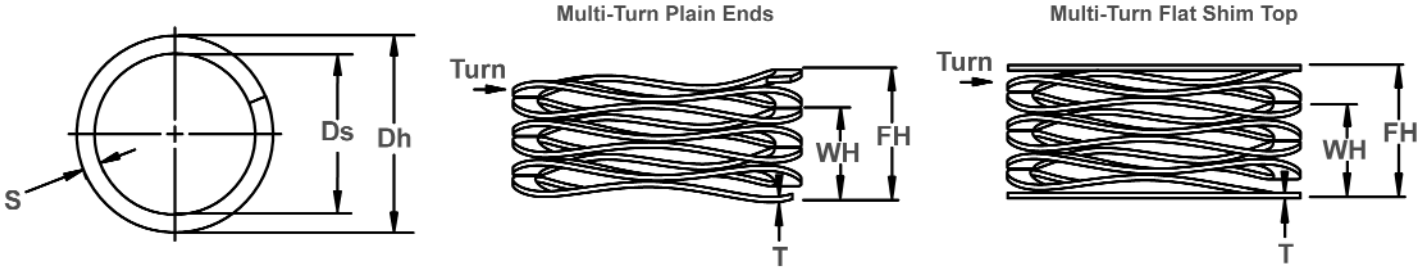

Wave Spring Measurements

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MWM-16 A	16	11	55	3.63	5.41	3.5	3	0.25	1.47	30.93
MWM-16 B	16	11	55	4.83	7.21	3.5	4	0.25	1.47	23.04
MWM-16 C	16	11	55	6.05	9.02	3.5	5	0.25	1.47	18.51
MWM-16 D	16	11	55	7.24	10.82	3.5	6	0.25	1.47	15.36
MWM-16 E	16	11	55	8.46	12.62	3.5	7	0.25	1.47	13.20
MWM-16 F	16	11	55	10.87	16.23	3.5	9	0.25	1.47	10.26
MWM-16 G	16	11	55	13.28	19.84	3.5	11	0.25	1.47	8.39
MWM-16 H	16	11	55	15.70	23.44	3.5	13	0.25	1.47	7.10
MWR-16 A	16	11	90	3.30	5.41	3.5	3	0.30	1.52	42.69
MWR-16 B	16	11	90	4.57	7.21	3.5	4	0.30	1.52	34.07
MWR-16 C	16	11	90	5.59	9.02	3.5	5	0.30	1.52	26.25
MWR-16 D	16	11	90	6.86	10.82	3.5	6	0.30	1.52	22.71
MWR-16 E	16	11	90	7.87	12.62	3.5	7	0.30	1.52	18.95
MWR-16 F	16	11	90	10.16	16.23	3.5	9	0.30	1.52	14.83
MWR-16 G	16	11	90	12.45	19.84	3.5	11	0.30	1.52	12.18
MWR-16 H	16	11	90	14.73	23.44	3.5	13	0.30	1.52	10.33
MWL-18 A	18	13	30	3.63	5.72	3.5	3	0.20	1.80	14.40
MWL-18 B	18	13	30	4.75	7.62	3.5	4	0.20	1.80	10.45
MWL-18 C	18	13	30	5.94	9.53	3.5	5	0.20	1.80	8.38
MWL-18 D	18	13	30	7.14	11.43	3.5	6	0.20	1.80	6.99
MWL-18 E	18	13	30	8.31	13.34	3.5	7	0.20	1.80	5.97
MWL-18 F	18	13	30	10.69	17.15	3.5	9	0.20	1.80	4.65
MWL-18 G	18	13	30	14.25	22.86	3.5	12	0.20	1.80	3.48
MWM-18 A	18	13	55	3.68	5.72	3.5	3	0.25	1.83	27.07
MWM-18 B	18	13	55	4.98	7.62	3.5	4	0.25	1.83	20.82
MWM-18 C	18	13	55	6.22	9.53	3.5	5	0.25	1.83	16.66
MWM-18 D	18	13	55	7.47	11.43	3.5	6	0.25	1.83	13.88
MWM-18 E	18	13	55	8.74	13.34	3.5	7	0.25	1.83	11.96
MWM-18 F	18	13	55	11.23	17.15	3.5	9	0.25	1.83	9.29
MWM-18 G	18	13	55	14.96	22.86	3.5	12	0.25	1.83	6.96
MWR-18 A	18	13	90	3.84	5.72	3.5	3	0.30	1.83	47.88
MWR-18 B	18	13	90	5.13	7.62	3.5	4	0.30	1.83	36.16
MWR-18 C	18	13	90	6.40	9.53	3.5	5	0.30	1.83	28.81
MWR-18 D	18	13	90	7.70	11.43	3.5	6	0.30	1.83	24.10
MWR-18 E	18	13	90	8.97	13.34	3.5	7	0.30	1.83	20.60
MWR-18 F	18	13	90	11.53	17.15	3.5	9	0.30	1.83	16.03
MWR-18 G	18	13	90	15.37	22.86	3.5	12	0.30	1.83	12.01

