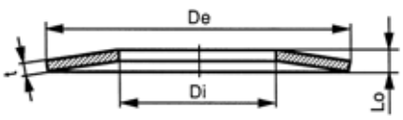
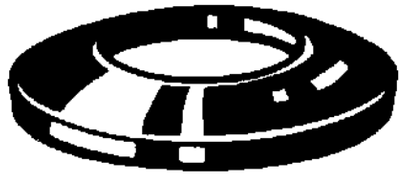
Disc spring for critical applications type B (medium)

DIN 2093 B



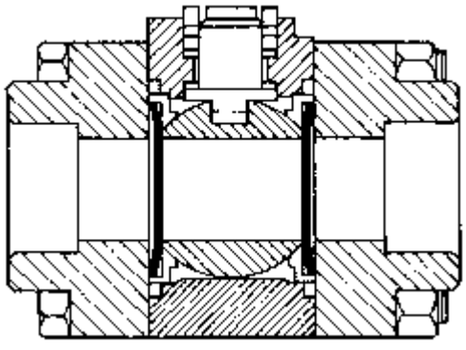


Technical data

De (h12)	D_i (H12)	t	Lo	F
8	4,2	0,3	0,55	119
10	5,2	0,4	0,7	213
12,5	6,2	0,5	0,85	291
14	7,2	0,5	0,9	279
16	8,2	0,6	1,05	412
18	9,2	0,7	1,2	572
20	10,2	0,8	1,35	745
22,5	11,2	0,8	1,45	710
25	12,2	0,9	1,6	868
28	14,2	1	1,8	1110
31,5	16,3	1,25	2,15	1920
35,5	18,3	1,25	2,25	1700
40	20,4	1,5	2,65	2620
45	22,4	1,75	3,05	3660
50	25,4	2	3,4	4760
56	28,5	2	3,6	4440
63	31	2,5	4,25	7180
71	36	2,5	4,5	6730
80	41	3	5,3	10500
90	46	3,5	6	14200
100	51	3,5	6,3	13100
112	57	4	7,2	17800

- Disc springs acc. to DIN 2093 are mostly used in critical applications with safety first. Similar applications can be found in for example safety torque limiter clutches, hinge stiffeners and applications of constant roll pressure. Because of the right combination c.q. stacking of the disc springs the elasticity and/or deflection can be dosed accurately. The technical specifications of the disc springs above meet the highest expectations with reference to the static and dynamic load. They exceed the requirements of DIN 2093.
- Material group 1: t < 1,25 from steel Ck 75.
- Material group 2: 1,25 ≤ t ≤ 6,0 from steel 50 Cr V4 (fatique fractures can be largely prevented because these disc springs have machined edges).
- F = spring force in Newton at a deflection s ≈ 0,75 h_o ($h_o = L_o - t$).
- Nominal thickness. For the calculation of disc springs, see DIN 2092.
- Extensive technical data available on request.

Example of application



Ball valve

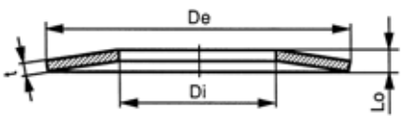
36302 Disc spring for critical applications type B (medium) L07C

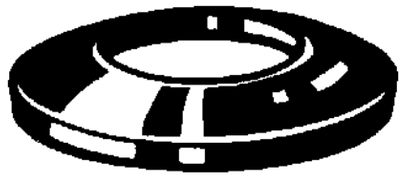
Material Steel Ck 75 Werkstoffnr. 1.1248
Surface treatment Phosphated
Packaging Standard

De x Di x t	✉	Art.number	De x Di x t	✉	Art.number	De x Di x t	✉	Art.number
8X4,2X0,3MM	100	36302.084.003	25X12,2X0,9MM	50	36302.262.009	63X31X2,5MM	5	36302.661.025
10X5,2X0,4MM	100	36302.105.004	28X14,2X1MM	50	36302.294.010	71X36X2,5MM	5	36302.746.025
12,5X6,2X0,5MM	100	36302.131.005	31,5X16,3X1,25MM	50	36302.331.012	80X41X3MM	1	36302.841.030
14X7,2X0,5MM	100	36302.147.005	35,5X18,3X1,25MM	25	36302.373.012	90X46X3,5MM	1	36302.946.035
16X8,2X0,6MM	100	36302.168.006	40X20,4X1,5MM	25	36302.420.015	100X51X3,5MM	1	36302.960.035
18X9,2X0,7MM	100	36302.189.007	45X22,4X1,75MM	10	36302.472.017	112X57X4MM	1	36302.968.040
20X10,2X0,8MM	50	36302.210.008	50X25,4X2MM	10	36302.525.020			
22,5X11,2X0,8MM	50	36302.236.008	56X28,5X2MM	10	36302.588.020			

Disc spring for critical applications type C (light)

DIN 2093 C



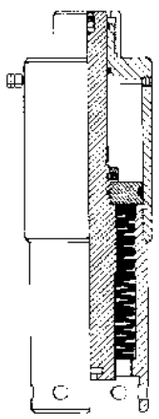


Technical data

De (h12)	D_i (H12)	t	Lo	F
8	4,2	0,2	0,45	39
10	5,2	0,25	0,55	58
12,5	6,2	0,35	0,8	152
14	7,2	0,35	0,8	123
16	8,2	0,4	0,9	155
18	9,2	0,45	1,05	214
20	10,2	0,5	1,15	254
22,5	11,2	0,6	1,4	425
25	12,2	0,7	1,6	601
28	14,2	0,8	1,8	801
31,5	16,3	0,8	1,85	687
35,5	18,3	0,9	2,05	831
40	20,4	1	2,3	1020
45	22,4	1,25	2.85	1890
50	25,4	1,25	2,85	1550
56	28,5	1,5	3,45	2620
63	31	1,8	4,15	4240
71	36	2	4,6	5140
80	41	2,25	5,2	6610
90	46	2,5	5,7	7680
100	51	2,7	6,2	8610
112	57	3	6,9	10500
125	64	3,5	8	15400

- Disc springs acc. to DIN 2093 are mostly used in critical applications with safety first. Similar applications can be found in for example safety torque limiter clutches, hinge stiffeners and applications of constant roll pressure. Because of the right combination c.q. stacking of the disc springs the elasticity and/or deflection can be dosed accurately. The technical specifications of the disc springs above meet the highest expectations with reference to the static and dynamic load. They exceed the requirements of DIN 2093.
- Material group 1: t < 1,25 from steel Ck 75.
- Material group 2: 1,25 ≤ t ≤ 6,0 from steel 50 Cr V4 (fatique fractures can be largely prevented because these disc springs have machined edges).
- F = spring force in Newton at a deflection s ≈ 0,75 h_o ($h_o = L_o - t$).
- For the calculation of disc springs, see DIN 2092.
- Extensive technical data available on request.

