



SLOVENSKI STANDARD
SIST EN 12166:1999

01-november-1999

Baker in bakrove zlitine - Žica za splošno uporabo

Copper and copper alloys - Wire for general purposes

Kupfer und Kupferlegierungen - Drähte zur allgemeinen Verwendung

Cuivre et alliages de cuivre - Fils pour usages généraux

Ta slovenski standard je istoveten z: EN 12166:1998

[SIST EN 12166:1999](#)

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ICS:

77.150.30 Bakreni izdelki Copper products

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EUROPEAN STANDARD

EN 12166

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 1998

ICS 77.150.30

Descriptors: copper, copper alloys, wrought products, wire, designation, orders : sales documents, chemical composition, mechanical properties, sampling, mechanical tests, dimensions, dimensional tolerances, corrosion resistance, conformity tests, marking

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 26 December 1997.

CEN members are bound to comply with the CEN/GENELEC 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword	4
1 Scope	5
2 Normative references	5
3 Definitions	6
3.1 wire	6
3.2 circularity (wire)	6
4 Designations	6
4.1 Material	6
4.2 Material condition	6
4.3 Product	7
5 Ordering information	9
6 Requirements	11
6.1 Composition	11
6.2 Mechanical properties	11
6.3 Grain size	12
6.4 Dimensions and tolerances	12
6.5 Joins	13
7 Sampling	13
7.1 General	13
7.2 Analysis	13
7.3 Tensile, hardness and grain size tests	14
8 Test methods	14
8.1 Analysis	14
8.2 Tensile test	14
8.3 Hardness test	15
8.4 Estimation of average grain size	15
8.5 Retests	16
8.6 Rounding of results	16
9 Declaration of conformity and inspection documentation	16
9.1 Declaration of conformity	16
9.2 Inspection documentation	16
10 Marking, labelling, packaging	16

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SIST EN 12166:1999

<https://standards.iteh.ai/catalog/standards/sist/f8ca4432-8c4c-4ff-f81e2-e070b7ca9034/sist-en-12166-1999>



ALIMBVOLO ANTIKORZIJSKI
ČELIČNI KAVČIČI ZA ČELIČNE
SPOJNE TOČKE V OBLASTI
ANALIZIRANJA



Table 1:	Composition of copper	17
Table 2:	Composition of low alloyed copper alloys	18
Table 3:	Composition of copper-nickel-zinc alloys	19
Table 4:	Composition of copper-tin alloys	20
Table 5:	Composition of copper-zinc alloys	20
Table 6:	Composition of copper-zinc-lead alloys	20
Table 7:	Composition of complex copper-zinc alloys	21
Table 8:	Mechanical properties of copper	21
Table 9:	Mechanical properties of low alloyed copper alloys	22
Table 10:	Mechanical properties of copper-nickel-zinc alloys	26
Table 11:	Mechanical properties of copper-tin alloys	29
Table 12:	Mechanical properties of copper-zinc alloys	32
Table 13:	Mechanical properties of copper-zinc-lead alloys	35
Table 14:	Mechanical properties of complex copper-zinc alloys	37
Table 15:	Grain size designations	38
Table 16:	Tolerances on diameter of round wire	38
Table 17:	Tolerances on width across-flats of square or regular polygonal wire	38
Table 18:	Tolerances on width and thickness of rectangular wire	39
Table 19:	Corner radii for square or rectangular wire	39
Table 20:	Sampling rate	39

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Annex A (informative) Bibliography	40
Annex B (informative) Position of wire cross-section within a coil, reel, spool or drum	41

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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 12166 Copper and copper alloys - Wire for general 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, or will be, 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 rectangular bar for general purposes

....*) Copper and copper alloys - Rod and wire for welding and braze welding
(W1: 00133021)

....*) Copper and copper alloys - Drawn round copper wire for the manufacture of electrical conductors (W1: 00133025)

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.

*) In course of preparation

1 Scope

This European Standard specifies the composition, property requirements and dimensional tolerances for copper and copper alloy wire intended for general purposes, spring and fastener manufacturing applications.