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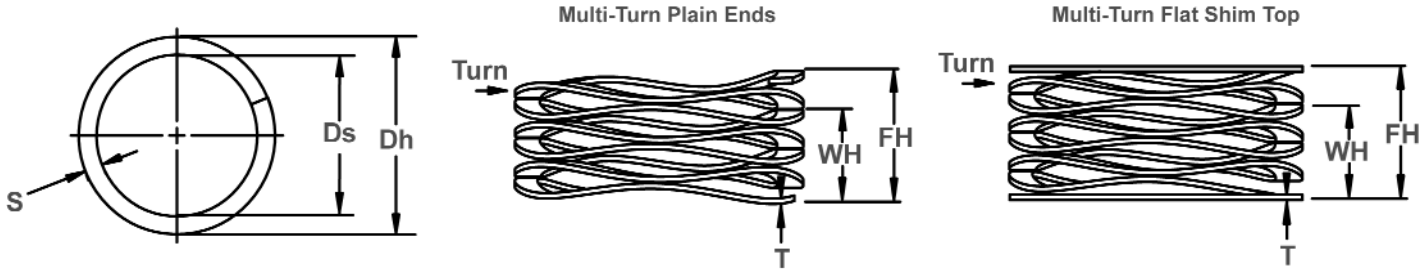

Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER Dh mm	SHAFT DIAMETER CLEARANCE Ds	LOAD (N)	WORK HEIGHT WH	FREE HEIGHT Ref. FH	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS T	SECTION S	SPRING RATE Ref. N/mm
MWL-20 A	20	15	35	2.72	6.32	3.5	3	0.20	1.80	9.70
MWL-20 B	20	15	35	3.61	8.43	3.5	4	0.20	1.80	7.25
MWL-20 C	20	15	35	4.52	10.54	3.5	5	0.20	1.80	5.81
MWL-20 D	20	15	35	5.41	12.65	3.5	6	0.20	1.80	4.83
MWL-20 E	20	15	35	6.32	14.76	3.5	7	0.20	1.80	4.15
MWL-20 F	20	15	35	8.13	18.97	3.5	9	0.20	1.80	3.23
MWL-20 G	20	15	35	10.82	25.30	3.5	12	0.20	1.80	2.42
MWM-20 A	20	14	70	3.05	6.32	3.5	3	0.25	1.98	21.36
MWM-20 B	20	14	70	4.06	8.43	3.5	4	0.25	1.98	16.02
MWM-20 C	20	14	70	5.08	10.54	3.5	5	0.25	1.98	12.82
MWM-20 D	20	14	70	6.27	12.65	3.5	6	0.25	1.98	10.98
MWM-20 E	20	14	70	7.32	14.76	3.5	7	0.25	1.98	9.41
MWM-20 F	20	14	70	9.17	18.97	3.5	9	0.25	1.98	7.14
MWM-20 G	20	14	70	12.22	25.30	3.5	12	0.25	1.98	5.35
MWR-20 A	20	14	100	4.24	6.32	3.5	3	0.33	2.01	48.01
MWR-20 B	20	14	100	5.66	8.43	3.5	4	0.33	2.01	36.12
MWR-20 C	20	14	100	7.06	10.54	3.5	5	0.33	2.01	28.74
MWR-20 D	20	14	100	8.48	12.65	3.5	6	0.33	2.01	24.01
MWR-20 E	20	14	100	9.91	14.76	3.5	7	0.33	2.01	20.61
MWR-20 F	20	14	100	12.73	18.97	3.5	9	0.33	2.01	16.00
MWR-20 G	20	14	100	16.97	25.30	3.5	12	0.33	2.01	12.00
MWL-25 A	25	19	50	2.06	6.63	3.5	3	0.25	2.18	10.94
MWL-25 B	25	19	50	2.74	8.84	3.5	4	0.25	2.18	8.20
MWL-25 C	25	19	50	3.43	11.05	3.5	5	0.25	2.18	6.56
MWL-25 D	25	19	50	4.11	13.26	3.5	6	0.25	2.18	5.47
MWL-25 E	25	19	50	4.80	15.47	3.5	7	0.25	2.18	4.69
MWL-25 F	25	19	50	6.20	19.89	3.5	9	0.25	2.18	3.65
MWL-25 G	25	19	50	8.26	26.52	3.5	12	0.25	2.18	2.74
MWM-25 A	25	19	80	2.95	6.63	3.5	3	0.30	2.39	21.72
MWM-25 B	25	19	80	3.94	8.84	3.5	4	0.30	2.39	16.32
MWM-25 C	25	19	80	4.90	11.05	3.5	5	0.30	2.39	13.01
MWM-25 D	25	19	80	5.89	13.26	3.5	6	0.30	2.39	10.86
MWM-25 E	25	19	80	6.88	15.47	3.5	7	0.30	2.39	9.32
MWM-25 F	25	19	80	8.84	19.89	3.5	9	0.30	2.39	7.24
MWM-25 G	25	19	80	11.79	26.52	3.5	12	0.30	2.39	5.43