Example of application

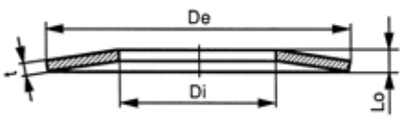


36303 Disc spring for critical applications type C (light) **L07C**

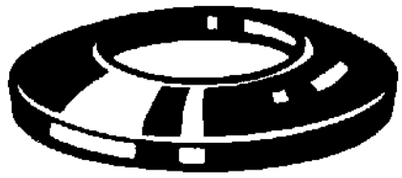
Material Steel Ck 75 Werkstoffnr. 1.1248
Surface treatment Phosphated
Packaging Standard

De x Di x t	✉	Art.number	De x Di x t	✉	Art.number	De x Di x t	✉	Art.number
8X4,2X0,2MM	100	36303.084.002	25X12,2X0,7MM	50	36303.262.007	63X31X1,8MM	5	36303.661.018
10X5,2X0,25MM	100	36303.105.002	28X14,2X0,8MM	50	36303.294.008	71X36X2MM	5	36303.746.020
12,5X6,2X0,35MM	100	36303.131.003	31,5X16,3X0,8MM	50	36303.331.008	80X41X2,25MM	1	36303.841.022
14X7,2X0,35MM	100	36303.147.003	35,5X18,3X0,9MM	25	36303.373.009	90X46X2,5MM	1	36303.946.025
16X8,2X0,4MM	100	36303.168.004	40X20,4X1MM	25	36303.420.010	100X51X2,7MM	1	36303.960.027
18X9,2X0,45MM	100	36303.189.004	45X22,4X1,25MM	10	36303.472.012	112X57X3MM	1	36303.968.030
20X10,2X0,5MM	50	36303.210.005	50X25,4X1,25MM	10	36303.525.012	125X64X3,5MM	1	36303.970.035
22,5X11,2X0,6MM	50	36303.236.006	56X28,5X1,5MM	10	36303.588.015			

Disc spring



DIN 2093
NF E25-104



Technical data

De (h12)	D_i (H12)	t	Lo	F	Type
6	3,2	0,3	0,45	119	-
8	3,2	0,2	0,4	26	-
8	3,2	0,3	0,55	104	-
8	3,2	0,4	0,6	185	-
8	3,2	0,5	0,7	357	-
8	4,2	0,2	0,45	39	C
8	4,2	0,3	0,55	118	B
8	4,2	0,4	0,6	209	A
10	3,2	0,3	0,65	98	-
10	3,2	0,4	0,7	179	-
10-	3,2	0,5	0,75	278	-
10	4,2	0,4	0,7	189	-
10	4,2	0,5	0,75	294	-
10	5,2	0,25	0,55	58	C
10	5,2	0,4	0,7	209	B
10	5,2	0,5	0,75	325	A
12	4,2	0,4	0,8	178	-
12	4,2	0,5	0,85	284	-
12	5,2	0,5	0,9	349	-
12	5,2	0,6	0,95	506	-
12	6,2	0,5	0,85	326	-
12	6,2	0,6	0,95	551	-
12,5	5,2	0,5	0,85	272	-
12,5	6,2	0,35	0,8	151	C
12,5	6,2	0,5	0,85	293	B
12,5	6,2	0,7	1	659	A
14	7,2	0,35	0,8	123	C
14	7,2	0,5	0,9	279	B
14	7,2	0,8	1,1	796	A
15	5,2	0,5	1	278	-
15	5,2	0,6	1,05	407	-
15	5,2	0,7	1,1	555	-
15	6,2	0,5	1	289	-
15	6,2	0,6	1,05	423	-
15	6,2	0,7	1,1	577	-
15	8,2	0,7	1,1	665	-
15	8,2	0,8	1,2	982	-
16	8,2	0,4	0,9	154	C
16	8,2	0,6	1,05	410	B
16	8,2	0,9	1,25	1012	A
18	6,2	0,4	1	139	-
18	6,2	0,5	1,1	245	-
18	6,2	0,6	1,2	400	-
18	6,2	0,7	1,25	552	-
18	6,2	0,8	1,3	725	-
18	8,2	0,5	1,1	265	-
18	8,2	0,7	1,25	596	-
18	8,2	0,8	1,3	782	-
18	8,2	1	1,5	1501	-
18	9,2	0,45	1,05	214	C
18	9,2	0,7	1,2	566	B
18	9,2	1	1,4	1253	A
20	8,2	0,6	1,3	412	-
20	8,2	0,7	1,35	568	-
20	8,2	0,8	1,4	751	-
20	8,2	0,9	1,45	953	-
20	8,2	1	1,55	1294	-
20	10,2	0,5	1,15	254	C
20	10,2	0,8	1,35	748	B

De (h12)	D_i (H12)	t	Lo	F	Type
20	10,2	0,9	1,45	1049	-
20	10,2	1	1,55	1424	-
20	10,2	1,1	1,55	1520	A
20	10,2	1,25	1,75	2475	-
20-	10,2	1,5	2	4255	-
22,5	11,2	0,6	1,4	425	C
22,5	11,2	0,8	1,45	707	B
22,5	11,2	1,25	1,75	1928	A
23	8,2	0,7	1,5	543	-
23	8,2	0,8	1,55	718	-
23	8,2	0,9	1,6	918	-
23	8,2	1	1,7	1239	-
23	10,2	0,9	1,65	1057	-
23	10,2	1	1,7	1315	-
23	12,2	1,25	1,85	2330	-
23	12,2	1,5	2	3295	-
25	12,2	0,7	1,6	569	C
25	12,2	0,9	1,6	862	B
25	12,2	1	1,8	1358	-
25	12,2	1,25	1,95	2213	-
25	12,2	1,5	2,05	2924	A
28	10,2	0,8	1,75	661	-
28	10,2	1	1,9	1129	-
28	10,2	1,25	2,05	1852	-
28	10,2	1,5	2,2	2721	-
28	12,2	1	1,95	1267	-
28	12,2	1,25	2,1	2081	-
28	12,2	1,5	2,25	3075	-
28	14,2	0,8	1,8	801	C
28	14,2	1	1,8	1107	B
28	14,2	1,25	2,1	2238	-
28	14,2	1,5	2,15	2839	A
31,5	12,2	1	2,1	1170	-
31,5	12,2	1,25	2,2	1805	-
31,5	12,2	1,5	2,35	2690	-
31,5	16,3	0,8	1,85	687	C
31,5	16,3	1,25	2,15	1912	B
31,5	16,3	1,5	2,4	3228	-
31,5	16,3	1,75	2,45	3859	A
31,5	16,3	2	2,75	6170	-
34	12,2	1	2,25	1172	-
34	12,2	1,25	2,35	1814	-
34	12,2	1,5	2,5	2719	-
34	14,2	1,25	2,4	1988	-
34	14,2	1,5	2,55	2982	-
34	16,3	1,5	2,55	3153	-
34	16,3	2	2,85	5779	-
35,5	18,3	0.9	2,05	832	C
35,5	18,3	1,25	2,5	1698	B
35,5-2	18,3	2	2,8	5184	A
40	14,2	1,25	2,65	1779	-
40	14,3	1,5	2,75	2544	-
40	14,2	2	3,05	4766	-
40	16,3	1,5	2,8	2748	-
40	16,3	2	3,1	5166	-
40	20,4	1	2,3	1016	C
40	20,4	1,5	2,65	2620	B
40	20,4	2	3,1	5698	-
40	20,4	2,25	3,15	6497	A
40	20,4	2,5	3,45	9384	-
45	22,4	1,25	2,85	1890	C
45	22,4	1,75	3,05	3644	B
45	22,4	2,5	3,5	7712	A
50	18,4	2	3,5	4564	-
50	20,4	2	3,5	4685	-
50	22,4	2	3,6	5219	-
50-3	22,4	2,5	3,9	8505	-
50	25,4	1,25	2,85	1549	C
50	25,4	2	3,4	4760	B
50	25,4	2,5	3,9	9058	-
50	25,4	3	4,1	11970	A
56	28,5	1,5	3,45	2621	C

