

Plain Washer

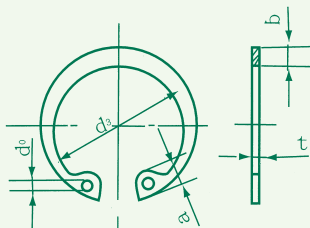
Plain Washer 平面介子

Size	(T) Thickness	(ID) Inside Dia.	mm (OD) Outside Dia.
M1.5	0.4	1.6	3.3
M1.7	0.5	1.9	5
M2	0.3	2.3	6
M2	0.5	2.3	6
M2.3	0.5	2.5	7
M2.3	0.8	2.5	11.2
M2.5	0.5	2.7	8
M2.5	0.8	2.65	5.5
M2.6	0.5	2.8	7
M2.6	0.7	2.8	9.5
M3	0.6	3.3	5.3
M3	1.2	3.2	10
M3.5	0.7	3.8	6.1
M3.5	1	3.7	11

Plain Washer 平面介子

unit : mm

Size	(T) Thickness	(ID) Inside Dia.	mm (OD) Outside Dia.
M4	0.5	4.2	7.1
M4	1.2	4.3	13
M5	0.6	5.3	11.5
M5	1.4	5.3	16
M6	0.5	6.2	12.5
M7	0.4	7.2	12
M8	0.6	8.2	14
M9	0.6	9.2	14
M10	1	10.2	14
M12	1.6	12.5	19.9
M14	0.8	14.1	20
M16	0.9	16.2	22.6
M17	0.9	17.6	33
M20	0.5	20.3	24.3



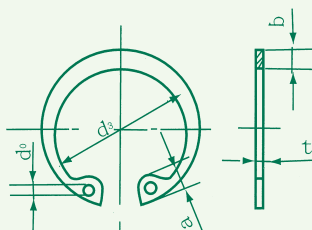
Internal Retaining Ring

Retaining Rings (Internal) 定位介子 (內)

JIS B2804
unit : mm

Size-No. RTW	Ring Dimension						
	d ₃		t		b	a	d ₁
	Basic	Tol.	Basic	Tol.	Approx.	Approx.	Min.
* 6	6.7	±0.18	0.4	±0.03	0.7	1.6	0.8
* 7	7.7	±0.18	0.4	±0.03	0.8	1.7	0.8
* 8	8.8	±0.18	0.4	±0.03	0.9	1.7	0.8
* 9	9.8	±0.18	0.6	±0.04	1.1	2.2	0.8
*10	10.7	±0.18	1	±0.05	1.5	2.8	1.2
*11	11.8	±0.18	1	±0.05	1.5	3	1.2
*12	13	±0.18	1	±0.05	1.7	3.1	1.5
*13	14.1	±0.18	1	±0.05	1.7	3.1	1.5
*14	15.1	±0.18	1	±0.05	1.9	3.6	1.7
*15	16.2	±0.18	1	±0.05	1.9	3.6	1.7
*16	17.3	±0.18	1	±0.05	1.9	3.7	1.7
*17	18.3	±0.2	1	±0.05	1.9	3.8	1.7
*18	19.5	±0.2	1	±0.05	2.4	4	1.7
19	20.5	±0.2	1	±0.05	2.5	4	2
20	21.5	±0.2	1	±0.05	2.5	4	2
21	22.5	±0.2	1	±0.05	2.5	4.1	2
22	23.5	±0.2	1	±0.05	2.5	4.1	2
24	25.9	±0.2	1.2	±0.06	2.5	4.3	2
25	26.9	±0.2	1.2	±0.06	3	4.4	2
26	27.9	±0.2	1.2	±0.06	3	4.6	2
28	30.1	±0.25	1.2	±0.06	3	4.6	2
30	32.1	±0.25	1.2	±0.06	3	4.7	2
32	34.4	±0.25	1.2	±0.06	3.5	5.2	2.5
34	36.5	±0.25	1.5	±0.06	3.5	5.2	2.5
35	37.8	±0.25	1.5	±0.06	3.5	5.2	2.5
36	38.8	±0.25	1.5	±0.06	3.5	5.2	2.5

