UDC 621.882.42 DEUTSCHE NORM March 1990

Product grade A washers
with a hardness up to 250 HV
designed for use with hexagon head bolts and nuts

DIN 125 Part 1

Scheiben; Produktklasse A, bis Härte 250 HV, vorzugsweise für Sechskantschrauben und -muttern

This standard, together with DIN 125 Part 2, March 1990 edition, supersedes DIN 125, May 1968 edition.

In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.

Dimensions in mm

1 Scope and field of application

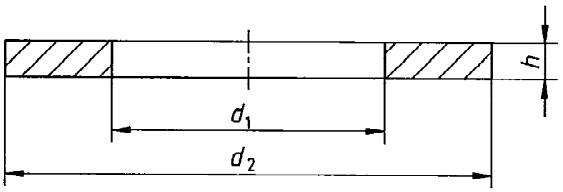
This standard specifies requirements for product grade A washers with a hardness up to 250 HV, designed for use with bolts of property class 8.8 or less. The preferred application of these washers is in product grades A and B hexagon head bolt/hexagon nut assemblies, with widths across flats as specified in ISO 272.

Note. The washer hardness shall be selected as a function of the assumed bearing pressure in the bolted assembly.

2 Dimensions

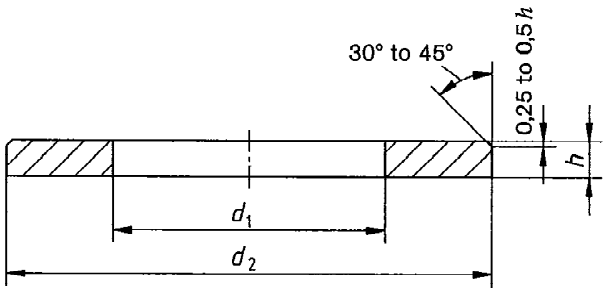
Type A, without chamfer

Commercial sizes: 1,7 mm to 37 mm.



Type B, with external chamfer

Commercial sizes: 5,3 mm to 165 mm.



Continued on pages 2 to 4

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Table 1.

Nominal size	For thread size M	Clearance hole diameter, d_1 min. = nominal size	Clearance hole diameter, d_1 max.	Outside diameter, d_2 max. = nominal size	Outside diameter, d_2 min.	Thickness, h Nominal size	Thickness, h max.	Thickness, h min.	Mass (7,85 kg/dm³) per 1000 units, in kg, ≈
1,7	1,6	1,7	1,84	4	3,7	0,3	0,35	0,25	0,024
1,8	1,7	1,8	1,94	4,5	4,2	0,3	0,35	0,25	0,031
2,2	2	2,2	2,34	5	4,7	0,3	0,35	0,25	0,037
2,5	2,3	2,5	2,64	6	5,7	0,5	0,55	0,45	0,092
2,7	2,5	2,7	2,84	6	5,7	0,5	0,55	0,45	0,088
2,8	2,6	2,8	2,94	7	6,64	0,5	0,55	0,45	0,127
3,2	3	3,2	3,38	7	6,64	0,5	0,55	0,45	0,119
3,7	3,5	3,7	3,88	8	7,64	0,5	0,55	0,45	0,155
4,3	4	4,3	4,48	9	8,64	0,8	0,9	0,7	0,308
5,3	5	5,3	5,48	10	9,64	1	1,1	0,9	0,443
6,4	6	6,4	6,62	12	11,57	1,6	1,8	1,4	1,02
7,4	7	7,4	7,62	14	13,57	1,6	1,8	1,4	1,39
8,4	8	8,4	8,62	16	15,57	1,6	1,8	1,4	1,83
10,5	10	10,5	10,77	20	19,48	2	2,2	1,8	3,57
13	12	13	13,27	24	23,48	2,5	2,7	2,3	6,27
15	14	15	15,27	28	27,48	2,5	2,7	2,3	8,62
17	16	17	17,27	30	29,48	3	3,3	2,7	11,3
19	18	19	19,33	34	33,38	3	3,3	2,7	14,7
21	20	21	21,33	37	36,38	3	3,3	2,7	17,2
23	22	23	23,33	39	38,38	3	3,3	2,7	18,3
25	24	25	25,33	44	43,38	4	4,3	3,7	32,3
27	26	27	27,33	50	49,38	4	4,3	3,7	43,7
28	27	28	28,33	50	49,38	4	4,3	3,7	42,3
29	28	29	29,33	50	49,38	4	4,3	3,7	40,9
31	30	31	31,39	56	55,26	4	4,3	3,7	53,6
33	32	33	33,62	60	58,8	5	5,6	4,4	77,4
34	33	34	34,62	60	58,8	5	5,6	4,4	75,3
36	35	36	36,62	66	64,8	5	5,6	4,4	94,3
37	36	37	37,62	66	64,8	5	5,6	4,4	92,1
39	38	39	39,62	72	70,8	6	6,6	5,4	136
40	39	40	40,62	72	70,8	6	6,6	5,4	133
41	40	41	41,62	72	70,8	6	6,6	5,4	130
43	42	43	43,62	78	76,8	7	8	6	183
46	45	46	46,62	85	83,6	7	8	6	220
50	48	50	50,62	92	90,6	8	9	7	294
52	50	52	52,74	92	90,6	8	9	7	284
54	52	54	54,74	98	96,6	8	9	7	330
57	55	57	57,74	105	103,6	9	10	8	431
58	56	58	58,74	105	103,6	9	10	8	425
60	58	60	60,74	110	108,6	9	10	8	472
62	60	62	62,74	110	108,6	9	10	8	458
66	64	66	66,74	115	113,6	9	10	8	492
70	68	70	70,74	120	118,6	10	11	9	586
74	72	74	74,74	125	123,4	10	11	9	626
78	76	78	78,74	135	133,4	10	11	9	749
82	80	82	82,87	140	138,4	12	13,2	10,8	953
87	85	87	87,87	145	143,4	12	13,2	10,8	996
93	90	93	93,87	160	158,4	12	13,2	10,8	1250
98	95	98	98,87	165	163,4	12	13,2	10,8	1300
104	100	104	104,87	175	173,4	14	15,2	12,8	1710
109	105	109	109,87	180	178,4	14	15,2	12,8	1770
114	110	114	114,87	185	183,15	14	15,2	12,8	1830
119	115	119	119,87	200	188,15	14	15,2	12,8	2230
124	120	124	125	210	208,15	16	17,2	14,8	2830
129	125	129	130	220	218,15	16	17,2	14,8	3130
134	130	134	135	220	218,15	16	17,2	14,8	3000
139	135	139	140	230	228,15	16	17,2	14,8	3310
144	140	144	145	240	238,15	18	19,2	16,8	4090
149	145	149	150	250	248,15	18	19,2	16,8	4470
155	150	155	156	250	24	18	19,2	16,8	4270
165	160	165	166	250	24	18	19,2	16,8	3910