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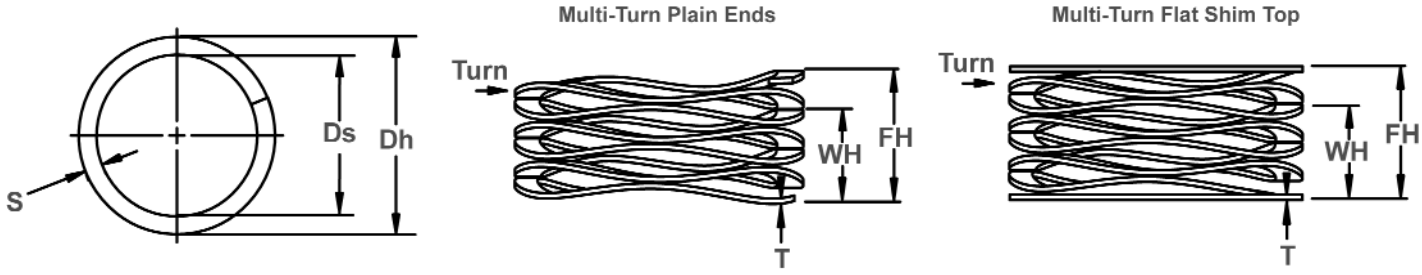

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MWR-25 A	25	19	110	4.04	6.63	3.5	3	0.38	2.39	42.46
MWR-25 B	25	19	110	5.38	8.84	3.5	4	0.38	2.39	31.84
MWR-25 C	25	19	110	6.73	11.05	3.5	5	0.38	2.39	25.47
MWR-25 D	25	19	110	8.08	13.26	3.5	6	0.38	2.39	21.23
MWR-25 E	25	19	110	9.40	15.47	3.5	7	0.38	2.39	18.12
MWR-25 F	25	19	110	12.12	19.89	3.5	9	0.38	2.39	14.15
MWR-25 G	25	19	110	16.15	26.52	3.5	12	0.38	2.39	10.61
MWL-28 A	28	22	50	3.76	7.24	3.5	3	0.30	2.39	14.37
MWL-28 B	28	22	50	5.00	9.65	3.5	4	0.30	2.39	10.76
MWL-28 C	28	22	50	6.27	12.07	3.5	5	0.30	2.39	8.63
MWL-28 D	28	22	50	7.52	14.48	3.5	6	0.30	2.39	7.18
MWL-28 E	28	22	50	8.79	16.89	3.5	7	0.30	2.39	6.17
MWL-28 F	28	22	50	10.03	19.30	3.5	8	0.30	2.39	5.39
MWL-28 G	28	22	50	11.28	21.72	3.5	9	0.30	2.39	4.79
MWL-28 H	28	22	50	13.79	26.54	3.5	11	0.30	2.39	3.92
MWL-28 I	28	22	50	16.31	31.37	3.5	13	0.30	2.39	3.32
MWM-28 A	28	22	80	4.39	7.24	3.5	3	0.38	2.39	28.12
MWM-28 B	28	22	80	5.84	9.65	3.5	4	0.38	2.39	21.00
MWM-28 C	28	22	80	7.32	12.07	3.5	5	0.38	2.39	16.84
MWM-28 D	28	22	80	8.79	14.48	3.5	6	0.38	2.39	14.06
MWM-28 E	28	22	80	10.24	16.89	3.5	7	0.38	2.39	12.02
MWM-28 F	28	22	80	11.71	19.30	3.5	8	0.38	2.39	10.53
MWM-28 G	28	22	80	13.18	21.72	3.5	9	0.38	2.39	9.37
MWM-28 H	28	22	80	16.10	26.54	3.5	11	0.38	2.39	7.66
MWM-28 I	28	22	80	19.02	31.37	3.5	13	0.38	2.39	6.48
MWR-28 A	28	22	130	4.57	7.24	3.5	3	0.46	2.39	48.74
MWR-28 B	28	22	130	6.07	9.65	3.5	4	0.46	2.39	36.30
MWR-28 C	28	22	130	7.59	12.07	3.5	5	0.46	2.39	29.08
MWR-28 D	28	22	130	9.12	14.48	3.5	6	0.46	2.39	24.26
MWR-28 E	28	22	130	10.64	16.89	3.5	7	0.46	2.39	20.81
MWR-28 F	28	22	130	12.17	19.30	3.5	8	0.46	2.39	18.21
MWR-28 G	28	22	130	13.69	21.72	3.5	9	0.46	2.39	16.20
MWR-28 H	28	22	130	16.71	26.54	3.5	11	0.46	2.39	13.23
MWR-28 I	28	22	130	19.76	31.37	3.5	13	0.46	2.39	11.20

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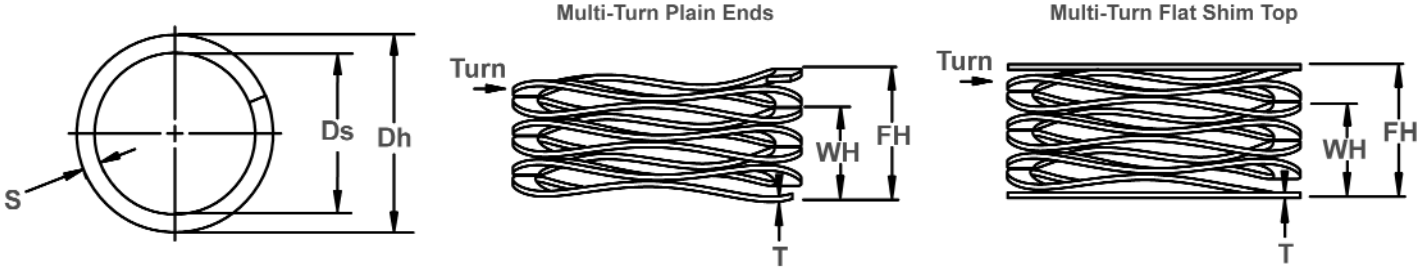
MWL,MWM, MWR Wave Springs

Multi Turn, Metric

Used for low force applications with large deflections: More turns equals less force. Utilizes nearly half the space as helical compression springs while producing the same force.



