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## Westfield Fasteners Product Specification:

### DIN 988 - Shim Washers

This product guide contains the specification for metric sized shim washers, a range of precision parts available from Westfield Fasteners. The basis of this specification is the DIN standard DIN 988.

#### Product Description

Shim washers or shim rings are a type of washer used as part of an assembly in order to prevent machine components from moving axially, and are often secured with circlips or lock washers. Being manufactured in a range of thicknesses and to high tolerances, they are employed as spacers to fill gaps and create level surfaces in an assembly.

These items allow for tighter and more precise alignment of machine parts, as well as being a load bearing surface. Shim washers should be located against smooth surfaces and not used where there is a step or chamfer, as there is a risk of the washer becoming deformed when used with an irregular surface.

#### Scope of the DIN Standard

DIN 988 states the dimensions, tolerances and approximate mass for steel shim washers. The most pertinent parts of this information are reproduced in figure 1 and tables 1 & 2 below.

#### Compatibility

These washers have been designed for use with the equivalent diameter metric washers, but there is no reason why they cannot be used in an assembly with imperial sized bolts or screws, provided that the relative diameters are a close enough match.

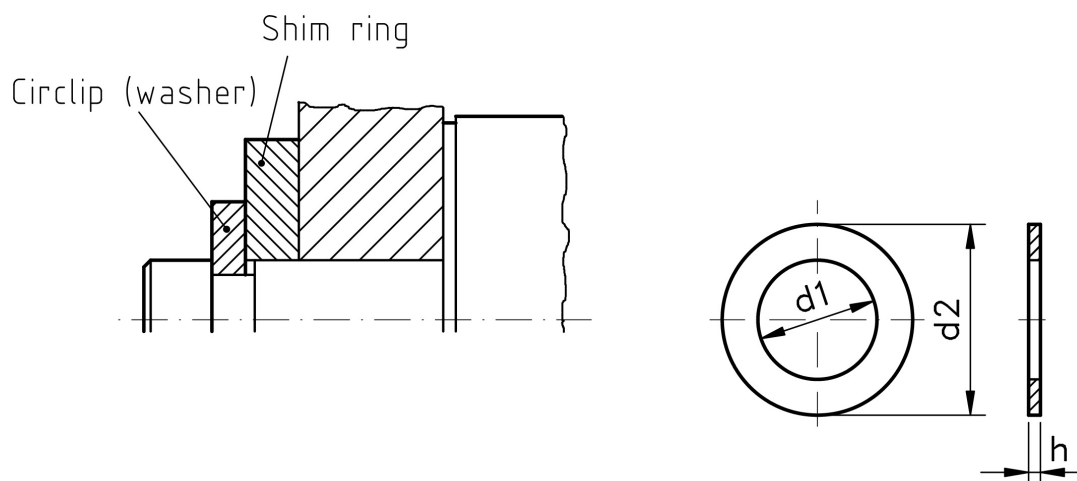


Figure 1: Shim Washer to DIN 988

**Table 1: Shim Washer Dimensions & Tolerances according to DIN 988 (mm)**

Inside diameter, d1 (D12)			Outside diameter, d2 (d12)		
Nominal Size	min.	max.	Nominal size	min.	max.
3	3.02	3.12	6	5.85	5.97
4	4.03	4.15	8	7.81	7.96
5	5.03	5.15	10	9.81	9.96
6	6.03	6.15	12	11.77	11.95
7	7.04	7.19	13	12.77	12.95
8	8.04	8.19	14	13.77	13.95
9	9.04	9.19	15	14.77	14.95
10	10.04	10.19	16	15.77	15.95
11	11.05	11.23	17	16.77	16.95
12	12.05	12.23	18	17.77	17.95
13	13.05	13.23	19	18.725	18.935
14	14.05	14.23	20	19.725	19.935
15	15.05	15.23	21	21.725	21.935
16	16.05	16.23	22	22.725	22.935
17	17.05	17.23	24	23.725	23.935
18	18.05	18.23	25	24.725	24.935
19	19.065	19.275	26	25.725	25.935
20	20.065	20.275	28	27.725	27.935
22	22.065	22.275	30	29.725	29.935
22	22.065	22.275	32	31.67	31.92
25	25.065	25.275	35	34.67	34.92
25	25.065	25.275	36	35.67	35.92
26	26.065	26.275	37	36.67	36.92
28	28.065	28.275	40	39.67	39.92
30	30.065	30.275	42	41.67	41.92
32	32.08	32.33	45	44.67	44.92
35	35.08	35.33	45	44.67	44.92
36	36.08	36.33	45	44.67	44.92
37	37.08	37.33	47	46.67	46.92
40	40.08	40.33	50	49.67	49.92
42	42.08	42.33	52	51.6	51.9
45	45.08	45.33	55	54.6	54.9
45	45.08	45.33	56	55.6	55.9
48	48.08	48.33	60	59.6	59.9
50	50.08	50.33	62	61.6	61.9
50	50.08	50.33	63	62.6	62.9
52	52.1	52.4	65	64.6	64.9
55	55.1	55.4	68	67.6	67.9
56	56.1	56.4	70	69.6	69.9
56	56.1	56.4	72	71.6	71.9
60	60.1	60.4	75	74.6	74.9
63	63.1	63.4	80	79.6	79.9
65	65.1	65.4	85	84.88	84.88
70	70.1	70.4	90	89.88	89.88
75	75.1	75.4	95	94.88	94.88

**Table 1: Shim Washer Dimensions & Tolerances continued**

Inside diameter, d1 (D12)			Outside diameter, d2 (d12)		
Nominal Size	min.	max.	Nominal size	min.	max.
80	80.1	80.4	100	99.88	99.88
85	85.12	85.47	105	104.88	104.88
90	90.12	90.47	110	109.88	109.88
95	95.12	95.47	115	114.88	114.88
100	100.12	100.47	120	119.88	119.88
100	100.12	100.47	125	124.455	124.855
105	105.12	105.47	130	129.455	129.855
110	110.12	110.47	140	139.455	139.855
120	120.12	120.47	150	149.455	149.855
130	130.145	130.545	160	159.455	159.855
140	140.145	140.545	170	169.455	169.855
150	150.145	150.545	180	179.455	179.855
160	160.145	160.545	190	189.37	189.83
170	170.145	170.545	200	199.37	199.83

**Table 2: Shim Washer Thickness Tolerance (mm)**

Thickness, h	
nom=max	min
0.1	0.07
0.15	0.12
0.2	0.16
0.3	0.25
0.5	0.45
1	0.95
1.1	1.05
1.2	1.15
1.3	1.25
1.4	1.35
1.5	1.45
1.6	1.55
1.7	1.65
1.8	1.75
1.9	1.85
2	1.95

For further details, please refer to the original DIN standard document for this item. E&OE