To Be Continued



Internal Retaining Ring

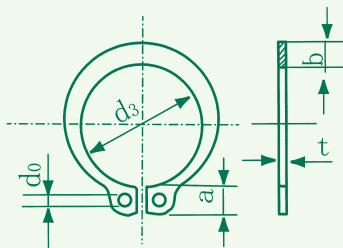
Retaining Rings (Internal) 定位介子 (內)

JIS B2804
unit : mm

Size-No. RTW	Ring Dimension						
	d ₃	t	b	a	d ₀		Min.
	Basic	Tol.	Basic	Tol.	Approx.	Approx.	
37	39.8	±0.25	1.5	±0.06	3.5	5.2	2.5
38	40.8	±0.25	1.5	±0.06	4	5.3	2.5
* 39	42	±0.4	1.75	±0.07	4	5.4	2.5
O 40	43.5	±0.4	1.75	±0.07	4	5.7	2.5
O 42	45.5	±0.4	1.75	±0.07	4	5.8	2.5
O 45	48.5	±0.4	1.75	±0.07	4.5	5.9	2.5
* 46	49.7	±0.45	1.75	±0.07	5	5.7	2.5
O 47	50.5	±0.45	1.75	±0.07	4.5	6.1	2.5
O 48	51.5	±0.45	1.75	±0.07	4.5	6.2	2.5
50	54.2	±0.45	2	±0.07	4.5	6.5	2.5
52	56.2	±0.45	2	±0.07	5.1	6.5	2.5
55	59.2	±0.45	2	±0.07	5.1	6.5	2.5
56	60.2	±0.45	2	±0.07	5.1	6.6	2.5
58	62.2	±0.45	2	±0.07	5.1	6.8	2.5
60	64.2	±0.45	2	±0.07	5.5	6.8	2.5
62	66.2	±0.45	2	±0.07	5.5	6.9	2.5
63	67.2	±0.45	2	±0.07	5.5	6.9	2.5

* Mark= Company's Specification

O Mark=JIS Standard



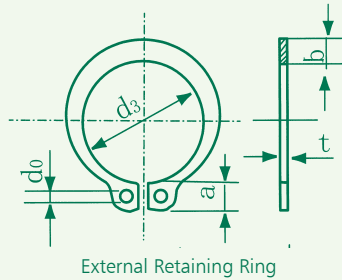
External Retaining Rings

Retaining Rings (External) 定位介子 (外)

JIS B2804
unit : mm

Size-No. RTW	Ring Dimension						
	d ₃		t		b	a	d ₀
	Basic	Tol.	Basic	Tol.	Approx.	Approx.	Min.
* 3	2.7	+0.04/0.15	0.25	±0.025	0.5	1.7	0.7
* 4	3.7	+0.04/0.15	0.4	±0.03	0.9	2.2	0.8
* 5	4.7	+0.04/0.15	0.6	±0.04	1.1	2.4	0.8
* 6	5.6	+0.06/0.2	0.7	±0.04	1.3	2.8	1
* 7	6.5	+0.06/0.2	0.8	±0.04	1.4	3	1
* 8	7.4	+0.06/0.2	0.8	±0.04	1.6	3	1
* 9	8.4	+0.06/0.2	1	±0.05	1.8	3.2	1
* 10	9.3	±0.15	1	±0.05	1.8	3	1.2
* 11	10.2	±0.15	1	±0.05	2	3.1	1.2
* 12	11.1	±0.18	1	±0.05	2.1	3.2	1.5
* 13	12	±0.18	1	±0.05	2.1	3.3	1.5
* 14	12.9	±0.18	1	±0.05	2.2	3.4	1.7
* 15	13.8	±0.18	1	±0.05	2.2	3.5	1.7
16	14.7	±0.18	1	±0.05	2.2	3.6	1.7
17	15.7	±0.18	1	±0.05	2.2	3.7	1.7
18	16.5	±0.18	1.2	±0.06	2.6	3.8	1.7
19	17.5	±0.18	1.2	±0.06	2.7	3.8	2
20	18.5	±0.2	1.2	±0.06	2.7	3.9	2
21	19.5	±0.2	1.2	±0.06	2.7	4	2
22	20.5	±0.2	1.2	±0.06	2.7	4.1	2
* 23	21.4	±0.2	1.2	±0.06	2.9	4.5	2
24	22.2	±0.2	1.2	±0.06	3.1	4.2	2
25	23.2	±0.2	1.2	±0.06	3.1	4.3	2
26	24.2	±0.2	1.2	±0.06	3.1	4.4	2
* 27	25	±0.2	1.2	±0.06	3.3	4.5	2
28	25.9	±0.2	1.5	±0.06	3.1	4.6	2

To Be Continued

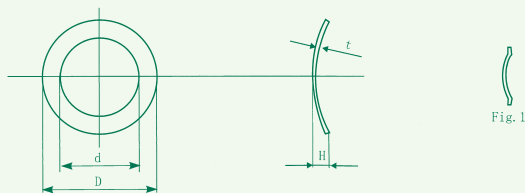


Retaining Rings (External) 定位介子 (外)

JIS B2804
unit : mm

Size-No. STW	Ring Dimension						
	d ₃		t		b	a	d ₀
	Basic	Tol.	Basic	Tol.	Approx.	Approx.	Min.
29	26.9	±0.2	1.5	±0.06	3.5	4.7	2
30	27.9	±0.2	1.5	±0.06	3.5	4.8	2
32	29.6	±0.2	1.5	±0.06	3.5	5	2.5
34	31.5	±0.25	1.5	±0.06	4	5.3	2.5
35	32.2	±0.25	1.5	±0.06	4	5.4	2.5
0 36	33.2	±0.25	1.75	±0.07	4	5.4	2.5
0 38	35.2	±0.25	1.75	±0.07	4.5	5.6	2.5
0 40	37	±0.4	1.75	±0.07	4.5	5.8	2.5
0 42	38.5	±0.4	1.75	±0.07	4.5	6.2	2.5
0 45	41.5	±0.4	1.75	±0.07	4.8	6.3	2.5
* 47	43.4	±0.4	1.75	±0.07	5	6.6	2.5
0 48	44.5	±0.4	1.75	±0.07	4.8	6.5	2.5
50	45.8	±0.4	2	±0.07	5	6.7	2.5
52	47.8	±0.4	2	±0.07	5	6.8	2.5
55	50.8	±0.45	2	±0.07	5	7	2.5
56	51.8	±0.45	2	±0.07	5	7	2.5

* Mark= Company's Specification
O Mark=JIS Standard



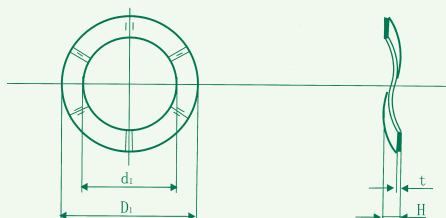
Curved Washer

Curved Washer 弧形介子

unit : mm

Size-No. MB	d		D		H		t
	Basic	Tol.	Basic	Tol.	Basic	Tol.	Min.
1711	1.7	+ 0.2/-0.1	3.7	±0.2	0.6	±0.2	0.1
3212	3.2	+ 0.2/-0.1	6.5	±0.2	1	±0.2	0.15
4001	4.1	+ 0.2/-0.1	10	±0.2	1.3	±0.2	0.2
4201	4.2	+ 0.2/-0.1	10	±0.2	1.2	±0.2	0.25
4301	4.3	+ 0.2/-0.1	6.8	±0.2	1	±0.2	0.15
4302	4.3	+ 0.2/-0.1	8	±0.2	1.2	±0.2	0.3
5011	5	±0.2	7.9	±0.2	1.2	±0.2	0.15
5211	5.2	±0.2	10	±0.2	1.2	±0.2	0.1
5301	5.3	±0.2	10	±0.2	1.4	±0.2	0.3
6201	6.2	±0.2	11	±0.2	1.2	±0.2	0.2
6203	6.2	±0.2	11	±0.2	1.4	±0.2	0.15
6301	6.3	±0.2	11	±0.2	1.5	±0.2	0.4
6411	6.4	±0.2	24	±0.3	2.5	±0.2	0.4
6511	6.5	±0.2	9.8	±0.2	1.2	±0.2	0.5
6811	6.8	±0.2	10.6	±0.2	1.8	±0.2	0.15
8302	8.5	±0.2	15	±0.3	2.3	±0.3	0.5
8501	8.5	±0.2	16	±0.3	3	±0.3	0.4
12511	12.5	±0.3	16.8	±0.3	2.2	±0.3	0.4
14501	14.5	±0.3	20	±0.3	3	±0.3	0.3
15900	15.9	±0.3	20	±0.3	1.3	±0.3	0.25
16601	16.6	±0.3	25	±0.3	2	±0.3	0.3