De (h12)	D_i (H12)	t	Lo	F	Type
56	28,5	2	3,6	4436	B
56	28,5	3	4,3	11382	A
60	20,4	2,5	4,3	7293	-
60	20,4	3	4,7	11569	-
60	25,4	2,5	4,4	8159	-
60	25,4	3	4,65	11762	-
60	30,5	2,5	4,5	9430	-
60	30,5	3	4,7	13219	-
60	30,5	3,5	5	18143	-
63	31	1,8	4,15	4236	C
63	31	2,5	4,25	7185	B
63	31	3,5	4,9	15017	A
70	25,5	2	4,5	4435	-
70	30,5	3	5,1	11420	-
70	35,5	3	5,1	12281	-
70	35,5	4	5,8	23923	-
70	40,5	4	5,6	23338	-
70	40,5	5	6,2	33653	-
71	36	2	4,6	5141	C
71	36	2,5	4,5	6722	B
71	36	4	5,6	20524	A
80	31	3	5,5	10346	-
80	36	3	5,7	11912	-
80	36	4	6,2	21388	-
80	41	2,25	5,2	6609	C
80	41	3	5,3	10512	B
80	41	4	6,2	22861	-
80	41	5	6,7	33541	A
90	46	2,5	5,7	7680	C
90	46	3,5	6	14153	B
90	46	5	7	31337	A
100	41	4	7,2	20240	-
100	51	2,7	6,2	8604	C
100	51	3,5	6,3	13063	B
100	51	5	7,8	36319	-
100	51	6	8,2	47995	A
112	57	4	7,2	17743	B
112	57	6	8,5	43683	A

- The disc springs mentioned above acc. to ≈ DIN 2093 are suitable for general use. For more critical applications it is advised to choose disc springs from the article groups 36300, 36302, 36303 and 36450.
- Group 1: t < 1,25 from steel CS70 acc. to BS 1449-1.
- Group 2: 1,25 ≤ t ≤ 6,0 from steel 50 Cr V4 (edges of these disc springs are not machined).
- F = spring force in Newton at a deflection s ≈ 0,75 h_o (h_o = L_o - t).
- Type A: execution heavy (D_e/t ≈ 18).
- Type B: execution medium (D_e/t ≈ 28).
- Type C: execution light (D_e/t ≈ 40).
- If the type is not mentioned, the concerning dimension is not DIN standardised.
- For the calculation of disc springs, see DIN 2092.

36307 Disc spring **L07C**

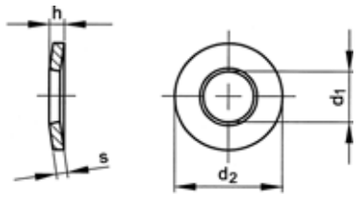
Material Steel CS 70 acc. BS 1449-1
Surface treatment Phosphated
Packaging Standard

De x Di x t	✉	Art.number	De x Di x t	✉	Art.number	De x Di x t	✉	Art.number
6x3,2x0,3MM	100	36307.063.003				14x7,2x0,8MM	100	36307.147.008
8x3,2x0,2MM	100	36307.083.002	12x4,2x0,4MM	100	36307.124.004			
8x3,2x0,3MM	100	36307.083.003	12x4,2x0,5MM	100	36307.124.005	15x5,2x0,5MM	100	36307.155.005
8x3,2x0,4MM	100	36307.083.004	12x5,2x0,5MM	100	36307.125.005	15x5,2x0,6MM	100	36307.155.006
8x3,2x0,5MM	100	36307.083.005	12x5,2x0,6MM	100	36307.125.006	15x5,2x0,7MM	100	36307.155.007
8x4,2x0,2MM	100	36307.084.002	12x6,2x0,5MM	100	36307.126.005	15x6,2x0,5MM	100	36307.156.005
8x4,2x0,3MM	100	36307.084.003	12x6,2x0,6MM	100	36307.126.006	15x6,2x0,6MM	100	36307.156.006
8x4,2x0,4MM	100	36307.084.004				15x6,2x0,7MM	100	36307.156.007
			12,5X5,2X0,5	100	36307.130.005	15x8,2x0,7MM	100	36307.158.007
10x3,2x0,4MM	100	36307.103.004	12,5x6,2x0,35MM	100	36307.131.003	15x8,2x0,8MM	100	36307.158.008
10x3,2x0,5MM	100	36307.103.005	12,5x6,2x0,5MM	100	36307.131.005			
10x4,2x0,4MM	100	36307.104.004	12,5x6,2x0,7MM	100	36307.131.007	16x8,2x0,4MM	100	36307.168.004
10x4,2x0,5MM	100	36307.104.005				16x8,2x0,6MM	100	36307.168.006
10x5,2x0,25MM	100	36307.105.002	14X7,2x0,35MM	100	36307.147.003	16x8,2x0,9MM	100	36307.168.009
10x5,2x0,4MM	100	36307.105.004	14x7,2x0,5MM	100	36307.147.005			
10x5,2x0,5MM	100	36307.105.005						