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 10002-1	Metallic materials - Tensile testing - Part 1: Method of test (at ambient temperature)
EN 10204	Metallic products - Types of inspection documents
EN ISO 2624	Copper and copper alloys - Estimation of average grain size (ISO 2624:1990)
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 6507-2	Metallic materials - Hardness test - Vickers test - Part 2: HV 0, 2 to less than HV 5

NOTE. Informative references to documents used in the preparation of this standard, and cited at the 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 wire

Solid wrought product of uniform cross-section along its whole length supplied in coil form or on spools, reels or in drums. The cross-sections are in the shape of circles, squares, regular polygons, rectangles with rolled or drawn edges or small profiles.

3.2 circularity (wire)

Difference between the maximum and the minimum diameters measured at any one cross-section of the wire.

4 Designations

4.1 Material

4.1.1 General

The material is designated either by symbol or number (see tables 1 to 7).

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4.1.2 Symbol

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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;

R... Material condition designated by the minimum value of tensile strength requirement for the product with mandatory tensile property requirements;

H... Material condition designated by the minimum value of hardness requirement for the product with mandatory hardness requirements;

NOTE 1: The H... condition is not applicable to any round wires less than 1,5 mm diameter, or to round wires of any size in alloys given in tables 4 and 5 and the non-lead alloys given in table 3.

G... Material condition designated by the mid-range value of grain size requirement for the product with mandatory grain size requirement.

NOTE 2: The G... condition is normally applicable only to round wires in the soft condition made from alloys given in tables 1, 4 and 5, non-lead alloys given in table 3 and alloys CuSi1 (CW115C) and CuSi3Mn1 (CW116C) given in table 2.

NOTE 3: If G... condition material is required, the grain size requirement should be selected from table 15 and agreed between the purchaser and the supplier and stated in the enquiry and/or order [see 5 b)].

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Exact conversion between material conditions designated R..., H... and G... is not possible.

Material condition is designated by only one of the above designations.

4.3 Product

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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 (Wire);
- number of this European Standard (EN 12166);
- material designation, either symbol or number (see tables 1 to 7);

- material condition designation (see 4.2 and tables 8 to 15);
- 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 dimension(s) (or the number of the profile or a fully dimensioned and toleranced drawing);
- tolerance class for round, square or polygonal wire, (see tables 16 and 17);
- corner type for square or rectangular wire, (the following designations shall be used as appropriate: SH for sharp, RD for rounded), (see table 19).

The derivation of a product designation is shown in example 1 and another typical product designation is shown in example 2.

EXAMPLE 1:

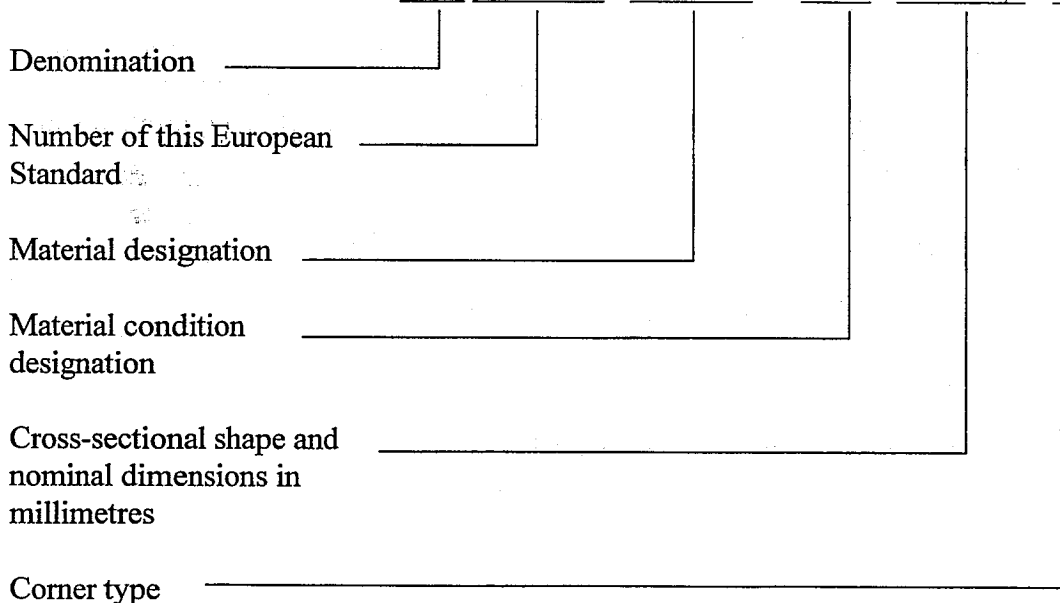
Wire conforming to this standard, in material designated either CuZn39Pb3 or CW614N, in material condition H120, rectangular, nominal cross-sectional dimensions 6,0 mm x 5,0 mm, with sharp corners, shall be designated as follows:

