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BSI Standards Publication

Copper and copper alloys — Wire for general purposes

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National foreword

This British Standard is the UK implementation of EN 12166:2024. It supersedes BS EN 12166:2016, which is withdrawn.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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UK Government is responsible for legislation. For information on legislation and policies relating to that legislation, consult the relevant pages of www.gov.uk.

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Compliance with a British Standard cannot confer immunity from legal obligations.

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Amendments/corrigenda issued since publication

Date

Text affected

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EUROPÄISCHE NORM

October 2024

ICS 77.150.30

Supersedes EN 12166:2016

English Version

Copper and copper alloys - Wire for general purposes

Cuivre et alliages de cuivre - Fils pour usages généraux

Kupfer und Kupferlegierungen - Drähte zur
allgemeinen Verwendung

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

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of 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 United Kingdom.



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 12166:2024) 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 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 12166:2016.

In comparison with EN 12166:2016, the following significant technical changes were made:

- a) Modification of the definition of diameter or width across-flats in 6.4.1;
- b) Modification of 6.4.2 with the introduction of 6.4.2.1 Round wire and 6.4.2.2 Wire with square or regular cross-section;
- c) Introduction of eddy current test parameters in 6.6;
- d) Introduction of 6.7 Internal inclusion;
- e) Addition of CuPb1P (CW113C) in Table 1 and Table 7;
- f) Addition of CuSn5 (CW451K) in Table 3 and Table 9;
- g) Addition of a new alloy CuZn36Si1P (CW726R) in Table 6 and Table 12;
- h) Introduction in the chemical composition Tables of a footnote to explain the meaning of elements for which no upper and lower limits are specified;
- i) Modification of the chemical composition of CuZn39Pb3 (CW614N) and CuZn40Pb2 (CW617N) in Table 5;
- j) Addition of a new alloy CuZn40Pb1 (CW627N) in Table 5 and Table 11;
- k) Addition of Table 19;
- l) Addition of Annex ZA.

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 12165, *Copper and copper alloys — Wrought and unwrought forging stock*;
- EN 12167, *Copper and copper alloys — Profiles and bars for general purposes*;

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

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

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.

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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 alloy 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.

Information may be obtained from:

— 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 (<https://www.cencenelec.eu/european-standardization/ipr-and-patents/patents/>).

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 copper alloy wire, finally produced by drawing, rolling or extruding, intended for general purposes, spring and fastener manufacturing applications.

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 764-5:2014, *Pressure equipment — Part 5: Inspection documentation of metallic materials and compliance with the material specification*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN 17263:2019, *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 2624:1995, *Copper and copper alloys — Estimation of average grain size (ISO 2624:1990)*

EN ISO 6507-1:2018, *Metallic materials — Vickers hardness test — Part 1: Test method (ISO 6507-1:2018)*

EN ISO 6892-1:2019, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2019)*

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 <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

wire

wound product of uniform cross-section along its whole length

Note 1 to entry: Rectangles may have round or sharp corners.

3.2

deviation from circular form

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