



SLOVENSKI STANDARD
oSIST prEN 12165:2009
01-junij-2009

Baker in bakrove zlitine - Palice (lite in izstiskane) za izkovke

Copper and copper alloys - Wrought and unwrought forging stock

Kupfer und Kupferlegierungen - Vormaterial für Schmiedestücke

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: prEN 12165

<https://standards.iteh.ai/catalog/standards/sist/af066153-4a6e-42a0-a4e1-bb290c7efc96/sist-en-12165-2011>

ICS:

77.150.30 Bakreni izdelki Copper products

oSIST prEN 12165:2009

en,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 12165

April 2009

ICS 77.150.30

Will supersede EN 12165:1998

English Version

Copper and copper alloys - Wrought and unwrought forging stock

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 133.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
Foreword.....	4
1 Scope.....	5
2 Normative references	5
3 Terms and definitions	5
deviation from circular form	6
4 Designations	6
4.1 Material	6
4.2 Material condition	6
4.3 Product	6
5 Ordering information	7
6 Requirements	8
6.1 Composition	8
6.2 Mechanical properties	8
6.3 Resistance to dezincification	8
6.4 Dimensions and tolerances	8
7 Sampling	9
7.1 General.....	9
7.2 Analysis	9
7.3 Hardness and dezincification resistance tests.....	9
8 Test methods.....	9
8.1 Analysis	9
8.2 Hardness test	10
8.3 Dezincification resistance test	10
8.4 Retests for analysis, hardness and dezincification resistance	10
8.5 Rounding of results	10
9 Declaration of conformity and inspection documentation.....	11
9.1 Declaration of conformity	11
9.2 Inspection documentation	11
10 Marking, packaging, labelling.....	11
Annex A (normative) Determination of mean depth of dezincification	22
A.1 Introduction	22
A.2 Procedure	22
A.3 Expression of results	22
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 97/23/EC	24
Bibliography	25
Figures	
Figure A.1 — Example of contiguous fields	23
Tables	
Table 1 — Composition of copper	12
Table 2 — Composition of low alloyed copper alloys.....	13
Table 3 — Composition of copper-aluminium alloys.....	14
Table 4 — Composition of copper-nickel alloys.....	14
Table 5 — Composition of copper-nickel-zinc alloys	15

Table 6 — Composition of copper-zinc alloys.....	15
Table 7 — Composition of copper-zinc-lead alloys	16
Table 8 — Composition of complex copper-zinc alloys	17
Table 9 — Mechanical properties of round forging stock of copper	18
Table 10 — Mechanical properties of round forging stock of low alloyed copper alloys	18
Table 11 — Mechanical properties of round forging stock of copper-aluminium alloys.....	18
Table 12 — Mechanical properties of round forging stock of copper-nickel alloys.....	19
Table 13 — Mechanical properties of round forging stock of copper-nickel-zinc alloys	19
Table 14 — Mechanical properties of round forging stock of copper-zinc alloys.....	19
Table 15 — Mechanical properties of round forging stock of copper-zinc-lead alloys	19
Table 16 — Mechanical properties of round forging stock of complex copper-zinc alloys	20
Table 17 — Tolerances on diameter of round forging stock	20
Table 18 — Tolerances on straightness of round forging stock.....	20
Table 19 — Sampling rate.....	21
Table ZA.1 — Correspondence between this European Standard and Directive 97/23/EC	24

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN 12165:2011

<https://standards.iteh.ai/catalog/standards/sist/af066153-4a6e-42a0-a4e1-bb290c7efc96/sist-en-12165-2011>

prEN 12165:2009 (E)**Foreword**

This document (prEN 12165:2009) has been prepared by Technical Committee CEN/TC 133 "Copper and copper alloys", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12165:1998.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Pressure Equipment Directive (PED) 97/23/EC.

For relationship with EU Directive 97/23/EC, see informative Annex ZA, which is an integral part of this document.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 4 "Extruded and drawn products, forging and scrap" to revise the following standard:

EN 12165, *Copper and copper alloys — Forging stock*

This is one of a series of European Standards for the copper and copper alloy products rod, wire, profile and forgings. 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 12166, *Copper and copper alloys — Wire for general purposes*

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

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

EN 12420, *Copper and copper alloys — Forgings*

In comparison with the first edition of EN 12165:1998, the following significant technical changes were made:

- a) some materials have been removed because they are no longer of economic importance;
- b) the tables 8_ to 16 of mechanical properties were rationalised to reflect current requirements of economic importance.