Wave Spring Measurements

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MWL-30 A	30	24	50	3.18	7.62	3.5	3	0.30	2.39	11.25
MWL-30 B	30	24	50	4.22	10.16	3.5	4	0.30	2.39	8.41
MWL-30 C	30	24	50	5.28	12.70	3.5	5	0.30	2.39	6.74
MWL-30 D	30	24	50	6.32	15.24	3.5	6	0.30	2.39	5.61
MWL-30 E	30	24	50	7.39	17.78	3.5	7	0.30	2.39	4.81
MWL-30 F	30	24	50	8.43	20.32	3.5	8	0.30	2.39	4.21
MWL-30 G	30	24	50	9.50	22.86	3.5	9	0.30	2.39	3.74
MWL-30 H	30	24	50	11.61	27.94	3.5	11	0.30	2.39	3.06
MWL-30 I	30	24	50	13.72	33.02	3.5	13	0.30	2.39	2.59
MWM-30 A	30	24	90	3.51	7.62	3.5	3	0.38	2.39	21.87
MWM-30 B	30	24	90	4.70	10.16	3.5	4	0.38	2.39	16.48
MWM-30 C	30	24	90	5.87	12.70	3.5	5	0.38	2.39	13.17
MWM-30 D	30	24	90	7.04	15.24	3.5	6	0.38	2.39	10.97
MWM-30 E	30	24	90	8.20	17.78	3.5	7	0.38	2.39	9.40
MWM-30 F	30	24	90	9.37	20.32	3.5	8	0.38	2.39	8.22
MWM-30 G	30	24	90	10.54	22.86	3.5	9	0.38	2.39	7.31
MWM-30 H	30	24	90	12.90	27.94	3.5	11	0.38	2.39	5.99
MWM-30 I	30	24	90	15.24	33.02	3.5	13	0.38	2.39	5.06
MWR-30 A	30	24	130	4.19	7.62	3.5	3	0.46	2.39	37.91
MWR-30 B	30	24	130	5.59	10.16	3.5	4	0.46	2.39	28.43
MWR-30 C	30	24	130	6.99	12.70	3.5	5	0.46	2.39	22.75
MWR-30 D	30	24	130	8.38	15.24	3.5	6	0.46	2.39	18.96
MWR-30 E	30	24	130	9.78	17.78	3.5	7	0.46	2.39	16.25
MWR-30 F	30	24	130	11.18	20.32	3.5	8	0.46	2.39	14.22
MWR-30 G	30	24	130	12.57	22.86	3.5	9	0.46	2.39	12.64
MWR-30 H	30	24	130	15.37	27.94	3.5	11	0.46	2.39	10.34
MWR-30 I	30	24	130	18.16	33.02	3.5	13	0.46	2.39	8.75
MWL-35 A	35	27	70	3.94	8.38	3.5	3	0.36	3.18	15.75
MWL-35 B	35	27	70	5.23	11.18	3.5	4	0.36	3.18	11.78
MWL-35 C	35	27	70	6.55	13.97	3.5	5	0.36	3.18	9.44
MWL-35 D	35	27	70	7.87	16.76	3.5	6	0.36	3.18	7.87
MWL-35 E	35	27	70	9.17	19.56	3.5	7	0.36	3.18	6.74
MWL-35 F	35	27	70	10.49	22.35	3.5	8	0.36	3.18	5.90
MWL-35 G	35	27	70	11.81	25.15	3.5	9	0.36	3.18	5.25
MWL-35 H	35	27	70	14.43	30.73	3.5	11	0.36	3.18	4.29
MWL-35 I	35	27	70	17.04	36.32	3.5	13	0.36	3.18	3.63

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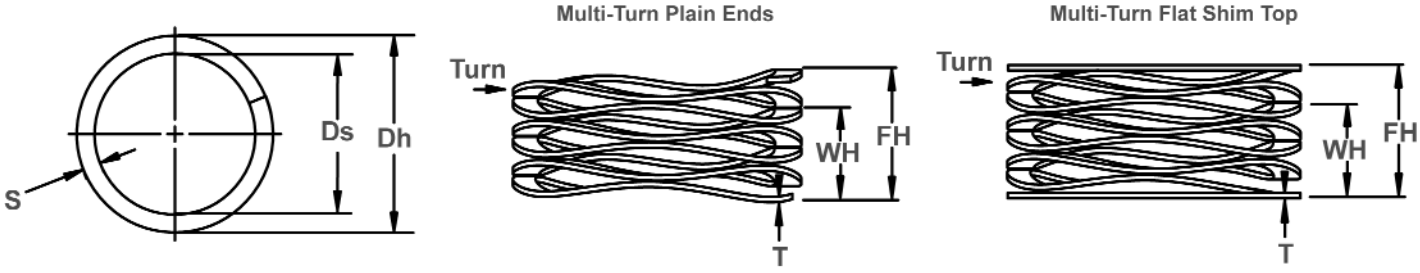

