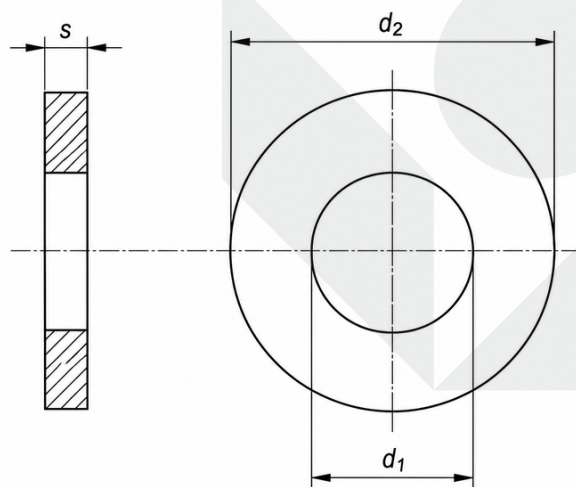


ISO 7089:2000

Plain washer, normal series

Plain washer without chamfer, providing a bearing surface under a bolt head or nut. Bore, outside diameter and thickness are distinct from the nominal bolt diameter.

ISO 7089 normal series, nominal sizes 1.6–64 mm, including dimensional limits. Nominal size identifies the mating bolt, not the bore diameter.



d_1 : bore diameter · d_2 : outside diameter · s : thickness (also designated h in technical references)

Identification drawing, not a manufacturing drawing.

Dimensional range

Dimensions in millimetres.

M	d1 min.	d2 max.	s
1.6	1.7	4	0.3
2	2.2	5	0.3
2.5	2.7	6	0.5
3	3.2	7	0.5
3.5	3.7	8	0.5
4	4.3	9	0.8
5	5.3	10	1
6	6.4	12	1.6
8	8.4	16	1.6
10	10.5	20	2
12	13	24	2.5
14	15	28	2.5
16	17	30	3
18	19	34	3
20	21	37	3
22	23	39	3
24	25	44	4
27	28	50	4
30	31	56	4
33	34	60	5
36	37	66	5
39	42	72	6
42	45	78	8
45	48	85	8
48	52	92	8
52	56	98	8
56	62	105	10
60	66	110	10
64	70	115	10

Dimensional limits

M	d1 max.	d2 min.	s min.	s max.
1.6	1.84	3.7	0.25	0.35
2	2.34	4.7	0.25	0.35
2.5	2.84	5.7	0.45	0.55
3	3.38	6.64	0.45	0.55
3.5	3.88	7.64	0.45	0.55
4	4.48	8.64	0.7	0.9
5	5.48	9.64	0.9	1.1
6	6.62	11.57	1.4	1.8
8	8.62	15.57	1.4	1.8
10	10.77	19.48	1.8	2.2
12	13.27	23.48	2.3	2.7
14	15.27	27.48	2.3	2.7
16	17.27	29.48	2.7	3.3
18	19.33	33.38	2.7	3.3
20	21.33	36.38	2.7	3.3
22	23.33	38.38	2.7	3.3
24	25.33	43.38	3.7	4.3
27	28.33	49.38	3.7	4.3
30	31.39	55.26	3.7	4.3
33	34.62	58.8	4.4	5.6
36	37.62	64.8	4.4	5.6
39	42.62	70.8	5.4	6.6
42	45.62	76.8	7	9
45	48.62	83.6	7	9
48	52.74	90.6	7	9
52	56.74	96.6	7	9
56	62.74	103.6	9	11
60	66.74	108.6	9	11
64	70.74	113.6	9	11

Materials and classes

Material	Class / hardness	M	Supply
Steel to mechanical specification	200 HV	M1.6–M64	On request
Steel to mechanical specification	300 HV	M1.6–M64	On request
A2 stainless steel	200 HV	M1.6–M64	On request
A4 stainless steel	200 HV	M1.6–M64	On request

Finishes and treatments

Finish	Material	Class	M
Plain / as manufactured	Steel to mechanical specification	200 HV	M1.6–M64
Plain / as manufactured	Steel to mechanical specification	300 HV	M1.6–M64
Electroplated zinc	Steel to mechanical specification	200 HV	M5–M36
Plain / as manufactured	A2 stainless steel	200 HV	M1.6–M64
Plain / as manufactured	A4 stainless steel	200 HV	M1.6–M64

Select the finish for the material/property-class combination. Hydrogen relief and lubrication are separate process requirements, not certificates and not implied by the coating name.

Standards, documents and enquiry

Hardness is separate from bolt property class: 200 HV or 300 HV for steel; 200 HV for A2/A4 in this specification. ISO 7089:2000 associates 200 HV with bolts up to 8.8 and nuts up to 8, and 300 HV with bolts up to 10.9 and nuts up to 10. Bearing conditions, environment and joint design must also be checked.

Commercial practice also includes class 8.8 bolts, class 8 nuts and 100 HV washers supplied to DIN 125 A / UNI 6592 references. Suitability must be checked against the joint conditions. For ISO 7089 washers, the reference hardness is 200 HV for bolts up to class 8.8 and nuts up to class 8, and 300 HV for bolts up to class 10.9 and nuts up to class 10. Commercial practice and standard requirements remain distinct.

DIN 125 A

Historical unchamfered-washer reference. Geometry, hardness and edition must be checked: a 100 HV washer is not automatically ISO 7089.

UNI 6592:1997

Withdrawn on 31 July 2001 and replaced by UNI EN ISO 7089:2001 and UNI EN ISO 7092:2001. Check the series, not just nominal size.

Supply documentation

Declaration of conformity; Material certificate; EN 10204 2.2 test report; EN 10204 3.1 inspection certificate; Dimensional inspection report; Coating report; Other documentation

Documents are subject to order agreement; no batch certificate is automatically included.

Related components

DIN 125 A, ISO 4014, ISO 4032. Match nominal diameter, pitch, strength, material, finish and joint conditions.

Request a quote

Specify standard, diameter, pitch and length where applicable, material, property class or hardness, finish, quantity and documents. Other sizes and dedicated production can be assessed on request, with agreed minimum quantities.

Reference technical configurations: these do not represent stock quantities.

Other materials and specifications

For requirements beyond the tabulated combinations, enquire about aluminium, brass, nylon, duplex, superduplex or an ASTM specification. Alloy or grade, dimensions, mechanical requirements and finish are defined for the enquiry; the geometric reference does not automatically imply conformity with the product standard.