
International Standard 7093

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

Plain washers — Large series — Product grades A and C

Rondelles plates — Série large — Grades A et C

First edition — 1983-09-15

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UDC 621.882.4

Ref. No. ISO 7093-1983 (E)

Descriptors : washers, plain washers, dimensions, designation, specifications.

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 7093 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	India	Poland
Austria	Ireland	Romania
Belgium	Italy	South Africa, Rep. of
China	Japan	Spain
Czechoslovakia	Korea, Dem. P. Rep. of	Sweden
Denmark	Korea, Rep. of	Switzerland
Egypt, Arab Rep. of	Mexico	United Kingdom
Finland	Netherlands	USSR
Germany, F. R.	New Zealand	
Hungary	Norway	

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

Canada
France
USA

Plain washers — Large series — Product grades A and C

1 Scope and field of application

This International Standard lays down the specification for plain washers of product grades A and C with outside diameter three times nominal size (nominal thread diameter), preferable for hexagon bolts, screws and nuts with width across flats according to ISO 272, with thread sizes from M 3 to M 36 inclusive.

2 References

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⁾

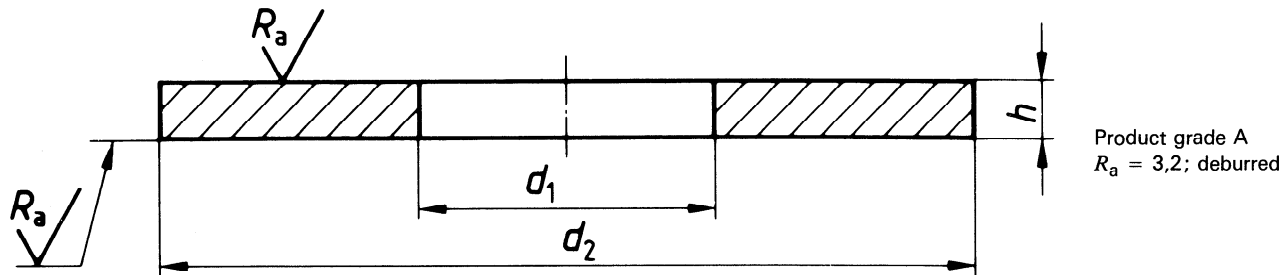
ISO 3269, *Fasteners — Acceptance inspection.*²⁾

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.
3	3,2	3,38	9	8,64	0,8	0,9	0,7
3,5	3,7	3,88	11	10,57	0,8	0,9	0,7
4	4,3	4,48	12	11,57	1	1,1	0,9
5	5,3	5,48	15	14,57	1,2	1,4	1
6	6,4	6,62	18	17,57	1,6	1,8	1,4
8	8,4	8,62	24	23,48	2	2,2	1,8
10	10,5	10,77	30	29,48	2,5	2,7	2,3
12	13	13,27	37	36,38	3	3,3	2,7
14	15	15,27	44	43,38	3	3,3	2,7
16	17	17,27	50	49,38	3	3,3	2,7
20	22	22,52	60	58,1	4	4,6	3,4
24	26	26,84	72	70,1	5	6	4
30	33	34	92	89,8	6	7	5
36	39	40	110	107,8	8	9,2	6,8

4 Specifications and reference International Standards

Material ¹⁾	Steel	Austenitic stainless steel
Classes	Grade A: 140 HV Grade C: 100 HV	A 140
Mechanical properties	International Standards	2)
	Hardness HV	140 min.
Tolerances	Product grades	A
	International Standard	ISO 4759/3
Surface finish	Plain 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) Will be covered by a future International Standard.

5 Designation

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

Washer ISO 7093 - 8 - 140 HV

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

Washer ISO 7093 - 8 - A 140

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