Wire EN 12166 - CuZn39Pb3 - H120 - RCT6,0 x 5,0 - SH

or [SIST EN 12166:1999](https://standards.iteh.ai/catalog/standards/sist/f8ca4432-8c4c-4ff8-81e2-1999-12166/sist-en-12166-1999)

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Wire EN 12166 - CW614N - H120 - RCT6 5,0 - SH



EXAMPLE 2:

Wire conforming to this standard, in material designated either CuZn39Pb3 or CW614N, in material condition R420, round, nominal diameter 6,0 mm, tolerance class B, shall be designated as follows:

Wire EN 12166 - CuZn39Pb3 - R420 - RND6,0B

or

Wire EN 12166 - CW614N - R420 - RND6,0B

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:

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- a) quantity of product required (mass);
- b) denomination (Wire);
- c) number of this European Standard (EN 12166);
- d) material designation (see tables 1 to 7);
- e) material condition designation (see 4.2 and tables 8 to 15) if it is other than M. The purchaser may request, and it shall then be subject to agreement between the supplier and the purchaser, that the informative values of 0,2 % proof strength become mandatory, in which case the specified tensile strength values become informative;
- NOTE 1: If G... condition material is required, the grain size requirement should be selected from table 15 and agreed between the purchaser and the supplier.
- f) cross-sectional shape;
- g) nominal cross-sectional dimension(s) (diameter or width across-flats);
- h) for round, square and regular polygonal wire, the tolerance class required, unless the tolerance class is to be left to the discretion of the supplier, (see tables 16 and 17). For profiles, the tolerances required (or a drawing with dimensions and tolerances);

- i) for square or rectangular wire, whether 'sharp' or 'rounded' corners are required, unless the corner radii are to be left to the discretion of the supplier (see table 19).

NOTE 2: It is recommended that the product designation, as described in 4.3, is used for items b) to l).

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

- j) for profiles, if the shape is such that the position of the cross-section within the coil, reel, spool or drum is of importance to the purchaser, this should be stated on the drawing (see annex B for illustration);
- k) for profiles, whether mechanical properties are required. If so, the method of test and the level of properties shall be agreed between the purchaser and the supplier;
- l) whether a declaration of conformity is required (see 9.1);
- m) whether an inspection document is required, and if so, which type (see 9.2);
- n) whether there are any special requirements for marking, labelling or packaging including, if necessary, any limitation on dimensions or mass of coils, spools, reels or drums (see clause 10).

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EXAMPLE 1:

Ordering details for 1 000 kg wire for general purposes conforming to EN 12166, in material designated either CuZn39Pb3 or CW614N, in material condition H120, rectangular, nominal cross-sectional dimensions 6,0 mm x 5,0 mm, with sharp corners, in 25 kg coils:

1 000 kg Wire EN 12166 - CuZn39Pb3 - H120 - RCT 6,0 x 5,0 - SH

- 25 kg coils

or

1 000 kg Wire EN 12166 - CW614N - H120 - RCT 6,0 x 5,0 - SH

- 25 kg coils

EXAMPLE 2:

Ordering details for 5 000 kg wire for general purposes conforming to EN 12166, in material designated either CuZn39Pb3 or CW614N, in material condition R420, round, nominal diameter 6,0 mm, tolerance class B, on 1 000 kg spools:

5 000 kg Wire EN 12166 - CuZn39Pb3 - R420 - RND6,0B

- 1 000 kg spools

or

5 000 kg Wire EN 12166 - CW614N - R420 - RND6,0B

- 1 000 kg spools

6 Requirements**6.1 Composition**

The composition shall conform to the requirements for the appropriate material given in tables 1 to 7.

6.2 Mechanical properties

The tensile properties of R... condition material or the hardness properties of H... condition material shall conform to the appropriate requirements given in tables 8 to 14. The tests shall be carried out in accordance with 8.2 or 8.3.

NOTE 1: The H... condition is not applicable to any round wires less than 1,5 mm diameter, or to round wires of any size in alloys given in tables 4 and 5, and the non-leaded alloys given in table 3.

NOTE 2: Elongation values are not applicable to wire sizes less than 0,5 mm (or equivalent cross-sectional areas for polygonal wires).