

Copper and copper alloys — Hollow rod for free machining purposes

The European Standard EN 12168:1998, with the incorporation of amendment A1:2000, has the status of a British Standard

ICS 77.150.30

National foreword

This British Standard is the English language version of EN 12168:1998, including amendment A1:2000, published by the European Committee for Standardization (CEN).

The UK participation in its preparation was entrusted by Technical Committee NFE/34, Copper and copper alloys, to Subcommittee NFE/34/1, Wrought and unwrought copper and copper alloys, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 21 and a back cover.

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English version

Copper and copper alloys — Hollow rod for free machining purposes

(includes amendment A1:2000)

Cuivre et alliages de cuivre — Barres creuses pour
décolletage
(inclut l'amendement A1:2000)

Kupfer and Kupferlegierungen — Hohlstangen für
die spanende Bearbeitung
(enthält Änderung A1:2000)

This European Standard was approved by CEN on 2 January 1998. Amendment A1 was approved by CEN on 22 April 2000.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 133, Copper and copper alloys, the Secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 1998, and conflicting national standards shall be withdrawn at the latest by July 1998.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 4, Rod/bar, wire, profiles, to prepare the following standard:

EN 12168, *Copper and copper alloys — Hollow rod for free machining purposes*.

This is one of a series of European Standards for copper and copper alloy products in rod, wire and profile form. Other products are specified as follows:

EN 12163, *Copper and copper alloys — Rod for general purposes*.

EN 12164, *Copper and copper alloys — Rod for free machining purposes*.

EN 12165, *Copper and copper alloys — Wrought and unwrought forging stock*.

EN 12166, *Copper and copper alloys — Wire for general purposes*.

EN 12167, *Copper and copper alloys — Profiles and rectangular bar for general purposes*.

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Foreword to amendment A1

This amendment EN 12168:1998/A1:2000 to EN 12168:1998 has been prepared by Technical Committee CEN/TC 133, Copper and copper alloys, the Secretariat of which is held by DIN.

This amendment to the European Standard EN 12168:1998 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2000, and conflicting national standards shall be withdrawn at the latest by November 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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Introduction

The materials specified in this standard are those which are especially suitable for free machining purposes and the hollow rod is therefore manufactured to tight dimensional tolerances.

Requirements were previously included in this standard for two alloys, namely CuZn39Pb2Sn (CW613N) and CuZn40Pb2Sn (CW619N), which because of their higher permitted levels of tin, iron and aluminium, had inferior machinability to CuZn39Pb2 (CW612N) and CuZn40Pb2 (CW617N) respectively. In view of this CEN/TC 133 decided to withdraw these alloys from the standard but allowed sufficient time for their phasing out from production. These alloys, CuZn39Pb2Sn (CW613N) and CuZn40Pb2Sn (CW619N), were deleted from the standard on 1 January 2000.

1 Scope

This European Standard specifies the composition, property requirements and dimensional tolerances for copper alloy hollow rod supplied in straight lengths, specifically intended for free machining purposes.

NOTE Hollow products having an outside diameter greater than 80 mm, and/or a wall thickness less than 2 mm, are specified in prEN 12449.

The sampling procedures, the methods of test for verification of conformity to the requirements of this standard, and the delivery conditions are also specified.

2 Normative references

This European 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 publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 1655, *Copper and copper alloys — Declarations of conformity*.

EN 10003-1, *Metallic materials — Brinell hardness test — Part 1: Test method*.

EN 10204, *Metallic products — Types of inspection documents*.

EN ISO 196, *Wrought copper and copper alloys — Detection of residual stress — Mercury (I) nitrate test*. (ISO 196:1978)

EN ISO 6509:1995, *Corrosion of metals and alloys — Determination of dezincification resistance of brass*. (ISO 6509:1981)

ISO 1811-2, *Copper and copper alloys — Selection and preparation of samples for chemical analysis — Part 2: Sampling of wrought products and castings*.

ISO 6507-1, *Metallic materials — Hardness test — Vickers test — Part 1: HV 5 to HV 100*.

ISO 6957, *Copper alloys — Ammonia test for stress corrosion resistance*.

NOTE Informative references to documents used in the preparation of this standard, and cited at appropriate places in the text, are listed in a bibliography, see annex A.

3 Definitions

For the purposes of this standard, the following definitions apply.

3.1

hollow rod

wrought, straight product, of uniform cross-section along its whole length with an enclosed void. The longitudinal axes of the external form of the rod and its internal form, which is the boundary with the enclosed void, are coincidental. The external and internal contours of the rod, at any cross-section, can be round, square, rectangular, hexagonal, or octagonal, or with slight modification of those basic shapes by inclusion of detail(s) of relatively small size to the remainder of the cross-section. The product is intended specifically for free machining purposes

NOTE Examples of hollow rod cross-sections are shown in Figure 1.