1 Scope

This European Standard specifies the composition, property requirements and dimensional tolerances for forging stock of copper and copper alloys. The sampling procedures and the methods of test for verification of conformity to the requirements of this European Standard are also specified.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

CEN/TS 13388, *Copper and copper alloys — Compendium of compositions and products*

EN 1173, *Copper and copper alloys — Material condition designation*

EN 1412, *Copper and copper alloys — European numbering system*

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

EN 1976, *Copper and copper alloys — Cast unwrought copper products*

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

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

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

EN ISO 9001, *Quality management systems — Requirements*

ISO 31-0, *Quantities and units — Part 0: General principles*

ISO 1190-1, *Copper and copper alloys — Code of designation — Part 1: Designation of materials*

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

3 Terms and definitions

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

3.1

forging

lumpy product produced by forging processes, hammering or pressing between open or closed dies, including hammering between flat surfaces, normally when hot

NOTE The term “forging” includes the processes of forging, drop forging, hot stamping and hot pressing; the term “forgings” includes the products resulting from any of these processes of manufacture.

3.2

forging stock

extruded, rolled, drawn or cast product such as rod, hollow rod, bar or profile, intended for the production of forgings

prEN 12165:2009 (E)

3.3

deviation from circular form

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

4 Designations

4.1 Material

4.1.1 General

The material is designated either by symbol or number (see Tables 1 to 8).

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.

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 (Forging stock);
- number of this European Standard (EN 12165);
- material designation, either symbol or number (see Tables 1 to 8);
- material condition designation (see Tables 9 to 16);

- cross-sectional shape (the following designations shall be used as appropriate: RND for round, SQR for square, HEX for hexagonal, OCT for octagonal, RCT for rectangular (bar), PFL for profile);
- for rod with round or regular polygonal cross-section, hollow rod or bar, the nominal cross-sectional dimension(s) (diameter, width across-flats, external dimension × internal dimension, width × thickness, as appropriate);
- for profiles, the number of the profile, or a fully dimensioned and toleranced drawing;
- for round rod, the tolerance class (see Table 17).

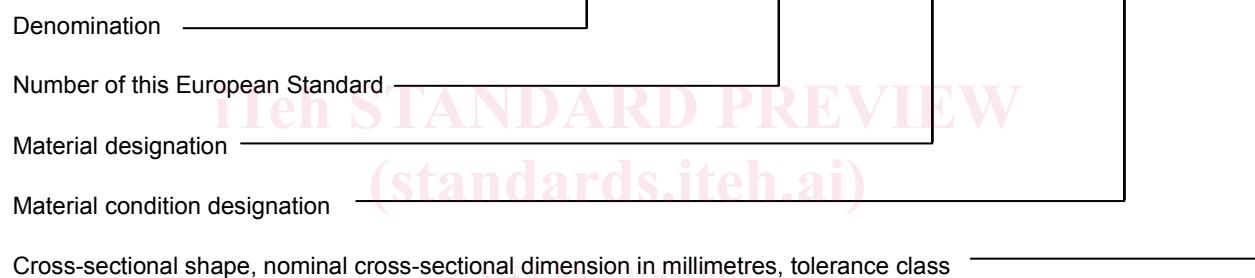
The derivation of a product designation is shown in the following example.

EXAMPLE Forging stock conforming to this standard, in material designated either CuZn40Pb2 or CW617N, in material condition H080, round, nominal diameter 15 mm, tolerance class A, shall be designated as follows:

Forging stock — EN 12165 — CuZn40Pb2 — H080 — RND15A

or

Forging stock — EN 12165 — CW617N — H080 — RND15A



<https://standards.iteh.ai/catalog/standards/sist/af066153-4a6e-42a0-a4e1-bb290c7efc96/sist-en-12165-2011>

5 Ordering information

In order to facilitate the enquiry, order and confirmation of order procedures between the purchaser and the supplier, the purchaser shall state on his enquiry and order the following information:

- a) quantity of product required (mass);
- b) denomination (Forging stock);
- c) number of this European Standard (EN 12165);
- d) material designation (see Tables 1 to 8);
- e) material condition designation (see 4.2 and Tables 9 to 16), if it is other than M;
- f) cross-sectional shape;
- g) size required:
 - for round rod, diameter and whether class A, B tolerance is required, unless the tolerance class is to be left to the discretion of the supplier (see Table 17);
 - for rod with regular polygonal cross-section or hollow rod or bar, nominal dimension(s) and tolerance(s) required unless they are to be left to the discretion of the supplier;
 - for profiles, a fully dimensioned and toleranced drawing;

prEN 12165:2009 (E)

h) the length of product required, if not left to the discretion of the supplier;

NOTE It is recommended that the product designation, as described in 4.3, is used for items b) to g).