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3 Technical delivery conditions

Table 2.

Material [1]		Steel		Stainless steel	
Mechanical properties	Hardness class	140 HV	200 HV	140 HV	200 HV
	Hardness [2] HV	140 to 250	200 to 250	140 to 250	200 to 250
	Material (steel group)	–		A2 and A4 F1 C1 and C4	
	As specified in	–		DIN 267 Part 11.	
Limit deviations and geometrical tolerances	Product grade	A			
	As specified in	DIN 522.			
Surface finish		Bright. DIN 522 shall apply with regard to surface roughness. DIN 267 Part 9 shall apply with regard to electroplating, any other types of finish being subject to agreement.			
Acceptance inspection		DIN 522 shall apply with regard to acceptance inspection.			

[1] Washers may be made of non-ferrous metals or other materials, subject to agreement.

[2] For h not exceeding 0,5 mm, the hardness shall be HV 2 and for h exceeding 0,5 mm, HV 10.

4 Designation

Designation of a type A or B washer of nominal size 13 and hardness class 140 HV [1]:

Washer DIN 125 – 13 – 140 HV

Where stainless steel washers are to be supplied, the steel grade as specified in DIN 267 Part 11 or the material number as specified in DIN 17440 shall be included in the designation:

Washer DIN 125 – 13 – 140 HV – A2

or

Washer DIN 125 – 13 – 140 HV – 1.4306

Where a particular washer type is desired (e.g. type A), the type symbol shall be included in the designation, e.g.:

Washer DIN 125 – A 13 – 140 HV

The DIN 4000-3-1 tabular layout of article characteristics shall apply for washers complying with this standard.

[1] This hardness class shall also be used where no material or only symbol 'St' is specified in existing documentation.

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Standards referred to

DIN	267 Part 9	Fasteners; technical delivery conditions; electroplated components
DIN	267 Part 11	Fasteners; technical delivery conditions; stainless and acid resistant steel components (with addenda to ISO 3506)
DIN	522	Metal washers; technical delivery conditions
DIN	4000 Part 3	Tabular layout of article characteristics for washers
DIN	17 440	Stainless steels; technical delivery conditions for plate and sheet, hot rolled strip, wire rod, drawn wire, steel bars, forgings and semi-finished products
ISO	272	Fasteners; hexagon products; widths across flats

Previous editions

DIN Kr 961: 01.36, 10.37; DIN Kr 963: 01.36, 10.37; DIN 134: 03.23, 10.36; DIN 125 Part 1: 02.21, 12.21, 03.23; DIN 125: 10.36, 05.43, 05.68.

Amendments

The following amendments have been made to the May 1968 edition.

a) DIN 125 has been split up into two standards, Part 1 and Part 2, the reasons being given in the Explanatory notes.
b) The title of the standard has been amended.
c) The outside diameters for nominal sizes 2,7, 6,4, 8,4 and 10,5 have been changed.
d) Nominal size 165 has been included.
e) Limits of size have been given on the basis of the tolerances specified.
f) Hardness classes have been introduced.
g) The technical delivery conditions have been revised.
h) The standard has been editorially revised.

Explanatory notes

In the case of hexagon head bolts and hexagon socket head cap screws, the design of the underhead fillet within the area defined by the minimum bearing face diameter, d_a, is at the manufacturer's discretion. This may occasionally result in an interference between bolt/screw and washer where the latter has a clearance hole made to the fine series as specified in ISO 273. Normally, such interference will pose no problems since, when the assembly is tightened, the washer undergoes deformation resulting in the washer being moulded to fit the shape of the underhead fillet. If washers of greater hardness are used, there is the risk that the edge of the washer will cut into the fillet and thus damage it.

Taking this into account, the responsible ISO Committee, TC 2, decided that the clearance hole edge should be provided with a chamfer or a radius to minimize the risk of such a damage. In line with this decision, the responsible technical committee in Germany deals with 'soft' and 'hard' washers in separate Parts of this standard to allow for the difference in performance of both washer types.

For washer sizes up to 37, the clearance hole diameter, outside diameter and washer thickness have been harmonized with the specifications given in the 1983 editions of ISO 7089*) and ISO 7090*) where such were available. At present, these ISO Standards or their revised versions (currently being prepared) cannot be adopted as DIN Standards since, in Germany, a considerably greater number of sizes is required than specified in the ISO Standards.

International Patent Classification

F 16 B 43/00

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