

Vask ja vasesulamid. Profiilid ja ristkülikukujulise ristlõikega üldotstarbelised latid

Copper and copper alloys - Profiles and rectangular bar for general purposes

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 12167:2011 sisaldab Euroopa standardi EN 12167:2011 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 30.06.2011 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 01.06.2011.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 12167:2011 consists of the English text of the European standard EN 12167:2011.

This standard is ratified with the order of Estonian Centre for Standardisation dated 30.06.2011 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 01.06.2011.

The standard is available from Estonian standardisation organisation.

ICS 77.150.30

Võtmesõnad: deformeeritavad tooted, keemiline koostis, mehaanilised omadused, mehaanilised teimid, metall-latid, mõõtmised, müügidokumendid, profiilmetall, proovivõtmine, tasapinnalised latid (sordivalstooted), tellimused, tähistus, vasesulamid, vask

Inglisekeelsed võtmesõnad: chemical composition, conformity tests, copper, copper alloys, corrosion resistance, designation, dimensional tolerances, dimensions, flat bars, mechanical properties, mechanical tests, metal bars, metal sections, orders, sales documents, sampling, wrought products

Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Eesti; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

Right to reproduce and distribute belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:
Aru str 10 Tallinn 10317 Estonia; www.evs.ee; Phone: 605 5050; E-mail: info@evs.ee

English Version

Copper and copper alloys - Profiles and bars for general purposes

Cuivre et alliages de cuivre - Profilés et barres pour usages généraux

Kupfer und Kupferlegierungen - Profile und Rechteckstangen zur allgemeinen Verwendung

This European Standard was approved by CEN on 14 April 2011.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	4
Introduction	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	7
4 Designations	8
4.1 Material	8
4.1.1 General.....	8
4.1.2 Symbol	8
4.1.3 Number	8
4.2 Material condition	8
4.3 Product	8
5 Ordering information	10
6 Requirements	11
6.1 Composition	11
6.2 Mechanical properties	11
6.2.1 Profiles	11
6.2.2 Bar	11
6.3 Resistance to dezincification	11
6.4 Residual stress level	12
6.5 Dimensions and tolerances	12
6.5.1 Cross-sectional dimensions	12
6.5.2 Length	12
6.5.3 Flatness	12
6.5.4 Straightness	13
6.5.5 Twist.....	13
6.5.6 Corner radii of bar.....	14
7 Sampling	14
7.1 General.....	14
7.2 Analysis	14
7.3 Tensile and hardness tests.....	15
7.4 Dezincification resistance and stress corrosion resistance tests	15
8 Test methods.....	15
8.1 Analysis	15
8.2 Tensile test	15
8.2.1 General.....	15
8.2.2 Location of test pieces	15
8.2.3 Shape and size of test pieces.....	16
8.2.4 Procedure for testing	16
8.2.5 Expression of results	16
8.3 Hardness test	16
8.4 Dezincification resistance test	16
8.5 Stress corrosion resistance test.....	16
8.6 Retests	17
8.6.1 Analysis, tensile, hardness and dezincification resistance tests.....	17
8.6.2 Stress corrosion resistance test	17
8.7 Rounding of results	17

9	Declaration of conformity and inspection documentation	17
9.1	Declaration of conformity	17
9.2	Inspection documentation	17
10	Marking, packaging, labelling	18
Annex A	(normative) Determination of mean depth of dezincification	40
A.1	Introduction	40
A.2	Procedure	40
A.3	Expression of results	40
Bibliography		42

Tables

Table 1	— Composition of low alloyed copper alloys	19
Table 2	— Composition of copper-aluminium alloys	20
Table 3	— Composition of copper-nickel-zinc alloys	20
Table 4	— Composition of copper-tin alloys	21
Table 5	— Composition of copper-zinc alloys	21
Table 6	— Composition of copper-zinc-lead alloys	22
Table 7	— Composition of complex copper-zinc alloys	24
Table 8	— Mechanical properties of low alloyed copper alloys	25
Table 9	— Mechanical properties of copper-aluminium alloys	27
Table 10	— Mechanical properties of copper-nickel-zinc alloys	28
Table 11	— Mechanical properties of copper-tin alloys	29
Table 12	— Mechanical properties of copper-zinc alloys	30
Table 13	— Mechanical properties of copper-zinc-lead alloys	31
Table 14	— Mechanical properties of complex copper-zinc alloys	33
Table 15	— Tolerances on width (b) and height of a leg (h) for profiles with L-, T- and U-cross-sections	35
Table 16	— Tolerances on thickness for profiles with L-, T- and U-cross-sections	36
Table 17	— Tolerances on width and thickness of bar	37
Table 18	— Tolerances on length of bar	37
Table 19	— Tolerances on straightness of bar, for widths 10 mm and over	38
Table 20	— Maximum twist of bar	38
Table 21	— Corner radii of bar	38
Table 22	— Sampling rate	39