In addition, the purchaser shall also state on the enquiry and order any the following, if required:

- i) whether a declaration of conformity is required (see 9.1);
- j) whether an inspection document is required, and if so, which type (see 9.2);
- k) whether there are any special requirements for marking, packaging or labelling (see Clause 10).

EXAMPLE Ordering details for 500 kg of forging stock conforming to EN 12165, in material designated either CuZn40Pb2 or CW617N, in material condition H080, round, nominal diameter 15 mm, tolerance class A, length 2500 mm:

500 kg Forging stock EN 12165 — CuZn40Pb2 — H080 — RND15A

6 Requirements**6.1 Composition**

The composition shall conform to the requirements for the appropriate material given in Tables 1 to 8.

6.2 Mechanical properties

Shapes other than round can be delivered in M material condition in accordance between supplier and customer.

The hardness properties of H... material condition material shall conform to the Brinell hardness requirements given for forging stock with round cross-section in Tables 9 to 16. The test shall be carried out in accordance with 8.3.

NOTE: In case mechanical properties are required for forging stock, rods in accordance with EN 12163 or EN 12164 shall be used.

6.3 Resistance to dezincification

The maximum depth of dezincification of CuZn36Pb2As (CW602N) products shall be 100 µm for sizes up to 40 mm. For greater sizes the average depth of dezincification shall be less than 100 µm and the maximum measured value shall be less than 200 µm.

The test shall be carried out in accordance with 8.4.

NOTE The as-supplied forging stock may not necessarily meet this requirement unless suitably heat treated as described in 8.4. The test is intended to demonstrate that forgings produced from the stock are capable of being processed so as to pass the test requirement.

6.4 Dimensions and tolerances**6.4.1 Diameter**

The diameter shall conform to the tolerances given in Table 17 for class A, B, as appropriate to the order [see 5 g)]. The diameter is calculated as the mean of one or more pairs of measurements taken at right angles at the same cross-section of the rod.

6.4.2 Deviation from circular form

For round rod the deviation from circular form shall not exceed half the range of the tolerance on diameter given in Table 17.

6.4.3 Length

The forging stock shall have length and length tolerances agreed between customer and supplier.

6.4.4 Straightness

For round rod of diameter from 10 mm up to and including 50 mm of length 1 000 mm or over, the deviation from straightness, defined as the curvature (depth of arc) against a datum line when the product is lying flat in a horizontal plane, shall conform to the tolerances given in Table 18.

7 Sampling

7.1 General

When required (e.g. if necessary in accordance with specified procedures of a supplier's quality system, or when the purchaser requests inspection documents with test results, or for use in cases of dispute), an inspection lot shall be sampled in accordance with 7.2 and 7.3.

7.2 Analysis

The sampling rate shall be in accordance with Table 20. A test sample, depending on the analytical technique to be employed, shall be prepared from each sampling unit and used for the determination of the composition.

NOTE 1 When preparing the test sample, care should be taken to avoid contaminating or overheating the test sample. Carbide tipped tools are recommended; steel tools, if used, should be made of magnetic material to assist in the subsequent removal of extraneous iron. If the test samples are in finely divided form (e.g. drillings, millings), they should be treated carefully with a strong magnet to remove any particles of iron introduced during preparation.

NOTE 2 In cases of dispute concerning the results of analysis, the full procedure given in ISO 1811-2 should be followed.

NOTE 3 Results may be used from analyses carried out at an earlier stage of manufacturing the product, e.g. at the casting stage, if the material identity is maintained and if the quality system of the manufacturer is certified as conforming to EN ISO 9001.

7.3 Hardness and dezincification resistance tests

The sampling rate shall be in accordance with Table 20. Sampling units shall be selected from the finished products. The test samples shall be cut from the sampling units and may require heat treatment before testing. Test samples, and test pieces prepared from them, shall not be subjected to any further treatment other than any machining operations necessary in the preparation of the test pieces.

8 Test methods

8.1 Analysis

Analysis shall be carried out on the test pieces, or test portions, prepared from the test samples obtained in accordance with 7.2. Except in cases of dispute, the analytical methods used shall be at the discretion of the supplier. In cases of dispute concerning the results of analysis, methods of analysis to be used shall be agreed between the disputing parties. For expression of results, the rounding rules given in 8.5 shall be used.