

Disc Spring Washers DIN2093 碟型弹簧垫圈DIN2093



Product introduction

DIN 2093 springs are conical washers with elastic properties. They are commonly known as disc springs but sometimes they are called Belleville washers. These springs are manufactured according to the specifications of DIN 2093 standard, which establishes all the characteristics these pieces have to meet.

The main feature of DIN 2093 disc springs is the capacity to generate high spring force compared to traditional helical springs, in small enclosures and with short displacements. These spring washers are under small deflection when submitted to large loads. Serial or parallel assembly allows us to obtain higher deflections and loads.

Series

Some springs are classified as A, B or C. This classification corresponds, according to DIN 2093 standard, to a specific relation between the external diameter of the disc spring and its thickness. The three series for each standard measure are established:

Series A: $D_e/t \approx 18$; high force springs

Series B: $D_e/t \approx 28$; medium force springs

Series C: $D_e/t \approx 40$; low force springs

Features

- High load capacity with small deflection
- High fatigue life
- Largely Self-damping, giving good shock absorption and energy dissipation
- Singly or in stacks to meet various requirements
- Various characteristics due to different thickness and height
- Low Maintenance cost & Greater Security

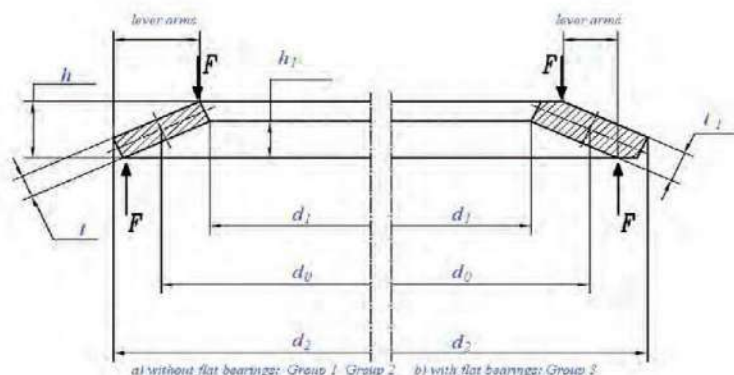
Product application:

- Automotive & Engines
- Clutches, brakes
- Valves, pumps
- Machine Tools
- Screwed or bolted sections.
- Bearing preload.
- Hoists, cranes
- Electrical switch gear
- And many more applications