*No:16601 is made as fig.1

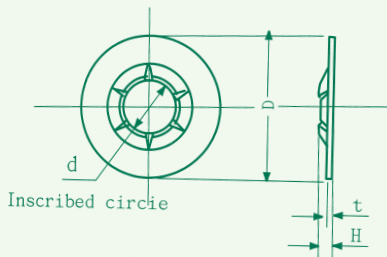


Wave Washer

Wave Washer 波浪介子

unit : mm

Size-No. WW	d1		D1		t		t	
	Basic	Tol.	Basic	Tol.	Basic	Tol.	Basic	Tol.
4	4.3	+0.3/-0.15	8	0/-0.5	1.5	+ 0.5/0	0.2	±0.02
5	5.4	+0.3/-0.15	9	0/-0.5	1.5	+ 0.5/0	0.3	±0.025
6	6.4	+0.3/-0.15	11	0/-0.5	1.5	+ 0.5/0	0.3	±0.025
8	8.5	+0.3/-0.15	12.5	0/-0.5	2	+ 0.5/0	0.3	±0.025
10	10.5	+0.3/-0.15	14.5	0/-0.5	2	+ 0.5/0	0.3	±0.025
12	12.5	+0.3/-0.15	17	0/-0.5	2.5	+ 0.7/0	0.3	±0.025
14	14.5	+0.3/-0.15	20	0/-0.5	2.5	+ 0.7/0	0.3	±0.025
16	16.7	+0.3/-0.15	22.5	0/-0.5	2.5	+ 0.7/0	0.3	±0.025
18	18.7	+0.3/-0.15	26	0/-0.5	3	+ 0.7/0	0.3	±0.025
20	20.7	+0.3/-0.15	29.1	0/-0.5	3	+ 0.7/0	0.3	±0.025
23	23.5	+0.5/-0.3	31	0/-0.8	3.5	+1/0	0.3	±0.025
26	26.4	+0.5/-0.3	34.2	0/-0.8	3.5	+1/-0.5	0.3	±0.025
30	30.4	+0.5/-0.3	39.3	0/-0.8	3.5	+1/-0.5	0.3	±0.025
32	33.8	+0.5/-0.3	46	0/-0.8	4.5	+1/-0.5	0.3	±0.025
38	39	+0.7/-0.05	51	0/-1.2	5	+1/-0.5	0.3	±0.025
40	40.6	+0.7/-0.05	53.5	0/-1.2	5	+1/-0.5	0.3	±0.025
46	47.5	+0.7/-0.05	61	0/-1.2	5.5	+1/-0.5	0.4	±0.03
50	51.4	+0.7/-0.5	67.5	0/-1.2	5.5	+1/-0.5	0.4	±0.03
53	54	+0.7/-0.5	69.8	0/-1.2	6	+1/-0.5	0.45	±0.03
60	61.9	+0.7/-0.5	79	0/-1.2	6.5	+1/-0.5	0.45	±0.03