Figures

Figure 1	— Measurement of flatness of bar	13
Figure 2	— Measurement of twist of bar	14
Figure A.1	— Example of contiguous fields	41

Foreword

This document (EN 12167:2011) 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 December 2011, and conflicting national standards shall be withdrawn at the latest by December 2011.

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

This document supersedes EN 12167:1998.

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

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

This is one of a series of European Standards for the copper and copper alloy products rod, wire and profile. 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 12166, *Copper and copper alloys — Wire for general purposes;*
- EN 12168, *Copper and copper alloys — Hollow rod for free machining purposes;*
- EN 13347, *Copper and copper alloys — Rod and wire for welding and braze welding;*
- 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.*

In comparison with EN 12167:1998, the following significant technical changes were made:

- a) Profiles in L-, T-, U-shaped cross-sections incorporated;
- b) Removal of eighteen materials:
 - 1) Cu-DLP (CW023A) and Cu-DHP (CW024A);
 - 2) CuCr1 (CW105C);
 - 3) CuAl6Si2Fe (CW301G), CuAl7Si2 (CW302G) and CuAl10Fe3Mn2 (CW306G);

- 4) CuNi10Zn42Pb2 (CW402J), CuNi12Zn30Pb1 (CW406J) and CuNi12Zn38Mn5Pb2 (CW407J);
 - 5) CuZn38Pb4 (CW609N), CuZn43Pb2 (CW623N), CuZn40Pb2Al (CW618N), CuZn40Pb2Sn (CW619N), CuZn42PbAl (CW621N) and CuZn43Pb1Al (CW622N);
 - 6) CuZn37Pb1Sn1 (CW714R), CuZn39Mn1AlPbSi (CW718R) and CuZn40Mn2Fe1 (CW723R);
- c) Addition of three new materials:
- 1) CuZn42 (CW510L) and CuZn38As (CW511L) due to market requirements on restriction of lead;
 - 2) CuZn21Si3P (CW724R) due to market requirements on restriction of lead;
- d) Revision of the mechanical properties (Tables 8 to 14) to reflect market needs. In particular the 0,2 % proof strength and the elongation that were previously informative are now mandatory, since these are important figures for design purposes;
- e) Introduction of tolerances for width and thickness for profiles with L-, T- and U-cross-sections (Tables 15 and 16);
- f) Modification of the sampling rate (Table 22).

According to the CEN/CENELEC Internal Regulations, the national standards organizations 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland 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 alloy CuZn21Si3P (CW724R) 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 assured the CEN that he is willing to negotiate licenses 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:

Wieland Werke AG
Graf Arco Straße 36
D-89079 Ulm

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.

1 Scope

This European Standard specifies the composition, property requirements and dimensional tolerances for copper alloy profiles including L-, T-, U-shaped cross-sections, and bars, finally produced by drawing or extruding.

This European Standard applies to profiles with L-, T- and U-shaped cross-sections which would fit within a circumscribing circle of a maximum 180 mm diameter and to bars with thicknesses from 3 mm up to and including 60 mm and with widths from 6 mm up to and including 120 mm.

The sampling procedures, 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.

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

EN 14977, *Copper and copper alloys — Detection of tensile stress — 5 % ammonia test*

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1:2005)*

EN ISO 6509:1995, *Corrosion of metals and alloys — Determination of dezincification resistance of brass (ISO 6509:1981)*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1:2009)*

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

ISO 4739, *Wrought copper and copper alloy products — Selection and preparation of specimens and test pieces for mechanical testing*

ISO 6957, *Copper alloys — Ammonia test for stress corrosion resistance*

3 Terms and definitions

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

3.1 profile

straight product of uniform cross-section along its whole length, in the shape other than rod, hollow rod, bar, tube, sheet or strip