International Standard ISO 7089

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Plain washers — Normal series — Product grade A

Rondelles plates — Série normale — Grade A

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Price based on 3 pages

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 7089 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
Austria
Belgium
China
Czechoslovakia
Denmark
Egypt, Arab Rep. of
Finland
Germany, F.R.
Hungary
India
Ireland
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Korea, Rep. of
Mexico
Netherlands
New Zealand
Norway
Poland
Romania
South Africa, Rep. of
Spain
Sweden
Switzerland
United Kingdom
USSR

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

Canada
France
USA

Printed in Switzerland

Plain washers — Normal series — Product grade A

1 Scope and field of application

This International Standard lays down the specification for plain washers of product grade A, preferable for hexagon bolts, screws and nuts of product grades A and B with normal width across flats according to ISO 272, with thread sizes from M 1,6 to M 36 inclusive.

When soft material pieces are tightened, or large clearance holes are used, the user shall check the technical suitability of this standard washer.

2 References

ISO 272, *Fasteners — Hexagon products — Widths across flats.*

ISO 887, *Plain washers for metric bolts, screws and nuts — General plan.*

ISO 1456, *Metallic coatings — Electroplated coatings of nickel plus chromium.*

ISO 1457, *Metallic coatings — Electroplated coatings of copper plus nickel plus chromium on iron or steel.*

ISO 1458, *Metallic coatings — Electroplated coatings of nickel.*

ISO 2081, *Metallic coatings — Electroplated coatings of zinc on iron or steel.*[1)]

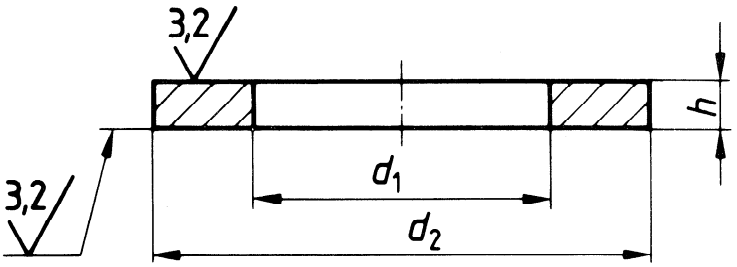
ISO 3269, *Fasteners — Acceptance inspection.*[2)]

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.*

1) At present at the stage of draft. (Revision of ISO 2081-1973.)

2) At present at the stage of draft.

3 Dimensions



Dimensions in millimetres

Nominal size (Thread size, d)	Clearance hole d_1		Outside diameter d_2		Thickness h		
	nom. (min.)	max.	nom. (max.)	min.	nom.	max.	min.
1,6	1,7	1,84	4	3,7	0,3	0,35	0,25
2	2,2	2,34	5	4,7	0,3	0,35	0,25
2,5	2,7	2,84	6	5,7	0,5	0,55	0,45
3	3,2	3,38	7	6,64	0,5	0,55	0,45
3,5	3,7	3,88	8	7,64	0,5	0,55	0,45
4	4,3	4,48	9	8,64	0,8	0,9	0,7
5	5,3	5,48	10	9,64	1	1,1	0,9
6	6,4	6,62	12	11,57	1,6	1,8	1,4
8	8,4	8,62	16	15,57	1,6	1,8	1,4
10	10,5	10,77	20	19,48	2	2,2	1,8
12	13	13,27	24	23,48	2,5	2,7	2,3
14	15	15,27	28	27,48	2,5	2,7	2,3
16	17	17,27	30	29,48	3	3,3	2,7
20	21	21,33	37	36,38	3	3,3	2,7
24	25	25,33	44	43,38	4	4,3	3,7
30	31	31,39	56	55,26	4	4,3	3,7
36	37	37,62	66	64,8	5	5,6	4,4

4 Specifications and reference International Standards

Material[1]		Steel			Austenitic stainless steel		
Mechanical properties	Classes	140 HV	200 HV	300 HV[2]	A 140	A 200	A 350
	International Standards	3)			3)		
	Hardness HV	140 min.	200 — 300	300 — 400	140 min.	200 — 300	350 — 400
Tolerances	Product grade	A					
	International Standard	ISO 4759/3					
Surface finish		Plain, deburred Requirements for electroplating are given in ISO 1456, ISO 1457, ISO 1458, and ISO 2081. If different electroplating requirements are needed for other finishes, they should be negotiated between customer and supplier.					
Acceptability		The acceptance procedure is covered in ISO 3269.					

1) Non-ferrous and other materials as agreed.
2) Hardened and tempered.
3) Will be covered in a future International Standard.

5 Designation

Example for the designation of a plain washer, normal series, of nominal size 8 mm and mechanical property class 140 HV:

Washer ISO 7089 - 8 - 140 HV

Example for the designation of a plain washer, normal series, of nominal size 8 mm and mechanical property class A 140:

Washer ISO 7089 - 8 - A 140

Annex

(This annex does not form part of the standard.)

Dimensions for nominal sizes 10, 12 and 14 mm are shown for hexagon products with width across flats as mentioned in the annexes to the relevant product standards.

A transitional period is anticipated in which there will be some use of washers with dimensions shown in light type. The information is included to assist during the transitional period.

Dimensions in millimetres

Nominal diameter (Nominal thread diameter, *d*)	**Width across flats** *s*	**Clearance hole** d_1		**Outside diameter** d_2		**Thickness** *h*		
		nom. (min.)	max.	nom. (max.)	min.	nom.	max.	min.
10	15	10,5	10,77	19	18,48	2	2,2	1,8
	16	**10,5**	**10,77**	**20**	**19,48**	**2**	**2,2**	**1,8**
	17	10,5	10,77	21	20,48	2	2,2	1,8
12	**18**	**13**	**13,27**	**24**	**23,48**	**2,5**	**2,7**	**2,3**
	19							
14	**21**	**15**	**15,27**	**28**	**27,48**	**2,5**	**2,7**	**2,3**
	22							

NOTE — The figures in bold type are laid down in this International Standard.

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