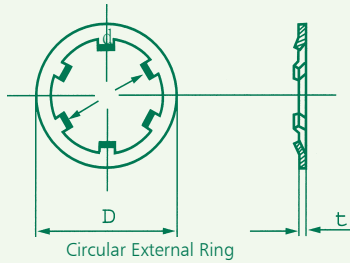


Self-locking External Ring

Self-locking External Rings 軸用定位介子

unit : mm

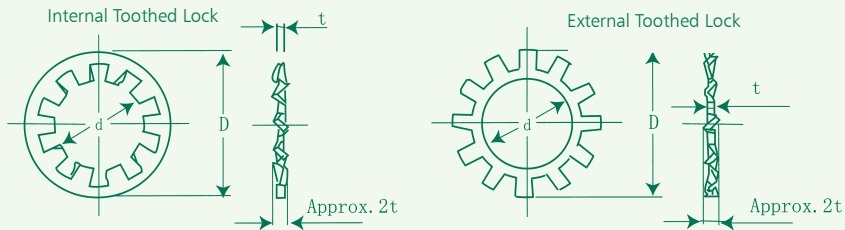
Size-No. SPN	Ring Dimension					Corresponding Applicable shaft		Thrust Load kgf
	d		D	H	t	Basic	Tol.	
	Basic	Tol.						
1.2	1.1	0 / -0.1	4.5	0.6	0.25	1.2	+0.04 / -0.03	20
1.5	1.4	0 / -0.1	5.2	0.6	0.25	1.5	+0.04 / -0.03	20
2	1.9	0 / -0.1	6	0.7	0.25	2	+0.04 / -0.03	20
2.4	2.3	0 / -0.15	7	0.8	0.25	2.4	+0.04 / -0.03	45
2.6	2.5	0 / -0.15	7	0.9	0.25	2.6	+0.04 / -0.03	45
3	2.9	0 / -0.15	10	1.3	0.3	3	+0.05 / -0.03	100
4	3.9	0 / -0.15	12	1.4	0.3	4	+0.05 / -0.03	100
5	4.9	0 / -0.15	14	1.55	0.4	5	+0.05 / -0.03	150
6	5.9	0 / -0.15	16	1.75	0.4	6	+0.06 / -0.03	170
8	7.9	0 / -0.15	17.5	1.8	0.5	8	+0.06 / -0.03	180
10	9.9	0 / -0.15	21	2.2	0.7	10	+0.07 / -0.03	320
12	11.9	0 / -0.15	27	2.8	0.9	12	+0.07 / -0.03	400



Circular External Rings 輕型軸用定位介子

unit : mm

Size-No. CRTW	Ring Dimension						Corresponding Shaft		Thrust Load kgf
	d		D		t	Nos. of Teeth	Basic	Tol.	
	Basic	Tol.	Basic	Tol.					
2	1.9	±0.05	6	±0.2	0.25	3	2	+0.03/0	6
2.4	2.2	+ 0.1/0	6.4	±0.2	0.25	3	2.4	±0.03	6
3	2.8	+0.1/0	8	±0.2	0.25	4	3	±0.03	9
3.5	3.3	0/- 0.1	7.5	±0.2	0.25	4	3.5	±0.03	10
4	3.8	+0.1/0	9	±0.2	0.25	4	4	±0.03	12
4.5	4.3	+0.1/0	10	±0.2	0.25	5	4.5	±0.03	14
5	4.8	+0.1/0	10	±0.2	0.25	5	5	±0.03	16
6	5.8	+0.1/0	11	±0.2	0.25	5	6	±0.03	18
8	7.8	+0.1/0	13	±0.2	0.25	5	8	±0.03	21
10	9.8	+0.1/0	15.4	±0.2	0.25	6	10	±0.03	23
12	11.8	+0.1/0	17.8	±0.3	0.4	6	12	±0.03	23
14	13.8	+0.1/0	20.3	±0.3	0.4	6	14	±0.05	23
16	15.8	+0.1/0	22.8	±0.3	0.4	6	16	±0.05	23
18	17.8	+0.1/0	25	±0.3	0.4	8	18	±0.05	25
19	18.7	±0.15	25.4	±0.3	0.4	6	19	±0.05	25
20	19.8	+0.1/0	28	±0.3	0.4	8	20	±0.05	25
22	21.7	±0.15	28.5	±0.3	0.4	6	22	±0.05	25