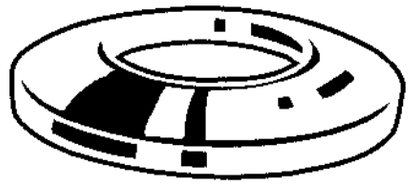
36307 Disc spring

De x Di x t	✉	Art.number
18x6,2x0,4MM	100	36307.186.004
18x6,2x0,5MM	100	36307.186.005
18x6,2x0,6MM	100	36307.186.006
18x6,2x0,7MM	100	36307.186.007
18x6,2x0,8MM	100	36307.186.008
18x8,2x0,5MM	100	36307.188.005
18x8,2x0,7MM	100	36307.188.007
18x8,2x0,8MM	100	36307.188.008
18x8,2x1MM	100	36307.188.010
18x9,2x0,45MM	100	36307.189.004
18x9,2x0,7MM	100	36307.189.007
18x9,2x1MM	100	36307.189.010
20x8,2x0,6MM	50	36307.208.006
20x8,2x0,7MM	50	36307.208.007
20x8,2x0,8MM	50	36307.208.008
20x8,2x0,9MM	50	36307.208.009
20x8,2x1MM	50	36307.208.010
20x10,2x0,5MM	50	36307.210.005
20x10,2x0,8MM	50	36307.210.008
20x10,2x0,9MM	50	36307.210.009
20x10,2x1MM	50	36307.210.010
20x10,2x1,1MM	50	36307.210.011
20x10,2x1,25MM	50	36307.210.012
20x10,2x1,5MM	50	36307.210.015
22,5x11,2x0,6MM	50	36307.236.006
22,5x11,2x0,8MM	50	36307.236.008
22,5x11,2x1,25MM	50	36307.236.012
23x8,2x0,7MM	50	36307.238.007
23x8,2x0,8MM	50	36307.238.008
23x8,2x0,9MM	50	36307.238.009
23x8,2x1MM	50	36307.238.010
23x10,2x0,9MM	50	36307.240.009
23x10,2x1MM	50	36307.240.010
23x12,2x1,25MM	50	36307.242.012
23x12,2x1,5MM	50	36307.242.015
25x12,2x0,7MM	50	36307.262.007
25x12,2x0,9MM	50	36307.262.009
25x12,2x1,25MM	50	36307.262.012
25x12,2x1,5MM	50	36307.262.015
28x10,2x0,8MM	50	36307.290.008
28x10,2x1MM	50	36307.290.010
28x10,2x1,25MM	50	36307.290.012
28x10,2x1,5MM	50	36307.290.015
28x12,2x1MM	50	36307.292.010
28x12,2x1,25MM	50	36307.292.012
28x12,2x1,5MM	50	36307.292.015
28x14,2x0,8MM	50	36307.294.008
28x14,2x1MM	50	36307.294.010
28x14,2x1,25MM	50	36307.294.012
28x14,2x1,5MM	50	36307.294.015
31,5x12,2x1MM	50	36307.327.010
31,5x12,2x1,25MM	50	36307.327.012
31,5x12,2x1,5MM	50	36307.327.015
31,5x16,3x0,8MM	50	36307.331.008
31,5x16,3x1,25MM	50	36307.331.012
31,5x16,3x1,5MM	50	36307.331.015
31,5x16,3x1,75MM	50	36307.331.017
31,5x16,3x2MM	50	36307.331.020
34x12,2x1MM	25	36307.352.010
34x12,2x1,25MM	25	36307.352.012
34x12,2x1,5MM	25	36307.352.015
34X1x,2x1,25MM	25	36307.354.012
34x14,2x1,5MM	25	36307.354.015
34x16,3x1,5MM	25	36307.356.015
34x16,3x2MM	25	36307.356.020
35,5x18,3x0,9M	25	36307.373.009
35,5x18,3x1,25MM	25	36307.373.012
35,5x18,3x2MM	25	36307.373.020
40x14,2x1,25MM	25	36307.414.012
40x14,3x1,5MM	25	36307.414.015
40x14,3x2MM	25	36307.414.020
40x16,3x1,5MM	25	36307.416.015
40x16,3x2MM	25	36307.416.020
40x20,4x1MM	25	36307.420.010
40x20,4x1,5MM	25	36307.420.015
40x20,4x2MM	25	36307.420.020
40x20,4x2,25MM	25	36307.420.022
40x20,4x2,5MM	25	36307.420.025
45x22,4x1,25MM	10	36307.472.012
45x22,4x1,75MM	10	36307.472.017
45x22,4x2,5MM	10	36307.472.025
50x18,4x2MM	10	36307.518.020
50x20,4x2MM	10	36307.520.020
50x22,4x2MM	10	36307.522.020
50x22,4x2,5MM	10	36307.522.025
50x25,4x1,25MM	10	36307.525.012
50x25,4x2MM	10	36307.525.020
50x25,4x2,5MM	10	36307.525.025
50x25,4x3MM	10	36307.525.030
56x28,5x1,5MM	10	36307.588.015
56x28,5x2MM	10	36307.588.020
56x28,5x3MM	10	36307.588.030
60X20,5X2,5	5	36307.620.025
60x25,4x2,5MM	5	36307.625.025
60x25,4x3MM	5	36307.625.030
60x30,5x2,5MM	5	36307.630.025
60x30,5x3MM	5	36307.630.030
60x30,5x3,5MM	5	36307.630.035
63x31x1,8MM	5	36307.661.018
63x31x2,5MM	5	36307.661.025
63x31x3,5MM	5	36307.661.035
70x25,5x2MM	5	36307.725.020
70x30,5x3MM	5	36307.730.030
70x35,5x3MM	5	36307.735.030
70x35,5x4MM	5	36307.735.040
70x40,5x4MM	5	36307.740.040
70x40,5x5MM	5	36307.740.050
71x36x2MM	5	36307.746.020
71x36x2,5MM	5	36307.746.025
71x36x4MM	5	36307.746.040
80x31x3MM	1	36307.831.030
80x36x3MM	1	36307.836.030
80x36x4MM	1	36307.836.040
80x41x2,25MM	1	36307.841.022
80x41x3MM	1	36307.841.030
80x41x4MM	1	36307.841.040
80x41x5MM	1	36307.841.050
90x46x2,5MM	1	36307.946.025
90x46x3,5MM	1	36307.946.035
90x46x5MM	1	36307.946.050
100x41x4MM	1	36307.960.004
100x51x2,7MM	1	36307.960.027
100x51x3,5MM	1	36307.960.035
100x51x5MM	1	36307.960.050
100x51x6MM	1	36307.960.060
112x57x4MM	1	36307.968.040
112x57x6MM	1	36307.968.060

Conical spring washer for bolted connections



DIN 6796



Technical data

For nom.size	d_1 (H14)	d_2 (h14)	s	h (max.)
M3	3,2	7	0,6	0,85
M4	4,3	9	1	1,3
M5	5,3	11	1,2	1,55
M6	6,4	14	1,5	2
M8	8,4	18	2	2,6
M10	10,5	23	2,5	3,2
M12	13	29	3	3,95
M14	15	35	3,5	4,65
M16	17	39	4	5,25
M20	21	45	5	6,4
M22	23	49	5,5	7,05
M24	25	56	6	7,75

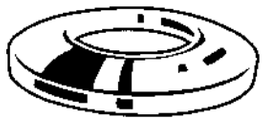
- Conical spring washers acc. to DIN 6796 should be used in combination with fasteners of property class 8.8 and 10.9, use under dynamic load is not allowed.
- For locking under dynamic load is referred to locking edge washers, SCHNORR safety washers and NORD-LOCK vibration proof washers.