Disc Spring Washers DIN2093A

碟型弹簧垫圈DIN2093 Type A

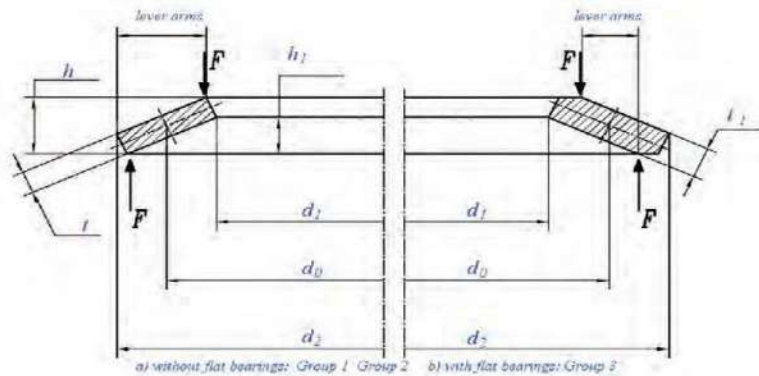


For Bolt			8	10	12.5	14	16	18	20	22.5	25	28	31.5	35.5	40	45	50
d ₂	h12	max	4.32	5.32	6.35	7.35	8.35	9.35	10.38	11.38	12.38	14.38	16.48	18.51	20.61	22.61	25.61
		min	4.2	5.2	6.2	7.2	8.2	9.2	10.2	11.2	12.2	14.2	16.3	18.3	20.4	22.4	25.4
d ₁	h12	max	8	10	12.5	14	16	18	20	22.5	25	28	31.5	35.5	40	45	50
		min	7.85	9.85	12.32	13.82	15.82	17.82	19.79	22.29	24.79	27.79	31.25	35.25	39.75	44.75	49.75
t			0.4	0.5	0.7	0.8	0.9	1	1.1	1.25	1.5	1.5	1.75	2	2.25	2.5	3
t ₁			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
h4			0.2	0.25	0.3	0.3	0.35	0.4	0.45	0.5	0.55	0.65	0.7	0.8	0.9	1	1.1
h			0.6	0.75	1	1.1	1.25	1.4	1.55	1.75	2.05	2.15	2.45	2.8	3.15	3.5	4.1
washer type			1	1	1	1	1	1	1	2	2	2	2	2	2	2	2

For Bolt			56	63	71	80	90	100	112	125	140	160	180	200	225	250
d ₂	h12	max	28.71	31.25	36.25	41.25	46.25	51.3	57.3	64.3	72.3	82.35	92.35	102.35	112.4	127.4
		min	28.5	31	36	41	46	51	57	64	72	82	92	102	112	127
d ₁	h12	max	56	63	71	80	90	100	112	125	140	160	180	200	225	250
		min	55.7	62.7	70.7	79.7	89.65	99.65	111.65	124.6	139.6	159.6	179.6	199.54	224.5	249.5
t			3	3.5	4	5	5	6	6	8	8	10	10	12	12	14
t ₁			-	-	-	-	-	-	-	-	-	-	-	-	-	-
h4			1.3	1.4	1.6	1.7	2	2.2	2.5	2.6	3.2	3.5	4	4.2	5	5.6
h			4.3	4.9	5.6	6.7	7	8.2	8.5	10.6	11.2	13.5	14	16.2	17	19.6
washer type			2	2	2	2	2	2	2	3	3	3	3	3	3	3



Disc Spring Washers DIN2093B 碟型弹簧垫圈 DIN2093 Type B

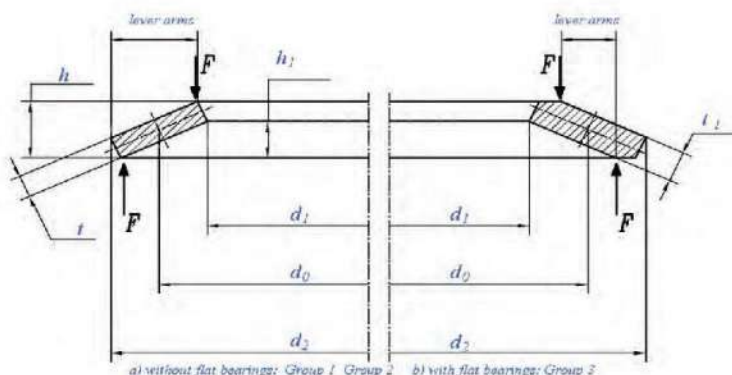


For Bolt			8	10	12.5	14	16	18	20	22.5	25	28	31.5	35.5	40	45	50
d ₂	h12	max	8	10	12.5	14	16	18	22.5	22.5	25	28	31.25	35.5	40	45	50
		min	7.85	9.85	12.32	13.82	15.82	17.82	22.29	22.29	24.79	31.25	35.25	39.75	44.75	44.75	49.75
d ₁	h12	max	4.32	5.32	6.35	7.35	8.35	9.35	11.38	11.38	12.38	14.38	16.48	18.51	20.61	22.61	25.61
		min	4.2	5.2	6.2	7.2	8.2	9.2	11.2	11.2	24.79	27.79	31.25	35.25	39.75	44.75	49.75
t			0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.8	0.9	1	1.25	1.25	1.5	1.75	2
t ₁			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
h4			0.25	0.3	0.35	0.4	0.45	0.5	0.55	0.65	0.7	0.8	1	0.9	1.15	1.3	1.4
h			0.55	0.7	0.85	0.9	1.05	1.2	1.35	1.45	1.6	1.8	2.15	2.25	2.65	3.05	3.4
washer type			1	1	1	1	1	1	2	2	2	2	2	2	2	2	2