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MWM-35 A	35	27	110	4.14	8.38	3.5	3	0.41	3.38	25.93
MWM-35 B	35	27	110	5.51	11.18	3.5	4	0.41	3.38	19.42
MWM-35 C	35	27	110	6.88	13.97	3.5	5	0.41	3.38	15.52
MWM-35 D	35	27	110	8.26	16.76	3.5	6	0.41	3.38	12.93
MWM-35 E	35	27	110	9.63	19.56	3.5	7	0.41	3.38	11.08
MWM-35 F	35	27	110	11.02	22.35	3.5	8	0.41	3.38	9.71
MWM-35 G	35	27	110	12.40	25.15	3.5	9	0.41	3.38	8.63
MWM-35 H	35	27	110	15.14	30.73	3.5	11	0.41	3.38	7.05
MWM-35 I	35	27	110	17.91	36.32	3.5	13	0.41	3.38	5.97
MWR-35 A	35	27	160	4.04	8.38	3.5	3	0.46	3.38	36.84
MWR-35 B	35	27	160	5.38	11.18	3.5	4	0.46	3.38	27.63
MWR-35 C	35	27	160	6.73	13.97	3.5	5	0.46	3.38	22.10
MWR-35 D	35	27	160	8.08	16.76	3.5	6	0.46	3.38	18.42
MWR-35 E	35	27	160	9.42	19.56	3.5	7	0.46	3.38	15.79
MWR-35 F	35	27	160	10.77	22.35	3.5	8	0.46	3.38	13.81
MWR-35 G	35	27	160	12.12	25.15	3.5	9	0.46	3.38	12.28
MWR-35 H	35	27	160	14.81	30.73	3.5	11	0.46	3.38	10.05
MWR-35 I	35	27	160	17.50	36.32	3.5	13	0.46	3.38	8.50
MWL-40 A	40	30	100	2.90	9.14	3.5	3	0.41	3.38	16.00
MWL-40 B	40	30	100	3.86	12.19	3.5	4	0.41	3.38	12.00
MWL-40 C	40	30	100	4.80	15.24	3.5	5	0.41	3.38	9.58
MWL-40 D	40	30	100	5.77	18.29	3.5	6	0.41	3.38	7.99
MWL-40 E	40	30	100	6.73	21.34	3.5	7	0.41	3.38	6.85
MWL-40 F	40	30	100	7.70	24.38	3.5	8	0.41	3.38	5.99
MWL-40 G	40	30	100	8.66	27.43	3.5	9	0.41	3.38	5.33
MWL-40 H	40	30	100	10.59	33.53	3.5	11	0.41	3.38	4.36
MWL-40 I	40	30	100	12.52	39.62	3.5	13	0.41	3.38	3.69
MWM-40 A	40	30	150	5.44	9.14	3.5	3	0.53	3.63	40.45
MWM-40 B	40	30	150	7.24	12.19	3.5	4	0.53	3.63	30.28
MWM-40 C	40	30	150	9.04	15.24	3.5	5	0.53	3.63	24.20
MWM-40 D	40	30	150	10.85	18.29	3.5	6	0.53	3.63	20.16
MWM-40 E	40	30	150	12.65	21.34	3.5	7	0.53	3.63	17.27
MWM-40 F	40	30	150	14.48	24.38	3.5	8	0.53	3.63	15.14
MWM-40 G	40	30	150	16.28	27.43	3.5	9	0.53	3.63	13.45
MWM-40 H	40	30	150	19.89	33.53	3.5	11	0.53	3.63	11.00
MWM-40 I	40	30	150	23.50	39.62	3.5	13	0.53	3.63	9.30

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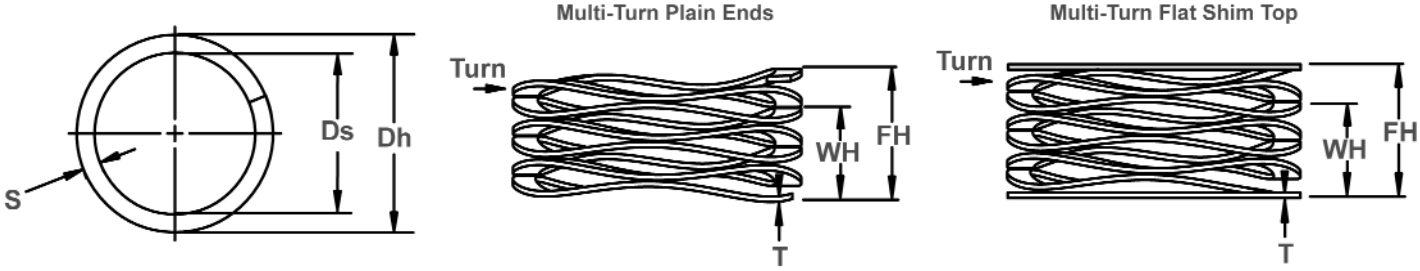