Article groups

Material	Surface treatment	Packaging	Code	Page
Spring steel DIN267-26		Standard	36270	7-72
Spring steel DIN267-26	Mech.zipl. yell.p.	Standard	36273	7-72

36270 Conical spring washer for bolted connections — L07C

Material Spring steel DIN267-26
Packaging Standard



7

For nom. size	✉	Art.number	For nom. size	✉	Art.number	For nom. size	✉	Art.number
M4	100	36270.040.001	M10	100	36270.100.001	M20	50	36270.200.001
M5	100	36270.050.001	M12	100	36270.120.001	M22	25	36270.220.001
M6	100	36270.060.001	M14	50	36270.140.001	M24	25	36270.240.001
M8	100	36270.080.001	M16	50	36270.160.001			

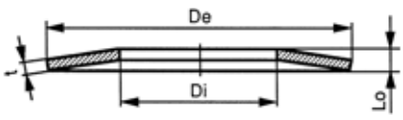
- Warning: electro-galvanizing of these products may cause hydrogen embrittlement.

36273 Conical spring washer for bolted connections — L07C

Material Spring steel DIN267-26
Surface treatment Mechanical zinc plated yellow passivated
Packaging Standard

For nom. size	✉	Art.number	For nom. size	✉	Art.number	For nom. size	✉	Art.number
M3	100	36273.030.001	M8	100	36273.080.001	M16	50	36273.160.001
M4	100	36273.040.001	M10	100	36273.100.001	M20	50	36273.200.001
M5	100	36273.050.001	M12	100	36273.120.001	M24	25	36273.240.001
M6	100	36273.060.001	M14	50	36273.140.001			

Disc spring for critical applications



Technical data

De (h12)	D_i (H12)	t	Lo	F
8	3,2	0,3	0,55	104
8	3,2	0,4	0,6	186
8	3,2	0,5	0,7	357
10	3,2	0,3	0,65	98
10	3,2	0,4	0,7	179
10	3,2	0,5	0,75	279
10	4,2	0,4	0,7	189
10	4,2	0,5	0,75	294
12	4,2	0,4	0,8	178
12	4,2	0,5	0,85	284
12	5,2	0,5	0,9	350
12	5,2	0,6	0,95	506
12	6,2	0,5	0,85	326
12	6,2	0,6	0,95	552
12	5,2	0,5	0,85	272
15	5,2	0,4	0,95	176
15	5,2	0,5	1	278
15	5,2	0,6	1,05	407
15	5,2	0,7	1,1	555
15	6,2	0,5	1	289
15	6,2	0,6	1,05	424
15	6,2	0,7	1,1	578
15	8,2	0,7	1,1	666
15	8,2	0,8	1,2	982
18	6,2	0,4	1	139
18	6,2	0,5	1,1	245
18	6,2	0,6	1,2	400
18	6,2	0,7	1,25	553
18	6,2	0,8	1,3	726
18	8,2	0,5	1,1	265
18	8,2	0,7	1,25	596
18	8,2	0,8	1,3	783
18	8,2	1	1,4	1181
20	8,2	0,6	1,3	412
20	8,2	0,7	1,35	569
20	8,2	0,8	1,4	751
20	8,2	0,9	1,45	954
20	8,2	1	1,55	1294
20	10,2	0,9	1,45	1050
20	10,2	1	1,55	1425
20	10,2	1,25	1,75	2477
20	10,2	1,5	1,8	2521
23	8,2	0,7	1,5	544
23	8,2	0,8	1,55	719
23	8,2	0,9	1,6	919
23	10,2	0,9	1,65	1058
23	10,2	1	1,7	1315
23	12,2	1,25	1,85	2331
23	12,2	1,5	2	3297
25	12,2	1,25	1,95	2214
28	10,2	0,8	1,75	662
28	10,2	1	1,9	1130
28	10,2	1,25	2,05	1853
28	10,2	1,5	2,2	2723
28	12,2	1,5	2,25	3077
28	14,2	1,25	2,1	2240
31,5	12,2	1	2,1	1170
31,5	12,2	1,25	2,2	1800
31,5	12,2	1,5	2,35	2697

De (h12)	D_i (H12)	t	Lo	F
31,5	16,3	1,5	2,4	3230
31,5	16,3	2	2,75	6173
34	12,2	1	2,25	1172
34	12,2	1,25	2,35	1815
34	12,2	1,5	2,5	2721
34	14,2	1,25	2,4	1989
34	14,2	1,5	2,55	2984
34	16,3	2	2,85	5783
40	14,2	1,25	2,65	1778
40	14,2	1,5	2,75	2542
40	14,2	2	3,05	4763
40	16,3	1,5	2,8	2749
40	16,3	2	3,1	5169
40	18,3	2	3,15	5956
40	20,4	2	3,1	5701
40	20,4	2,5	3,45	9390
50	18,4	1,5	3,5	2603
50	18,3	2	3,5	4567
50	20,4	2	3,5	4687
50	22,4	2	3,6	5222
50	22,4	2,5	3,85	7919
50	25,4	1,5	3,1	2512
50	25,4	2,5	3,9	9063
60	20,4	2,5	4,3	7297
60	25,4	2,5	4,4	8164
60	25,4	3	4,65	11768
60	30,5	2,5	4,5	9430
60	30,5	3	4,7	13226
60	30,5	3,5	5	18153
70	25,5	2	4,5	4437
70	30,5	3	5,1	11426
70	35,5	3	5,1	12287
70	40,5	4	5,6	23351
70	40,5	5	6,2	33672
80	31	3	5,5	10352
80	36	3	5,7	11919
80	36	4	6,2	21400
80	41	4	6,2	22874
100	41	4	7,2	20251
100	51	5	7,8	36339
125	51	6	9,4	44307
125	61	6	9,6	50722
150	61	6	10,8	45456
150	81	8	11,7	89532
200	92	10	15,6	137688
200	112	12	16,2	195830
250	127	16	21,8	383017

- Disc springs are mostly used in critical applications with safety first. Similar applications can be found in for example safety torque limiter clutches, hinge stiffeners and applications of constant roll pressure. Because of the right combination c.q. stacking of the disc springs the elasticity and/or deflection can be dosed accurately. The technical specifications of these disc springs meet the highest expectations with reference to the static and dynamic load. They exceed the requirements of DIN 2093.
- Material group 1: t < 1,25 from steel Ck 67.
- Material group 2: 1,25 ≤ t ≤ 6,0 from steel 50 Cr V4.
- Material group 3: 6,0 > t ≤ 14,0 from steel 50 Cr V4.
- Fatique fractures can be largely prevented because the disc springs of material group 2 and 3 have machined edges.
- F = spring force in Newton at a deflection s ≈ 0,75 h_o ($h_o = L_o - t$).
- For the calculation of disc springs, see DIN 2092.
- Extensive technical data available on request.