For Bolt			56	63	71	80	90	100	112	125	140	160	180	200	225	250
d ₂	h12	max	56	63	71	80	90	100	112	125	140	160	180	200	224.5	250
		min	55.7	62.7	70.7	79.7	89.65	99.65	111.7	124.6	139.6	139.6	179.6	199.5	224.5	249.5
d ₁	h12	max	28.71	31.25	36.25	41.25	46.25	51.3	57.3	64.3	72.3	72.3	92.35	102.4	112.4	127.4
		min	28.5	31	36	41	46	51	57	64	72	82	92	102	112	127
t			2	2.5	2.5	3	3.5	3.5	4	5	5	6	6	8	8	10
t ₁			—	—	—	—	—	—	—	—	—	—	—	—	—	—
h4			1.6	1.75	2	2.3	2.5	2.8	3.2	3.5	4	4.5	5.1	5.6	6.5	7
h			3.6	4.25	4.5	5.3	6	6.3	7.2	8.5	9	10.5	11.1	13.6	14.5	17
washer type			2	2	2	2	2	2	2	3	3	3	3	3	3	3



Disc Spring Washers DIN2093C 碟型弹簧垫圈DIN2093 Type C



For Bolt			8	10	12.5	14	16	18	20	22.5	25	28	31.5	35.5	40	45	50
d ₂	h12	max	8	10	12.5	14	16	18	22.5	22.5	25	28	31.5	35.5	40	45	50
		min	7.85	9.85	12.32	13.85	15.82	17.82	19.79	22.29	24.79	27.79	31.25	35.25	39.75	44.75	49.75
d ₁	h12	max	4.32	5.32	6.35	7.35	8.35	9.35	11.38	11.38	12.38	14.38	16.48	18.57	20.61	22.61	25.61
		min	4.2	5.2	6.2	7.2	8.2	9.2	10.2	11.2	12.2	14.2	16.3	18.3	20.4	22.4	25.4
t			0.2	0.25	0.35	0.35	0.4	0.45	0.5	0.6	0.7	0.8	0.8	0.9	1	1.25	1.25
t ₁			—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
h4			0.25	0.3	0.45	0.45	0.5	0.6	0.65	0.8	0.9	1	1.05	1.15	1.3	1.6	1.6
h			0.45	0.55	0.8	0.8	0.9	1.05	1.15	1.4	1.6	1.8	1.8	2.05	2.3	2.85	2.85
washer type			1	1	1	1	1	1	1	11	11	1	1	1	1	2	2

For Bolt			56	63	71	80	90	100	112	125	140	160	180	200	225	250
d ₂	h12	max	56	63	71	80	90	100	112	125	140	160	180	200	224.54	250
		min	55.7	62.7	70.7	79.7	89.65	99.65	111.65	124.6	139.6	139.6	179.6	199.54	224.54	249.54
d ₁	h12	max	28.71	31.25	36.25	41.25	46.25	51.3	57.3	64.36	72.3	72.3	92.35	102.35	112.35	127.4
		min	28.5	31	36	41	46	51	57	64	72	82	92	102	112	127
t			1.5	1.8	2	2.25	2.5	2.7	3	3.5	3.8	4.3	4.8	5.5	6.5	7
t ₁			—	—	—	—	—	—	—	—	—	—	—	—	—	—
h4			1.95	2.35	2.6	2.95	3.2	3.5	3.9	4.5	4.9	5.6	6.2	7	7.1	7.8
h			3.45	4.15	4.6	5.2	5.7	6.2	6.9	8	8.7	9.9	11	12.5	13.6	14.8
washer type			2	2	2	2	2	2	2	2	2	2	2	2	3	3