3.2

circularity (round hollow rod)

difference between the maximum and the minimum external diameters measured at any one cross-section of a round hollow rod

3.3

eccentricity

difference between the maximum and the minimum wall thickness, measured in the same plane perpendicular to the axis of the hollow rod, expressed as a percentage of the sum of the maximum and minimum wall thicknesses; for polygons, wall thickness is measured perpendicular to the mid-points of the flat outside surfaces

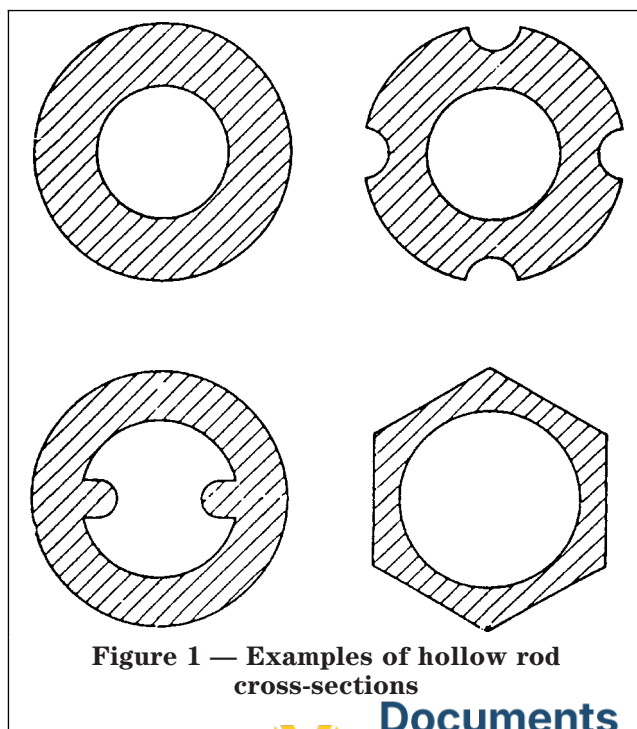


Figure 1 — Examples of hollow rod cross-sections

4 Designations

4.1 Material

4.1.1 General

The material is designated either by symbol or number (see Tables 1 to 3).

4.1.2 Symbol

The material symbol designation is based on the designation system given in ISO 1190-1.

NOTE Although material symbol designations used in this standard might be the same as those in other standards using the designation system given in ISO 1190-1, the detailed composition requirements are not necessarily the same.

4.1.3 Number

The material number designation is in accordance with the system given in EN 1412.

4.2 Material condition

For the purposes of this standard, the following designations, which are in accordance with the system given in EN 1173, apply for the material condition:

M	Material condition for the product as manufactured without specified mechanical properties;
H...	Material condition designated by the minimum value of hardness requirement for the product with mandatory hardness requirements; NOTE 1 Products in the H... condition may be specified to Brinell or Vickers hardness. The material condition designation H... is the same for both hardness test methods.
S (suffix)	Material condition for a product which is stress relieved. NOTE 2 Products in the M or H... condition may be specially processed (i.e. mechanically or thermally stress relieved) in order to lower the residual stress level to improve the resistance to stress corrosion and the dimensional stability on machining [see 5 l), 5 m) and 8.4].

Except when the suffix S is used, material condition is designated by only one of the above designations.

4.3 Product

The product designation provides a standardized pattern of designation from which a rapid and unequivocal description of a product is conveyed in communication. It provides mutual comprehension at the international level with regard to products which meet the requirements of the relevant European Standard.

The product designation is no substitute for the full content of the standard.

The product designation for products to this standard shall consist of:

- denomination (Hollow rod);
- number of this European Standard (EN 12168);
- material designation, either symbol or number (see Tables 1 to 3);
- material condition designation (see Tables 4 to 6);
- external and/or internal cross-sectional shape (the following designations shall be used as appropriate: RND for round, SQR for square, RCT for rectangular, HEX for hexagonal, OCT for octagonal, PFL for profile);
- nominal cross-sectional dimensions (see note 1 to clause 5) or; for profiles, the number of the profile or a fully dimensioned and toleranced drawing, and:
 - tolerance class A, B or C added to the external dimension (see Table 7); and/or
 - tolerance class A or B added to the wall thickness (the following designation shall be used for wall thickness: WT) (see Table 8); and/or
 - tolerance class A or B added to the bore diameter (see Table 9); and/or
 - tolerance class A or B for eccentricity (the following designations shall be used for eccentricity, as appropriate: ECCA for class A, ECCB for class B);
- for square, hexagonal or octagonal external shape, the corner type (the following designations shall be used as appropriate: SH for sharp, RD for rounded) (see Table 13).

A typical product designation is shown in example 1, and the derivation of a product designation is shown in example 2.