36450 Disc spring for critical applications **L07C**

Material Steel Ck 67 Werkstoffnr. 1.1231
Surface treatment Phosphated
Packaging Standard

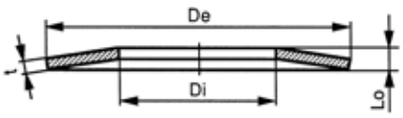
De x Di x t	✉	Art.number	De x Di x t	✉	Art.number	De x Di x t	✉	Art.number
8X3,2X0,3MM	100	36450.083.003				10X3,2X0,5MM	100	36450.103.005
8X3,2X0,4MM	100	36450.083.004	10X3,2X0,3MM	100	36450.103.003	10X4,2X0,4MM	100	36450.104.004
8X3,2X0,5MM	100	36450.083.005	10X3,2X0,4MM	100	36450.103.004	10X4,2X0,5MM	100	36450.104.005

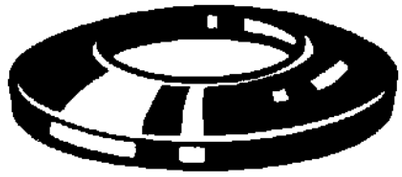
36450 Disc spring for critical applications

De x Di x t	✉	Art.number
12X4,2X0,4MM	100	36450.124.004
12X4,2X0,5MM	100	36450.124.005
12X5,2X0,5MM	100	36450.125.005
12X5,2X0,6MM	100	36450.125.006
12X6,2X0,5MM	100	36450.126.005
12X6,2X0,6MM	100	36450.126.006
12,5X5,2X0,5MM	100	36450.130.005
15X5,2X0,4MM	100	36450.155.004
15X5,2X0,5MM	100	36450.155.005
15X5,2X0,6MM	100	36450.155.006
15X5,2X0,7MM	100	36450.155.007
15X6,2X0,5MM	100	36450.156.005
15X6,2X0,6MM	100	36450.156.006
15X6,2X0,7MM	100	36450.156.007
15X8,2X0,7MM	100	36450.158.007
15X8,2X0,8MM	100	36450.158.008
18X6,2X0,4MM	100	36450.186.004
18X6,2X0,5MM	100	36450.186.005
18X6,2X0,6MM	100	36450.186.006
18X6,2X0,7MM	100	36450.186.007
18X6,2X0,8MM	100	36450.186.008
18X8,2X0,5MM	100	36450.188.005
18X8,2X0,7MM	100	36450.188.007
18X8,2X0,8MM	100	36450.188.008
18X8,2X1,0MM	100	36450.188.010
20X8,2X0,6MM	50	36450.208.006
20X8,2X0,7MM	50	36450.208.007
20X8,2X0,8MM	50	36450.208.008
20X8,2X0,9MM	50	36450.208.009
20X8,2X1,0MM	50	36450.208.010
20X10,2X0,9MM	50	36450.210.009
20X10,2X1,0MM	50	36450.210.010
20X10,2X1,25MM	50	36450.210.012
20X10,2X1,5MM	50	36450.210.015
23X8,2X0,7MM	50	36450.238.007
23x8,2x0,8MM	50	36450.238.008
23X8,2X0,9MM	50	36450.238.009
23X10,2X0,9MM	50	36450.240.009
23X10,2X1,0MM	50	36450.240.010
23X12,2X1,25MM	50	36450.242.012
23X12,2X1,5MM	50	36450.242.015
25X12,2X1,25MM	50	36450.262.012
28X10,2X0,8MM	50	36450.290.008
28X10,2X1,0MM	50	36450.290.010
28X10,2X1,25MM	50	36450.290.012
28X10,2X1,5MM	50	36450.290.015
28X12,2X1,5MM	50	36450.292.015
28X14,2X1,25MM	50	36450.294.012
31,5X12,2X1,0MM	50	36450.327.010
31,5X12,2X1,25MM	50	36450.327.012
31,5X12,2X1,5MM	50	36450.327.015
31,5X16,3X1,5MM	50	36450.331.015
31,5X16,3X2,0MM	50	36450.331.020
34X12,2X1,0MM	25	36450.352.010
34X12,2X1,25MM	25	36450.352.012
34X12,2X1,5MM	25	36450.352.015
34X14,2X1,25MM	25	36450.354.012
34X14,2X1,5MM	25	36450.354.015
34X16,3X2,0MM	25	36450.356.020
40X14,2X1,25MM	25	36450.414.012
40X14,2X1,5MM	25	36450.414.015
40x14,2x2MM	25	36450.414.020
40X16,3X1,5MM	25	36450.416.015
40X16,3X2,0MM	25	36450.416.020
40X18,3X2,0MM	25	36450.418.020
40X20,4X2,0MM	25	36450.420.020
40X20,4X2,5MM	25	36450.420.025
50X18,4X1,5MM	25	36450.518.015
50X18,3X2,0MM	10	36450.518.020
50X20,4X2,0MM	10	36450.520.020
50X22,4X2,0MM	10	36450.522.020
50X22,4X2,5MM	10	36450.522.025
50X25,4X1,5MM	10	36450.525.015
50X25,4X2,5MM	10	36450.525.025
60X20,4X2,5MM	5	36450.620.025
60X25,4X2,5MM	5	36450.625.025
60X25,4X3,0MM	5	36450.625.030
60X30,5X2,5MM	5	36450.630.025
60X30,5X3,0MM	5	36450.630.030
60X30,5X3,5MM	5	36450.630.035
70X25,5X2,0MM	5	36450.725.020
70X30,5X3,0MM	5	36450.730.030
70X35,5X3,0MM	5	36450.735.030
70X40,5X4,0MM	5	36450.740.040
70X40,5X5,0MM	5	36450.740.050
80X31,0X3,0MM	1	36450.831.030
80X36,0X3,0MM	1	36450.836.030
80x36x4MM	1	36450.836.040
80X41,0X4,0MM	1	36450.841.040
100X41,0X4,0MM	1	36450.960.040
100X51,0X5,0MM	1	36450.982.050
125X51,0X6,0MM	1	36450.987.060
125X61,0X6,0MM	1	36450.987.065
150X61,0X6,0MM	1	36450.992.060
150X81,0X8,0MM	1	36450.992.080
200X92,0X10,0MM	1	36450.997.100
200X112,0X12,0MM	1	36450.997.120
250X127,0X16,0MM	1	36450.999.160

7

Ball bearing location disc spring



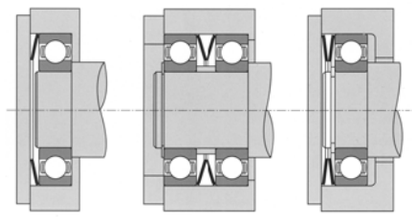


Technical data

De (h12)	D_i (H12)	t	Lo	F
9,8	6,2	0,2	0,4	23
12,8	7,2	0,25	0,5	29
15,8	8,2	0,25	0,55	23
18,8	10,2	0,35	0,7	51
21,8	12,3	0,35	0,75	46
23,7	14,3	0,4	0,9	81
25,7	14,3	0,4	0,9	63
27,7	17,3	0,4	1	80
29,7	17,3	0,4	1,1	83
31,7	20,4	0,4	1,1	81
34,6	22,4	0,5	1,2	118
36,6	20,4	0,5	1,3	110
39,6	25,5	0,5	1,3	110
41,6	25,5	0,5	1,4	113
46,5	30,5	0,6	1,4	153
51,5	35,5	0,6	1,5	135
54,5	40,5	0,6	1,5	141
61,5	40,5	0,7	1,8	176

- F = spring force in Newton at a deflection s ≈ 0,75 h_o ($h_o = L_o - t$).
- Extensive technical data available on request.

