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# International Standard 7090

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

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## Plain washers, chamfered — Normal series — Product grade A

*Rondelles plates, chanfreinées — Série normale — Grade A*

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**Descriptors :** washers (spacers), 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 7090 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	Sri Lanka
Denmark	Korea, Rep. of	Sweden
Egypt, Arab Rep. of	Mexico	Switzerland
Finland	Netherlands	United Kingdom
Germany, F. R.	New Zealand	USSR
Hungary	Norway	

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

Canada  
France  
USA

# Plain washers, chamfered — Normal series — Product grade A

## 1 Scope and field of application

This International Standard lays down the specification for chamfered 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 5 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.*<sup>1)</sup>

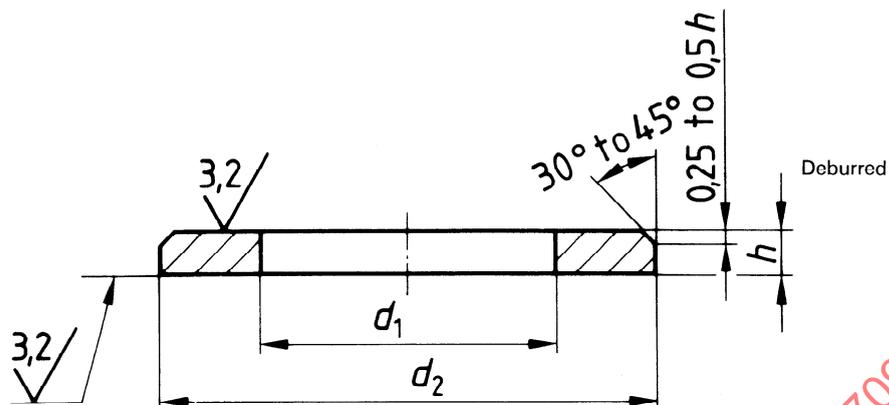
ISO 3269, *Fasteners — Acceptance inspection.*<sup>2)</sup>

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.
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 <sup>1)</sup>	Steel			Austenitic stainless steel			
	Classes	140 HV	200 HV	300 HV <sup>2)</sup>	A 140	A 200	A 350
Mechanical properties	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 chamfered plain washer, normal series, of nominal size 8 mm and mechanical property class 140 HV:

**Washer ISO 7090 - 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 7090 - 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 size (Thread size, <i>d</i> )	Width across flats <i>s</i>	Clearance hole <i>d</i> <sub>1</sub>		Outside diameter <i>d</i> <sub>2</sub>		Thickness <i>h</i>		
		nom. (min.)	max.	nom. (max.)	min.	nom.	max.	min.
10	15	10,5	10,77	19	18,48	2	2,2	1,8
	<b>16</b>	<b>10,5</b>	<b>10,77</b>	<b>20</b>	<b>19,48</b>	<b>2</b>	<b>2,2</b>	<b>1,8</b>
	17	10,5	10,77	21	20,48	2	2,2	1,8
12	<b>18</b>	<b>13</b>	<b>13,27</b>	<b>24</b>	<b>23,48</b>	<b>2,5</b>	<b>2,7</b>	<b>2,3</b>
	19							
14	<b>21</b>	<b>15</b>	<b>15,27</b>	<b>28</b>	<b>27,48</b>	<b>2,5</b>	<b>2,7</b>	<b>2,3</b>
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NOTE — The figures in bold type are laid down in this International Standard.

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