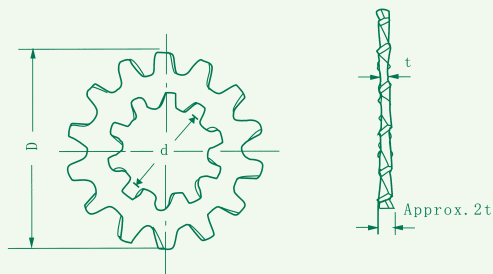


Toothed Lock Washers

Toothed Lock Washers 菊花齒介子

JIS B1255
unit : mm

Size-No.		Screw Size		d		D		t		Nos. of Teeth	
Int AW	Ext BW	mm	Inch	Basic	Tol.	Basic	Tol.	Basic	Tol.	Int	Ext
2	2	2	-	2.2	+ 0.2/0	4.8	0/-0.3	0.3	±0.025	7	8
2.3	2.3	2.3	-	2.5	+ 0.2/0	5.3	0/-0.3	0.3	±0.025	7	8
2.5	2.5	2.5(2.60)	-	2.7	+ 0.2/0	5.7	0/-0.3	0.3	±0.025	7	8
3	3	3	-	3.2	+ 0.2/0	6.5	0/-0.4	0.45	±0.035	7	8
3.5	3.5	3.5	-	3.7	+ 0.2/0	7.5	0/-0.4	0.45	±0.035	8	8
4	4	4	-	4.3	+ 0.2/0	8.5	0/-0.4	0.45	±0.035	8	8
4.5	4.5	4.5	-	4.8	+ 0.2/0	9.5	0/-0.4	0.5	±0.035	8	8
5	5	5	-	5.3	+ 0.2/0	10	0/-0.4	0.6	±0.04	8	10
6	6	6	-	6.4	+ 0.3/0	11	0/-0.5	0.6	±0.04	9	12
7	-	7	-	7.4	+ 0.3/0	13	0/-0.5	0.8	±0.05	10	-
8	8	8	-	8.4	+ 0.3/0	15	0/-0.5	0.8	±0.05	9	12
3/8	3/8	-	3/8	9.8	+ 0.3/0	17.5	0/-0.5	0.9	±0.05	9	12
10	10	10	-	10.5	+ 0.4/0	18	0/-0.5	0.9	±0.05	9	12
7/16	7/16	-	7/16	11.4	+ 0.4/0	19.5	0/-0.6	0.9	±0.05	10	12
12	12	12	-	12.5	+ 0.4/0	21	0/-0.6	1	±0.055	10	12
1/2	1/2	-	1/2	13	+ 0.4/0	22.5	0/-0.6	1	±0.055	10	12
14	14	14	-	14.5	+ 0.4/0	23	0/-0.6	1	±0.055	10	12
16	16	16	5/8	16.5	+ 0.4/0	26	0/-0.6	1.2	±0.065	12	14
18	18	18	-	19	+ 0.5/0	29	0/-0.6	1.2	±0.065	12	14
3/4	3/4	-	3/4	19.6	+ 0.5/0	32	0/-0.8	1.2	±0.065	12	14
20	20	20	-	21	+ 0.5/0	32	0/-0.8	1.4	±0.07	12	14



External-Internal Type

External - Internal type Toothed Lock Washers
菊花內外齒介子

JIS B1255
unit : mm

Size-No. ABW	Screw size		d		D		t		Nos. of Teeth	
	mm	Inch	Basic	Tol.	Basic	Tol.	Basic	Tol.	Internal	External
4	4	-	4.3	+ 0.2/0	15	0/-0.5	0.6	±0.04	8	12
4.5	4.5	-	4.8	+ 0.2/0	15	0/-0.5	0.6	±0.04	8	12
5	5	-	5.3	+ 0.2/0	15	0/-0.5	0.6	±0.04	8	12
5.5	5.5	-	5.8	+ 0.2/0	17.5	0/-0.5	0.8	±0.05	9	12
6	6	-	6.4	+ 0.3/0	17.5	0/-0.5	0.8	±0.05	9	12
8	8	-	8.4	+ 0.3/0	22.5	0/-0.6	0.9	±0.05	9	12
3/8	-	3/8	9.8	+ 0.3/0	26	0/-0.6	1	±0.055	9	14
10	10	-	10.5	+ 0.4/0	26	0/-0.6	1	±0.055	9	14
7/16	-	7/16	11.4	+ 0.4/0	29	0/-0.6	1	±0.055	10	14
12	12	-	12.5	+ 0.4/0	29	0/-0.6	1	±0.055	10	14
1/2	-	1/2	13	+ 0.4/0	32	0/-0.8	1.2	±0.065	10	14
14	14	-	14.6	+ 0.4/0	32	0/-0.8	1.2	±0.065	10	14
16	16	5/8	16.5	+ 0.4/0	35	0/-0.8	1.4	±0.07	12	16