Example of application



7

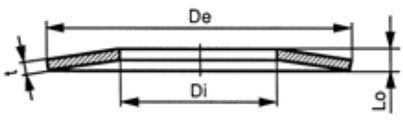
36460 Ball bearing location disc spring **L07C**

Material	Steel
Surface treatment	Phosphated
Packaging	Standard

De x Di x t	✉	Art.number	De x Di x t	✉	Art.number	De x Di x t	✉	Art.number
9,8X6,2X0,2MM	100	36460.104.002	25,7X14,3X0,4MM	50	36460.271.004	39,6X25,5X0,5MM	25	36460.421.005
12,8X7,2X0,25MM	100	36460.135.002	27,7X17,3X0,4MM	50	36460.294.004	41,6X25,5X0,5MM	25	36460.441.005
15,8X8,2X0,25MM	100	36460.166.002	29,7X17,3X0,4MM	50	36460.314.004	46,5X30,5X0,6MM	25	36460.495.006
18,8X10,2X0,35MM	50	36460.198.003	31,7X20,4X0,4MM	25	36460.337.004	51,5X35,5X0,6MM	10	36460.550.006
21,8X12,3X0,35MM	50	36460.230.003	34,6X22,4X0,5MM	25	36460.368.005	54,5X40,5X0,6MM	10	36460.585.006
23,7X14,3X0,4MM	50	36460.251.004	36,6X20,4X0,5MM	25	36460.386.005	61,5X40,5X0,7MM	10	36460.655.007

Disc springs for critical applications type A (heavy)

DIN 2093 A



Technical data

De (h12)	D_i (H12)	t	Lo	F
8	4,2	0,4	0,6	210
10	5,2	0,5	0,75	329
12,5	6,2	0,7	1	673
14	7,2	0,8	1,1	813
16	8,2	0,9	1,25	1000
18	9,2	1	1,4	1250
20	10,2	1,1	1,55	1530
22,5	11,2	1,25	1,75	1950
25	12,2	1,5	2,05	2910
28	14,2	1,5	2,15	2850
31,5	16,3	1,75	2,45	3900
35,5	18,3	2	2,8	5190
40	20,4	2,25	3,15	6450
45	22,4	2,5	3,5	7720
50	25,4	3	4,1	12000
56	28,5	3	4,3	11400
63	31	3,5	4,9	15000
71	36	4	5,6	20500
80	41	5	6,7	33700
90	46	5	7	31400
100	51	6	8,2	48000
112	57	6	8,5	43800

- Disc springs acc. to DIN 2093 are mostly used in critical applications with safety first. Similar applications can be found in for example safety torque limiter clutches, hinge stiffeners and applications of constant roll pressure. Because of the right combination c.q. stacking of the disc springs the elasticity and/or deflection can be dosed accurately. The technical specifications of the disc springs above meet the highest expectations with reference to the static and dynamic load. They exceed the requirements of DIN 2093.
- Material group 1: t < 1,25 from steel Ck 75.
- Material group 2: 1,25 ≤ t ≤ 6,0 from steel 50 Cr V4 (fatique fractures can be largely prevented because these disc springs have machined edges).
- F = spring force in Newton at a deflection s ≈ 0,75 h_o (h_o = L_o – t).
- For the calculation of disc springs, see DIN 2092.
- Extensive technical data available on request.

7

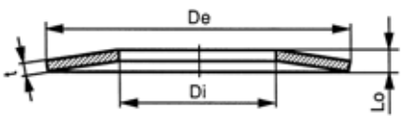
36300 Disc springs for critical applications type A (heavy) **L07C**

Material Steel Ck 75 Werkstoffnr. 1.1248
Surface treatment Phosphated
Packaging Standard

De x Di x t	✉	Art.number	De x Di x t	✉	Art.number	De x Di x t	✉	Art.number
8X4,2X0,4MM	100	36300.084.004	25X12,2X1,5MM	50	36300.262.015	63X31X3,5MM	5	36300.661.035
10X5,2X0,5MM	100	36300.105.005	28X14,2X1,5MM	50	36300.294.015	71X36X4MM	5	36300.746.040
12,5X6,2X0,7MM	100	36300.131.007	31,5X16,3X1,75MM	50	36300.331.017	80X41X5MM	1	36300.841.050
14X7,2X0,8MM	100	36300.147.008	35,5X18,3X2MM	25	36300.373.020	90X46X5MM	1	36300.946.050
16X8,2X0,9MM	100	36300.168.009	40X20,4X2,25MM	25	36300.420.022	100X51X6MM	1	36300.960.060
18X9,2X1MM	100	36300.189.010	45X22,4X2,5MM	10	36300.472.025	112X57X6MM	1	36300.968.060
20X10,2X1,1MM	50	36300.210.011	50X25,4X3MM	10	36300.525.030			
22,5X11,2X1,25MM	50	36300.236.012	56X28,5X3MM	10	36300.588.030			

Disc spring type A (heavy)

DIN ≈2093 A/C



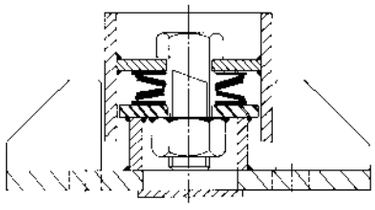
Technical data

De (h12)	D_i (H12)	t	Lo	F
8	4,2	0,4	0,6	192
10	5,2	0,5	0,75	298
12	5,2	0,5	0,9	350
12-1	6,2	0,6	0,95	547
12,5	6,2	0,7	0,95	499
14	7,2	0,8	1,1	730
16	8,2	0,9	1,25	928
18	9,2	1	1,4	1149
20	10,2	1,1	1,55	1394
22,5	11,2	1,25	1,75	1402
25	12,2	1,5	1,9	1931
28	14,2	1,5	2,15	2004
31,5	16,3	1,75	2,3	2745
35,5	18,3	2	2,65	4200
40	20,4	1	2,3	932
40	20,4	2,25	2,95	4630
45	22,4	2,5	3,3	5719
50	25,4	3	3,85	9212
56	28,5	3	4,05	9134
71	36	4	5,6	16626
80	41	5	6,7	25845
100	51	6	8,2	37336

