SLOVENSKI STANDARD
SIST EN 12165:2024

01-december-2024

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

Copper and copper alloys - Wrought and unwrought forging stock

Kupfer und Kupferlegierungen - Vormaterial für Schmiedestücke

Cuivre et alliages de cuivre - Barres corroyées et brutes pour matriçage

Ta slovenski standard je istoveten z: **EN 12165:2024**

ICS:

77.150.30 Bakreni izdelki Copper products

SIST EN 12165:2024 **en,fr,de**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12165

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ICS 77.150.30

Supersedes EN 12165:2016

English Version

Copper and copper alloys - Wrought and unwrought forging stock

Cuivre et alliages de cuivre - Barres corroyées et brutes pour matriçage

Kupfer und Kupferlegierungen - Vormaterial für Schmiedestücke

This European Standard was approved by CEN on 5 May 2024.

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This European Standard exists 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-CENELEC Management Centre has the same status as the official versions.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 12165:2024) 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text or by endorsement, at the latest by month year of April 2025, and conflicting national standards shall be withdrawn at the latest by April 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12165:2016

In comparison with EN 12165:2016, the following significant technical changes were made:

a) Introduction in 6.4 of eddy current test parameters;

b) Introduction of 6.5 Internal inclusion;

c) Modified the definition of diameter at 6.3.1;

d) Added a new Figure for straightness at 6.4.4 and modified values in Table 11;

e) Introduction in the chemical composition Tables of a footnote to explain the meaning of elements for which no upper and lower limits are specified;

f) CuSi4Zn4MnP (CW245E) and CuSi4Zn9MnP (CW246E) added in the new Table 3;

g) Chemical composition of CuZn39Pb3 (CW614N), CuZn40Pb2 (CW617N), CuZn35Pb1,5AlAs (CW625N) and CuZn33Pb1,5AlAs (CW626N) modified in Table 8;

h) Added a new alloy CuZn40Pb1 (CW627N) in Table 8;

i) Chemical composition of CuZn33Pb1AlSiAs (CW725R) modified in Table 9;

j) Added a new alloy CuZn36Si1P (CW726R) in Table 9;

k) Removed Tables of Mechanical properties (old Table 9, Table 10, Table 11, Table 12, Table 13, Table 14, Table 15 and Table 16);

l) Renamed Table 17 in Table 10, Table 18 in Table 11, Table 19 in Table 12;

m) Added new Table 13.

This document 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 bars for general purposes*;

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

— EN 12420, *Copper and copper alloys — Forgings*;

— EN 13601, *Copper and copper alloys — Copper rod, bar and wire for general electrical purposes*;

— EN 13602, *Copper and copper alloys — Drawn round copper wire for the manufacture of electrical conductors*;

— EN 13605, *Copper and copper alloys — Copper profiles and profiled wires for electrical purposes*.

Any feedback and questions on this document should be directed to the users' national standards body.

A complete listing of these bodies can be found on the CEN website. According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

The European Committee for Standardization (CEN) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning the alloys CuSi4Zn4MnP (CW245E), CuSi4Zn9MnP (CW246E) and CuZn36Si1P (CW726R) given in 6.1.

CEN takes no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has ensured the CEN that he is willing to negotiate licenses either free of charge or under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with CEN.

— For CuSi4Zn4MnP (CW245E) and CuSi4Zn9MnP (CW246E) information may be obtained from:

Viega Technology GmbH & Co. KG
Viega Platz 1
57439 Attendorn
GERMANY

— For CuZn36Si1P (CW726R) information may be obtained from:

Luvata Oy
Kuparitie 5
28330 Pori
FINLAND

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. CEN shall not be held responsible for identifying any or all such patent rights.

CEN and CENELEC maintain online lists of patents relevant to their standards. Users are encouraged to consult the lists for the most up to date information concerning patents (ftp://ftp.cencenelec.eu/EN/IPR/Patents/IPRdeclaration.pdf).

Due to developing legislation, the composition of a material may be restricted to the composition specified in this European Standard with respect to individual uses (e.g. for the use in contact with drinking water in some Member States of the European Union). These individual restrictions are not part of this European Standard. Nevertheless, for materials for which traditional and major uses are affected, these restrictions are indicated. The absence of an indication, however, does not imply that the material can be used in any application without any legal restriction.

1 Scope

This document 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 document are also specified.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

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

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

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

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

EN 17263, *Copper and copper alloys - Eddy current testing on the outer surface of rods, bars, hollow rods and wires for the detection of defects by encircling test coil*

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

EN ISO 6509-1, *Corrosion of metals and alloys - Determination of dezincification resistance of copper alloys with zinc - Part 1: Test method (ISO 6509-1)*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
forging
three-dimensional shaped product produced by a plastic forming process such as hammering or pressing between open or closed dies, including hammering between flat surfaces, normally when hot

Note 1 to entry Forging processes include, drop forging, hot stamping and hot pressing.

3.2
forging stock
extruded, rolled or drawn product such as rod, hollow rod, bar or profile or cast product, intended for the production of forgings

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 by number (see Tables 1 to 9).

4.1.2 Symbol

The material symbol designation shall be 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 shall be 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;

4.3 Product

The product designation provides a standardized pattern of designation from which a rapid and unequivocal description of a product can be 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 9);

— DW for compliance in the chemical composition according to the 4 MS Common Composition List. This information is mandatory in the case in which the product is used for drinking water applications according to the 4 MS Common Composition List and not to be given in other cases (see Bibliography [6]);

— 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 10).

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

EXAMPLE 1 Forging stock conforming to this standard, in material designated either CuZn40Pb2 or CW617N, for standard applications, in material condition M, round, nominal diameter 15 mm, tolerance class A, will be designated as follows:

Forging stock — EN 12165 — CuZn40Pb2— M — RND15A

or

Forging stock — EN 12165 — CW617N — M — RND15A

Denomination

Number of this European Standard

Material designation

Material condition designation

Cross-sectional shape, nominal cross-sectional dimension in millimetres, tolerance class

EXAMPLE 2 Forging stock conforming to this standard, in material designated either CuZn40Pb2 or CW617N, for drinking water applications according to the 4 MS Common Composition List, in material condition M, round, nominal diameter 15 mm, tolerance class A, will be designated as follows: