BS EN 12165:2024

BSI Standards Publication

Copper and copper alloys — Wrought and unwrought forging stock

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National foreword

This British Standard is the UK implementation of EN 12165:2024. It supersedes BS EN 12165:2016, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee NFE/34, Copper and copper alloys.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2024

ISBN 978 0 539 20210 6

ICS 77.150.30

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2024.

Amendments/corrigenda issued since publication

Date	Text affected

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12165

October 2024

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

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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text or by endorsement, at the latest by month year of April 2025, and conflicting national standards shall be withdrawn at the latest by April 2025.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*;

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— 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.

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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

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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.

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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*

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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;

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