
International Standard



887

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Plain washers for metric bolts, screws and nuts — General plan

Rondelles plates pour boulonnerie métrique — Plan général

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 887 was developed by Technical Committee ISO/TC 2, *Fasteners*, and was circulated to the member bodies in December 1981.

It has been approved by the member bodies of the following countries:

Australia	Hungary	Norway
Austria	India	Romania
Belgium	Ireland	South Africa, Rep. of
China	Italy	Spain
Czechoslovakia	Japan	Sri Lanka
Denmark	Korea, Dem. P. Rep. of	Sweden
Egypt, Arab Rep. of	Korea, Rep. of	Switzerland
Finland	Mexico	United Kingdom
France	Netherlands	USSR
Germany, F. R.	New Zealand	

The member bodies of the following countries expressed disapproval of the document on technical grounds:

Canada
USA

This International Standard cancels and replaces ISO Recommendation R 887-1968, of which it constitutes a technical revision.

Plain washers for metric bolts, screws and nuts — General plan

1 Scope and field of application

This International Standard lays down the specification for the full range of plain washers of product grades A and C for bolts, screws and nuts with thread sizes from M 1 to M 150 inclusive.

This International Standard does not apply to washers for preassembled bolts and screws as far as the hole diameters are concerned.

NOTE — Washers for structural bolting will be incorporated into this International Standard as soon as agreement has been reached.

2 References

ISO 273, *Fasteners — Clearance holes for bolts and screws.*

ISO 4759/3, *Tolerances for fasteners — Part 3: Washers for metric bolts, screws and nuts with thread diameters from 1 up to and including 150 mm — Product grades A and C.*

ISO 7089, *Plain washers — Normal series — Product grade A.*

ISO 7090, *Plain washers, chamfered — Normal series — Product grade A.*

ISO 7091, *Plain washers — Normal series — Product grade C.*

ISO 7092, *Plain washers — Small series — Product grade A.*

ISO 7093, *Plain washers — Large series — Product grades A and C.*

ISO 7094, *Plain washers — Extra large series — Product grade C.*

3 Clearance holes

The clearance holes for washers should be chosen in accordance with those specified in ISO 273, i.e. fine series for all types of washers of product grade A and medium series for all types of washers of product grade C. However, for grade A washers of 6 mm thickness and over, the clearance hole medium series is applicable.

NOTE — Product grade C does not apply to stainless steel washers.

4 Outside diameters

The outside diameters for washers should be chosen from the following series.

Values in millimetres

2,5	8	18	39	80	125	190
3	9	20	44	85	135	200
3,5	10	22	50	92	140	210
4	11	24	56	98	145	220
4,5	12	28	60	105	160	230
5	14	30	66	110	165	240
6	15	34	72	115	175	250
7	16	37	78	120	180	

5 Thicknesses

The thicknesses for washers should be chosen from the following series.

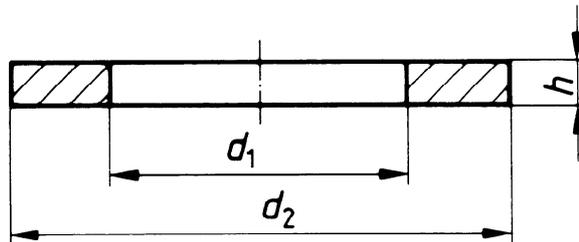
Values in millimetres

0,3	1	2	4	8	14
0,5	1,2	2,5	5	10	16
0,8	1,6	3	6	12	18

6 Tolerances

The tolerances for washers should be chosen in accordance with those specified in ISO 4759/3.

7 Preferred combinations for plain washers



Dimensions in millimetres

Nominal size (Thread size <i>d</i>)	<i>d</i> ₁		Series															
			small			normal			interim		large			extra large				
	Grade		<i>d</i> ₂	<i>h</i>	ISO 7092 Grade A	<i>d</i> ₂	<i>h</i>	ISO 7089 Grade A	ISO 7090 Grade A	ISO 7091 Grade C	<i>d</i> ₂	<i>h</i>	<i>d</i> ₂	<i>h</i>	ISO 7093 Grades A and C	<i>d</i> ₂	<i>h</i>	ISO 7094 Grade C
A ¹⁾	C																	
1	1,1	1,2	2,5	0,3		3	0,3											
1,2	1,3	1,4	3	0,3		3,5	0,3											
1,4	1,5	1,6	3	0,3		4	0,3											
1,6	1,7	1,8	3,5	0,3	×	4	0,3	×				5	0,3					
1,8	2	2,1	4	0,3		4,5	0,3					—	—					
2	2,2	2,4	4,5	0,3	×	5	0,3	×				6	0,5					
2,2	2,4	2,6	4,5	0,3		6	0,5					—	—					
2,5	2,7	2,9	5	0,5	×	6	0,5	×				8	0,5					
3	3,2	3,4	6	0,5	×	7	0,5	×				9	0,8	×				
3,5	3,7	3,9	7	0,5	×	8	0,5	×			9	0,5	11	0,8	×			
4	4,3	4,5	8	0,5	×	9	0,8	×			10	0,8	12	1	×			
4,5	4,8	5	9	0,8		10	0,8				—	—	15	1				
5	5,3	5,5	9	1	×	10	1	×	×	×	12	1	15	1,2	×	18	2	×
6	6,4	6,6	11	1,6	×	12	1,6	×	×	×	15	1,2	18	1,6	×	22	2	×
7	7,4	7,6	12	1,6		14	1,6				—	—	22	2		24	2	
8	8,4	9	15	1,6	×	16	1,6	×	×	×	20	1,6	24	2	×	28	3	×
10	10,5	11	18	1,6	×	20	2	×	×	×	24	2	30	2,5	×	34	3	×
12	13	13,5	20	2	×	24	2,5	×	×	×	30	2,5	37	3	×	44	4	×
14	15	15,5	24	2,5	×	28	2,5	×	×	×	—	—	44	3	×	50	4	×
16	17	17,5	28	2,5	×	30	3	×	×	×	39	3	50	3	×	56	5	×
18	19	20	30	3		34	3				—	—	56	4		60	5	
20	21	22	34	3	×	37	3	×	×	×	50	3	60	4	×	72	6	×
22	23	24	37	3		39	3				50	3	66	5	×	80	6	×
24	25	26	39	4	×	44	4	×	×	×	—	—	72	5	×	85	6	×
27	28	30	44	4		50	4				—	—	85	6		98	6	
30	31	33	50	4	×	56	4	×	×	×	—	—	92	6	×	105	6	×
33	34	36	56	5		60	5				—	—	105	6		115	8	
36	37	39	60	5	×	66	5	×	×	×	—	—	110	8	×	125	8	×
39		42	72	6		72	6				—	—	120	8		140	10	
42		45	78	8		78	8				—	—	125	10				
45		48	85	8		85	8				—	—	135	10				
48		52	92	8		92	8				—	—	145	10				
52		56	98	8		98	8				—	—	160	10				
56		62	105	10		105	10				—	—						
60		66	110	10		110	10				—	—						
64		70	115	10		115	10				—	—						
68		74	120	10		120	10				—	—						
72		78	125	10		125	10				—	—						
76		82	135	10		135	10				—	—						
80		86	140	12		140	12				—	—						
85		91	145	12		145	12				—	—						
90		96	160	12		160	12				—	—						
95		101	165	12		165	12				—	—						
100		107	175	14		175	14				—	—						
105		112	180	14		180	14				—	—						
110		117	185	14		185	14				—	—						
115		122	200	14		200	14				—	—						
120		127	210	16		210	16				—	—						
125		132	220	16		220	16				—	—						
130		137	230	16		230	16				—	—						
140		147	240	18		240	18				—	—						

1) Washers grade A, of 6 mm thickness and over have clearance holes, medium series.

NOTE — This table has been expanded by comparison with those in ISO 7089, ISO 7092, ISO 7093 and ISO 7094. Crosses indicate washers defined in the corresponding International Standards.

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