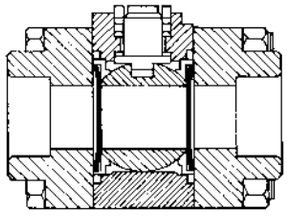
- Disc springs acc. to » DIN 2093 A are mostly used in critical applications with safety first. Similar applications can be found in for example safety torque limiter clutches, hinge stiffeners and applications of constant roll pressure. Because of the right combination c.q. stacking of the disc springs the elasticity and/or deflection can be dosed accurately. The technical specifications of the disc springs above meet the highest expectations with reference to the static and dynamic load. Heat treatment gives a copper-bronze colour to this disc springs.
- D_e (h12) 8-10-12,5-14-16-18-20-22,5-25-28-31,5-40 X 12 CrNi 17 7 (Werkstoffnr. 1.4310).
- D_e (h12) 35,5-50-56-71 X 35 CrMo 17 (Werkstoffno. 1.4122).
- D_e (h12) 45 X 7 CrNiAl 17 7 (Werkstoffno. 1.4568).
- D_e (h12) 80-100 X 22 CrMoV 12 1 (Werkstoffno. 1.4923).
- F = spring force in Newton at a deflection s = 0,75 h_o ($h_o = L_o - t$).
- D_e (h12)=40, t=1 ATTENTION: acc. to ≈ DIN 2993 C standardised: execution ”light”.
- For the calculation of disc springs, see DIN 2092.
- Extensive technical data available on request.

7

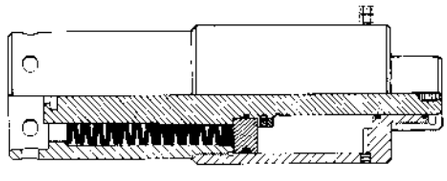
Examples of application



Shock absorption



Ball valve



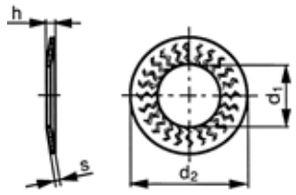
Power switch

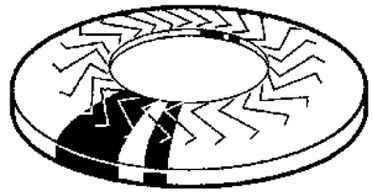
51448 Disc spring type A (heavy) R09A

Material Stainless steel
Packaging Standard

De x Di x t	✉	Art.number	De x Di x t	✉	Art.number	De x Di x t	✉	Art.number
8X4,2X0,4MM	50	51448.084.004	20X10,2X1,1MM	25	51448.210.011	40X20,4X2,25MM	10	51448.420.022
10X5,2X0,5MM	50	51448.105.005	22,5X11,2X1,25MM	25	51448.236.012			
12X5,2X0,5MM	50	51448.125.005	25X12,2X1,5MM	25	51448.262.015	45X22,4X2,5MM	5	51448.472.025
12,5X6,2X0,7MM	50	51448.131.007	28X14,2X1,5MM	25	51448.294.015	50X25,4X3MM	5	51448.520.030
14X7,2X0,8MM	50	51448.147.008	31,5X16,3X1,75MM	25	51448.331.017	56X28,5X3MM	5	51448.588.030
16X8,2X0,9MM	50	51448.168.009	35,5X18,3X2MM	10	51448.373.020	71X36X4MM	1	51448.746.040
18X9,2X1MM	50	51448.189.010	40X20,4X1,0MM	10	51448.420.010			

Locking disc spring type M





Technical data

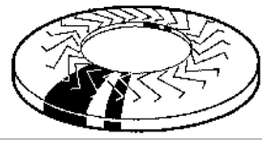
For nom.size	d_1	d_2	h	s
M4	4,1	10,2	1,5	1
M5	5,1	12,2	1,8	1,2
M6	6,1	14,2	2,2	1,4
M8	8,2	18,2	2,4	1,4
M10	10,2	22,25	2,75	1,6
M12	12,4	27,25	3,05	1,8
M14	14,4	30,25	3,5	2,4
M16	16,4	32,5	3,95	2,5

Article groups

Material	Surface treatment	Packaging	Code	Page
Spring steel 420-510 HV10	FLZNNC-NC6	Standard	36325	7-80
St.St. A4		Standard	55443	7-80

36325 SK Locking disc spring type M **L07C**

Material Spring steel 420-510 HV10
Surface treatment Zinc flake Cr6+ free - ISO 10683 flZnnc
Packaging Standard



For nom. size	✉	Art.number	For nom. size	✉	Art.number	For nom. size	✉	Art.number
M5	250	36325.050.001	M10	200	36325.100.001	M16	100	36325.160.001
M6	250	36325.060.001	M12	150	36325.120.001			
M8	200	36325.080.001	M14	100	36325.140.001			

7

- A ISO 10683 Zinc Flake surface coating eliminates the possibilities of damage which can arise due to hydrogen embrittlement.
- SK-locking disc springs, type M, can be used with fasteners class ≤ 10.9.

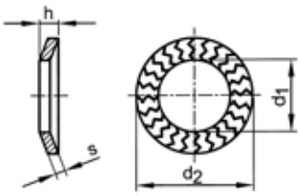
55443 SK Locking disc spring type M **R49A**

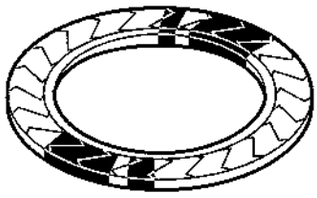
Material Stainless steel A4
Packaging Standard

For nom. size	✉	Art.number	For nom. size	✉	Art.number	For nom. size	✉	Art.number
M4	250	55443.040.001	M8	200	55443.080.001	M16	100	55443.160.001
M5	250	55443.050.001	M10	200	55443.100.001			
M6	250	55443.060.001	M12	100	55443.120.001			

- SK-locking disc springs, type M, can be used with stainless steel A2/A4 fasteners, up to and including class 80.

Locking disc spring type Z





Technical data

For nom.size	d_1	d_2	h	s
M6	6,1	9,9	1,6	1,4
M8	8,2	12,7	1,7	1,4
M10	10,2	16,1	2	1,6
M12	12,4	18,3	2,2	1,8
M16	16,4	24,6	3,1	2,5

- SK locking disc springs, type Z, can be used with hexagon socket head cap screws or cheese head screws, class ≤ 10.9.

36326 SK Locking disc spring type Z **L07C**

Material Spring steel 420-510 HV10
Surface treatment Zinc flake Cr6+ free - ISO 10683 flZnnc
Packaging Standard

For nom. size	✉	Art.number	For nom. size	✉	Art.number	For nom. size	✉	Art.number
M6	250	36326.060.001	M10	200	36326.100.001	M16	100	36326.160.001
M8	200	36326.080.001	M12	150	36326.120.001			

- A ISO 10683 Zinc Flake surface coating eliminates the possibilities of damage which can arise due to hydrogen embrittlement.