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MWR-40 A	40	30	300	5.66	9.14	4.5	3	0.46	3.38	86.21
MWR-40 B	40	30	300	7.54	12.19	4.5	4	0.46	3.38	64.54
MWR-40 C	40	30	300	9.42	15.24	4.5	5	0.46	3.38	51.58
MWR-40 D	40	30	300	11.33	18.29	4.5	6	0.46	3.38	43.11
MWR-40 E	40	30	300	13.21	21.34	4.5	7	0.46	3.38	36.91
MWR-40 F	40	30	300	15.09	24.38	4.5	8	0.46	3.38	32.27
MWR-40 G	40	30	300	16.97	27.43	4.5	9	0.46	3.38	28.67
MWR-40 H	40	30	300	20.75	33.53	4.5	11	0.46	3.38	23.48
MWR-40 I	40	30	300	24.54	39.62	4.5	13	0.46	3.38	19.88
MWL-45 A	45	35	110	3.38	9.91	3.5	3	0.46	3.63	16.85
MWL-45 B	45	35	110	4.52	13.21	3.5	4	0.46	3.63	12.66
MWL-45 C	45	35	110	5.64	16.51	3.5	5	0.46	3.63	10.12
MWL-45 D	45	35	110	6.76	19.81	3.5	6	0.46	3.63	8.43
MWL-45 E	45	35	110	7.90	23.11	3.5	7	0.46	3.63	7.23
MWL-45 F	45	35	110	9.02	26.42	3.5	8	0.46	3.63	6.32
MWL-45 G	45	35	110	10.16	29.72	3.5	9	0.46	3.63	5.62
MWL-45 H	45	35	110	12.40	36.32	3.5	11	0.46	3.63	4.60
MWL-45 I	45	35	110	14.66	42.93	3.5	13	0.46	3.63	3.89
MWM-45 A	45	35	225	5.33	9.91	4.5	3	0.46	3.63	49.21
MWM-45 B	45	35	225	6.99	13.21	4.5	4	0.46	3.63	36.16
MWM-45 C	45	35	225	9.14	16.51	4.5	5	0.46	3.63	30.55
MWM-45 D	45	35	225	10.80	19.81	4.5	6	0.46	3.63	24.95
MWM-45 E	45	35	225	12.70	23.11	4.5	7	0.46	3.63	21.61
MWM-45 F	45	35	225	14.48	26.42	4.5	8	0.46	3.63	18.85
MWM-45 G	45	35	225	16.26	29.72	4.5	9	0.46	3.63	16.71
MWM-45 H	45	35	225	19.81	36.32	4.5	11	0.46	3.63	13.63
MWM-45 I	45	35	225	23.37	42.93	4.5	13	0.46	3.63	11.50
MWR-45 A	45	35	400	6.43	9.91	4.5	3	0.61	3.76	114.95
MWR-45 B	45	35	400	8.38	13.21	4.5	4	0.61	3.76	82.88
MWR-45 C	45	35	400	11.20	16.51	4.5	5	0.61	3.76	75.35
MWR-45 D	45	35	400	12.95	19.81	4.5	6	0.61	3.76	58.33
MWR-45 E	45	35	400	15.37	23.11	4.5	7	0.61	3.76	51.63
MWR-45 F	45	35	400	17.27	26.42	4.5	8	0.61	3.76	43.74
MWR-45 G	45	35	400	19.68	29.72	4.5	9	0.61	3.76	39.87
MWR-45 H	45	35	400	24.26	36.32	4.5	11	0.61	3.76	33.15
MWR-45 I	45	35	400	28.45	42.93	4.5	13	0.61	3.76	27.63

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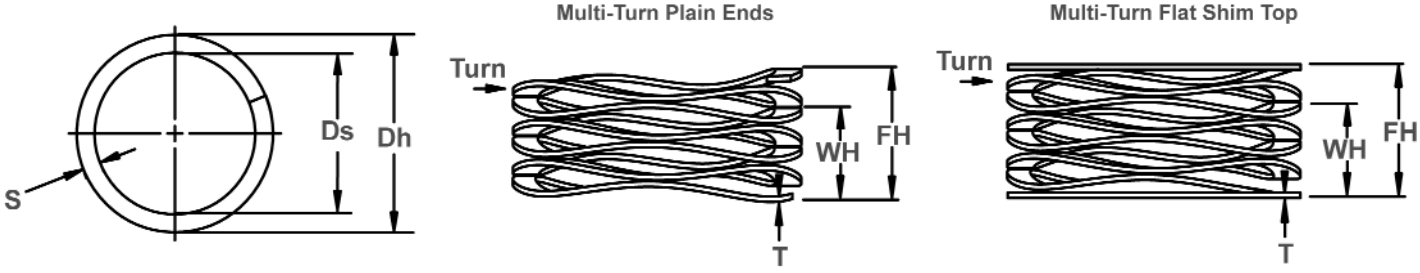
FOR FLAT SHIM TOP WAVE SPRINGS, ADD AN 'F' TO THE END OF THE PART NUMBER (i.e. MWL-8ST AF, MWM-10ST BF, MWR-14ST CF, ETC.)

MATERIAL CODES: ST = CARBON STEEL. SQ = 17-7 PH/C STAINLESS STEEL. SPECIAL ALLOYS AVAILABLE UPON REQUEST.



Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER Dh mm	SHAFT DIAMETER CLEARANCE Ds	LOAD (N)	WORK HEIGHT WH	FREE HEIGHT Ref. FH	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS T	SECTION S	SPRING RATE Ref. N/mm
MWL-50 A	50	40	110	4.83	10.29	3.5	3	0.53	3.63	20.14
MWL-50 B	50	40	110	6.10	13.72	3.5	4	0.53	3.63	14.44
MWL-50 C	50	40	110	7.87	17.15	3.5	5	0.53	3.63	11.86
MWL-50 D	50	40	110	9.40	20.57	3.5	6	0.53	3.63	9.84
MWL-50 E	50	40	110	11.30	24.00	3.5	7	0.53	3.63	8.66
MWL-50 F	50	40	110	12.70	27.43	3.5	8	0.53	3.63	7.47
MWL-50 G	50	40	110	14.99	30.86	3.5	9	0.53	3.63	6.93
MWL-50 H	50	40	110	18.16	37.72	3.5	11	0.53	3.63	5.62
MWL-50 I	50	40	110	21.34	44.58	3.5	13	0.53	3.63	4.73
MWL-50 J	50	40	110	24.64	51.44	3.5	15	0.53	3.63	4.10
MWM-50 A	50	40	225	4.62	10.29	4.5	3	0.46	3.63	39.72
MWM-50 B	50	40	225	6.35	13.72	4.5	4	0.46	3.63	30.55
MWM-50 C	50	40	225	7.49	17.15	4.5	5	0.46	3.63	23.31
MWM-50 D	50	40	225	8.89	20.57	4.5	6	0.46	3.63	19.26
MWM-50 E	50	40	225	10.54	24.00	4.5	7	0.46	3.63	16.71
MWM-50 F	50	40	225	11.89	27.43	4.5	8	0.46	3.63	14.47
MWM-50 G	50	40	225	13.59	30.86	4.5	9	0.46	3.63	13.03
MWM-50 H	50	40	225	16.71	37.72	4.5	11	0.46	3.63	10.71
MWM-50 I	50	40	225	19.61	44.58	4.5	13	0.46	3.63	9.01
MWM-50 J	50	40	225	22.48	51.44	4.5	15	0.46	3.63	7.77
MWR-50 A	50	40	400	5.92	10.29	4.5	3	0.61	3.76	91.56
MWR-50 B	50	40	400	7.80	13.72	4.5	4	0.61	3.76	67.59
MWR-50 C	50	40	400	10.16	17.15	4.5	5	0.61	3.76	57.27
MWR-50 D	50	40	400	11.79	20.57	4.5	6	0.61	3.76	45.51
MWR-50 E	50	40	400	14.15	24.00	4.5	7	0.61	3.76	40.59
MWR-50 F	50	40	400	15.62	27.43	4.5	8	0.61	3.76	33.87
MWR-50 G	50	40	400	17.91	30.86	4.5	9	0.61	3.76	30.88
MWR-50 H	50	40	400	21.54	37.72	4.5	11	0.61	3.76	24.72
MWR-50 I	50	40	400	25.65	44.58	4.5	13	0.61	3.76	21.14
MWR-50 J	50	40	400	29.21	51.44	4.5	15	0.61	3.76	18.00
MWL-55 A	55	45	125	5.59	11.05	3.5	3	0.61	3.76	22.89
MWL-55 B	55	45	125	7.72	14.73	3.5	4	0.61	3.76	17.83
MWL-55 C	55	45	125	9.68	18.41	3.5	5	0.61	3.76	14.31
MWL-55 D	55	45	125	11.48	22.1	3.5	6	0.61	3.76	11.77
MWL-55 E	55	45	125	13.92	25.78	3.5	7	0.61	3.76	10.54
MWL-55 F	55	45	125	15.52	29.46	3.5	8	0.61	3.76	8.96
MWL-55 G	55	45	125	18.41	33.15	3.5	9	0.61	3.76	8.48
MWL-55 H	55	45	125	21.67	40.51	3.5	11	0.61	3.76	6.63
MWL-55 I	55	45	125	25.65	47.88	3.5	13	0.61	3.76	5.62
MWL-55 J	55	45	125	29.77	55.25	3.5	15	0.61	3.76	4.91
MWM-55 A	55	45	250	3.1	11.05	4.5	3	0.46	3.63	31.45
MWM-55 B	55	45	250	4.11	14.73	4.5	4	0.46	3.63	23.55
MWM-55 C	55	45	250	5.16	18.41	4.5	5	0.46	3.63	18.86
MWM-55 D	55	45	250	6.2	22.1	4.5	6	0.46	3.63	15.72
MWM-55 E	55	45	250	7.21	25.78	4.5	7	0.46	3.63	13.46

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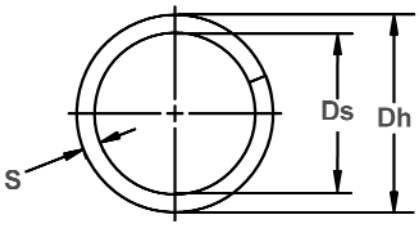
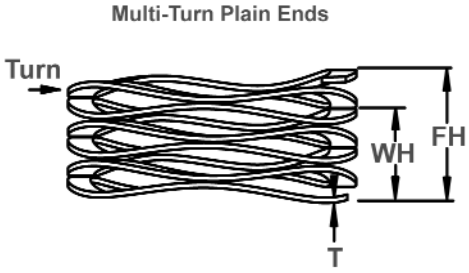
MWL,MWM, MWR Wave Springs

Multi Turn, Metric

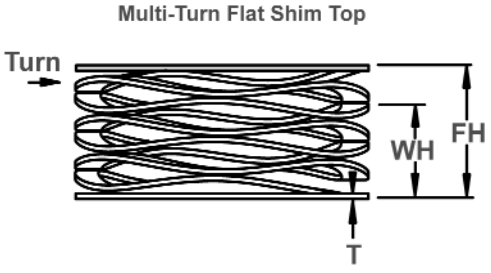
Used for low force applications with large deflections: More turns equals less force. Utilizes nearly half the space as helical compression springs while producing the same force.



