

## Washers for use in structural steelwork

Part 1: Product grade C

**DIN**  
7989-1

ICS 21.060.30

**SWS 2264**

Scheiben für Stahlkonstruktionen – Teil 1: Produktklasse C

This standard, together with DIN 7989-2, April 2001 edition, supersedes DIN 7989, July 1974 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.*

## Foreword

This standard has been prepared by Technical Committees *Schraubenverbindungen für den Stahlbau* and *Scheiben und Ringe* of the *Normenausschuss Mechanische Verbindungselemente* (Fasteners Standards Committee).

## Amendments

This standard differs from DIN 7989, July 1974 edition, as follows:

- a) The standard now consists of two parts, Part 1 covering product grade C washers and Part 2 product grade A washers.
- b) The nominal size of washers is now based on the thread size.
- c) Washers for thread sizes M22, M33 and M36 are no longer included.
- d) Some values of  $d_1$  and  $d_2$  have been amended.
- e) For tolerances, DIN EN ISO 4759-3 shall apply.
- f) A thickness variation on the same part and a tolerance on flatness have been specified.
- g) A hardness class has been specified.
- h) The specifications relating to surface finish have been amended.

## Previous editions

Supplement 2 to DIN 1050: 1943-12; DIN 7989: 1956-10, 1974-07.

All dimensions are in millimetres.

## 1 Scope

This standard specifies dimensions and technical delivery conditions for punched plain washers of product grade C for use in structural steelwork (in accordance with DIN 18800-1), suitable for use with bolts, screws and nuts as in DIN 7968, DIN 7969, DIN 7990, DIN EN ISO 4032, and DIN EN ISO 4034.

NOTE: See DIN 7989-2 for washers of product grade A.

Continued on pages 2 and 3.

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original should be consulted as the authoritative text.

## 2 Normative references

This standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the titles of the publications are listed below. For dated references, subsequent amendments to or revisions of any of these publications apply to this standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

DIN 267-10	Fasteners – Technical delivery conditions – Hot-dip galvanized components
DIN 4000-3	Tabular layouts of article characteristics for washers
DIN 7968	Hexagon fit bolts for structural steel bolting for supply with or without nut
DIN 7969	Slotted countersunk head screws for structural steel bolting for supply with or without nut
DIN 7990	Hexagon head bolts for structural steel bolting for supply with nut
DIN 18800-1	Structural steelwork – Design and construction
DIN EN ISO 3269	Fasteners – Acceptance inspection (ISO 3269 : 2000)
DIN EN ISO 4032	Hexagon nuts, style 1 – Product grades A and B (ISO 4032 : 1999)
DIN EN ISO 4034	Hexagon nuts – Product grade C (ISO 4034 : 1999)
DIN EN ISO 4759-3	Tolerances for fasteners – Part 3: Plain washers for bolts, screws and nuts – Product grades A and C (ISO 4759-3 : 2000)

## 3 Dimensions

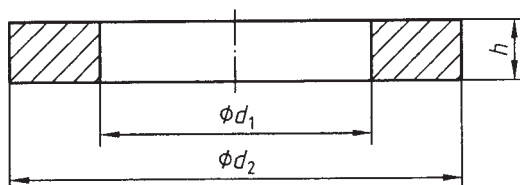


Figure 1: Washer dimensions (notation)

Table 1: Washer dimensions

Nominal size (thread size)	Hole diameter, $d_1$		Outside diameter, $d_2$		Thickness, $h$	Approx. mass, in kg, per 1 000 units
	Minimum	Maximum	Maximum	Minimum		
<b>M10</b>	11	11,70	20	18,7	$8 \pm 1,2$	13,8
<b>M12</b>	13,5	14,20	24	22,7		19,4
<b>M16</b>	17,5	18,20	30	28,7		29,3
<b>M20</b>	22	22,84	37	35,4		43,7
<b>M24</b>	26	26,84	44	42,4		62,1
<b>M27</b>	30	30,84	50	48,4		78,9
<b>M30</b>	33	34	56	54,1		101

## 4 Technical delivery conditions

**Table 2: Technical delivery conditions**

Material		Steel
Mechanical properties	Hardness class	100 HV
	Vickers hardness HV 10	100 to 250
Limit deviations and geometrical tolerances	Product grade	C <sup>1)</sup>
	As specified in	DIN EN ISO 4759-3.
Surface finish		Plain DIN 267-10 shall apply with regard to hot-dip galvanizing.
Acceptance inspection		As specified in DIN EN ISO 3269.
<sup>1)</sup> However, the thickness variation on the same part, $\Delta h$ , shall not exceed 0,6 mm and the tolerance on flatness, $t_1$ , shall be 1,2 mm.		

## 5 Designation

Designation of a washer of product grade C, of nominal size 12 mm and hardness class 100 HV<sup>1)</sup>:

Washer DIN 7989 – 12 – C – 100 HV

The DIN 4000-3-1 tabular layout of article characteristics shall apply to washers covered in this standard.

<sup>1)</sup> Hardness class 100 HV shall also be used where no material or only the symbol 'St' is specified in existing documentation.