Multi-Turn Plain Ends



Multi-Turn Flat Shim Top



Wave Spring Measurements

WAVE SPRING NO.	HOUSING DIAMETER Dh mm	SHAFT DIAMETER CLEARANCE Ds	LOAD (N)	WORK HEIGHT WH	FREE HEIGHT Ref. FH	NUMBER OF WAVES	NUMBER OF TURNS	THICKNESS T	SECTION S	SPRING RATE Ref. N/mm
MWM-55 F	55	45	250	8.26	29.46	4.5	8	0.46	3.63	11.79
MWM-55 G	55	45	250	9.27	33.15	4.5	9	0.46	3.63	10.47
MWM-55 H	55	45	250	11.33	40.51	4.5	11	0.46	3.63	8.57
MWM-55 I	55	45	250	13.41	47.88	4.5	13	0.46	3.63	7.25
MWM-55 J	55	45	250	15.47	55.25	4.5	15	0.46	3.63	6.29
MWR-55 A	55	45	400	5.31	11.05	4.5	3	0.61	3.76	69.68
MWR-55 B	55	45	400	7.24	14.73	4.5	4	0.61	3.76	53.38
MWR-55 C	55	45	400	9.09	18.41	4.5	5	0.61	3.76	42.91
MWR-55 D	55	45	400	10.64	22.1	4.5	6	0.61	3.76	34.92
MWR-55 E	55	45	400	12.24	25.78	4.5	7	0.61	3.76	29.55
MWR-55 F	55	45	400	14.1	29.46	4.5	8	0.61	3.76	26.03
MWR-55 G	55	45	400	15.82	33.15	4.5	9	0.61	3.76	23.09
MWR-55 H	55	45	400	19.3	40.51	4.5	11	0.61	3.76	18.86
MWR-55 I	55	45	400	23.11	47.88	4.5	13	0.61	3.76	16.15
MWR-55 J	55	45	400	26.54	55.25	4.5	15	0.61	3.76	13.94
MWL-60 A	60	50	135	5.59	11.43	4.5	3	0.46	3.63	23.11
MWL-60 B	60	50	135	7.47	15.24	4.5	4	0.46	3.63	17.37
MWL-60 C	60	50	135	9.32	19.05	4.5	5	0.46	3.63	13.88
MWL-60 D	60	50	135	11.2	22.86	4.5	6	0.46	3.63	11.58
MWL-60 E	60	50	135	13.06	26.67	4.5	7	0.46	3.63	9.92
MWL-60 F	60	50	135	14.94	30.48	4.5	8	0.46	3.63	8.68
MWL-60 G	60	50	135	16.79	34.29	4.5	9	0.46	3.63	7.71
MWL-60 H	60	50	135	20.52	41.91	4.5	11	0.46	3.63	6.31
MWL-60 I	60	50	135	24.26	49.53	4.5	13	0.46	3.63	5.34
MWL-60 J	60	50	135	27.99	57.15	4.5	15	0.46	3.63	4.63
MWM-60 A	60	50	275	6.65	11.43	4.5	3	0.61	3.76	57.59
MWM-60 B	60	50	275	8.86	15.24	4.5	4	0.61	3.76	43.13
MWM-60 C	60	50	275	11.07	19.05	4.5	5	0.61	3.76	34.48
MWM-60 D	60	50	275	13.28	22.86	4.5	6	0.61	3.76	28.72
MWM-60 E	60	50	275	15.49	26.67	4.5	7	0.61	3.76	24.61
MWM-60 F	60	50	275	17.7	30.48	4.5	8	0.61	3.76	21.52
MWM-60 G	60	50	275	19.94	34.29	4.5	9	0.61	3.76	19.16
MWM-60 H	60	50	275	24.36	41.91	4.5	11	0.61	3.76	15.67
MWM-60 I	60	50	275	28.78	49.53	4.5	13	0.61	3.76	13.25
MWM-60 J	60	50	275	33.22	57.15	4.5	15	0.61	3.76	11.49
MWR-60 A	60	50	450	7.75	11.43	4.5	3	0.76	4.01	122.18
MWR-60 B	60	50	450	10.31	15.24	4.5	4	0.76	4.01	91.32
MWR-60 C	60	50	450	12.9	19.05	4.5	5	0.76	4.01	73.21
MWR-60 D	60	50	450	15.47	22.86	4.5	6	0.76	4.01	60.88
MWR-60 E	60	50	450	18.06	26.67	4.5	7	0.76	4.01	52.26
MWR-60 F	60	50	450	20.62	30.48	4.5	8	0.76	4.01	45.66
MWR-60 G	60	50	450	23.22	34.29	4.5	9	0.76	4.01	40.63
MWR-60 H	60	50	450	28.37	41.91	4.5	11	0.76	4.01	33.24
MWR-60 I	60	50	450	33.53	49.53	4.5	13	0.76	4.01	28.12
MWR-60 J	60	50	450	38.68	57.15	4.5	15	0.76	4.01	24.37

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