



SLOVENSKI STANDARD

SIST EN 13348:2016

01-september-2016

Nadomešča:
SIST EN 13348:2008

Baker in bakrove zlitine - Nevarjene okrogle bakrene cevi za medicinske pline ali vakuumske sisteme

Copper and copper alloys - Seamless, round copper tubes for medical gases or vacuum

Kupfer und Kupferlegierungen - Nahtlose Rundrohre aus Kupfer für medizinische Gase oder Vakuum

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Cuivre et alliages de cuivre - Tubes ronds sans soudure en cuivre pour gaz médicaux ou le vide

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Ta slovenski standard je istoveten z: EN 13348:2016

ICS:

23.040.15	Cevi iz neželeznih kovin	Non-ferrous metal pipes
77.150.30	Bakreni izdelki	Copper products

SIST EN 13348:2016

en,fr,de

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EUROPEAN STANDARD

EN 13348

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2016

ICS 23.040.15

Supersedes EN 13348:2008

English Version

Copper and copper alloys - Seamless, round copper tubes for medical gases or vacuum

Cuivre et alliages de cuivre - Tubes ronds sans soudure
en cuivre pour gaz médicaux ou le vide

Kupfer und Kupferlegierungen - Nahtlose Rundrohre
aus Kupfer für medizinische Gase oder Vakuum

This European Standard was approved by CEN on 28 February 2016.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	3
Introduction	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Designations.....	8
5 Ordering information	9
6 Requirements	9
7 Sampling.....	14
8 Test methods	15
9 Inspection documentation.....	16
10 Packaging, marking and form of delivery	16
Annex A (normative) Marking durability test	18
A.1 Abrasion test.....	18
A.2 Climatic test.....	18
Annex B (normative) Freedom from defects test	19
B.1 Eddy current test.....	19
B.2 Hydrostatic test.....	19
B.3 Pneumatic test.....	20
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of Directive 2014/68/EU aimed to be covered	21
Bibliography.....	22
Tables	
Table 1 — Mechanical properties.....	10
Table 2 — Nominal outside diameters and wall thicknesses	11
Table 3 — Tolerances on outside diameter	12
Table 4 — Tolerance on wall thickness.....	12
Table 5 — Lubricant residue on the inner surface of the tube	13
Table 6 — Testing of bending and drift expanding.....	14
Table 7 — Sampling rate.....	14
Table 8 — Minimum radius of curvature.....	15
Table 9 — Recommended form of delivery.....	17
Table B.1 — Maximum drill diameters for the reference standard tube.....	19
Table B.2 — Hydrostatic pressure test	19
Table ZA.1 — Correspondence between this European Standard and Annex I of Directive 2014/68/EU.....	21

European foreword

This document (EN 13348:2016) 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 2016 and conflicting national standards shall be withdrawn at the latest by December 2016.

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 13348:2008.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of Directive 2014/68/EU, Pressure Equipment Directive (PED).

For relationship with Directive 2014/68/EU, see informative Annex ZA, which is an integral part of this document.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 3 "Copper tubes (installation and industrial)" to revise EN 13348:2008.

In comparison with EN 13348:2008, the following significant technical changes were made:

- a) The size range of the outside diameters has been increased from 133 mm to 219 mm;
- b) Nominal outside diameters have been added to Table 1;
- c) Lubricant residue values for the new outside diameters have been added in 6.5;
- d) Sub-clause 8.7 has been revised and a new normative Annex B "Freedom from defects tests" has been added.

This is one of a series of European Standards for copper and copper alloy tubes. Other products are specified as follows:

- EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*
- EN 12449, *Copper and copper alloys — Seamless, round tubes for general purposes*
- EN 12450, *Copper and copper alloys — Seamless, round copper capillary tubes*
- EN 12451, *Copper and copper alloys — Seamless, round tubes for heat exchangers*
- EN 12452, *Copper and copper alloys — Rolled, finned, seamless tubes for heat exchangers*
- EN 12735-1, *Copper and copper alloys — Seamless, round tubes for air conditioning and refrigeration — Part 1: Tubes for piping systems*

EN 13348:2016 (E)

- EN 12735-2, *Copper and copper alloys — Seamless, round tubes for air conditioning and refrigeration — Part 2: Tubes for equipment*
- EN 13349, *Copper and copper alloys — Pre-insulated copper tubes with solid covering*
- EN 13600, *Copper and copper alloys — Seamless copper tubes for electrical purposes*

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

It is recommended that tubes manufactured to this European Standard are certified as conforming to the requirements of this standard based on continuing surveillance which should be coupled with an assessment of a supplier's quality management system such as EN ISO 9001.

Tubes to this European Standard are suitable for capillary soldering, brazing or assembling by mechanical compression or collared fittings.

NOTE It is advised to take appropriate precautions if applying insulating material because it could be detrimental to the copper tube.

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EN 13348:2016 (E)

1 Scope

This European Standard specifies the requirements, sampling, test methods and conditions of delivery for copper tubes.

It is applicable to seamless round copper tubes having an outside diameter from 6 mm up to and including 219 mm for pipeline systems under vacuum or for distributing the following medical gases intended to be used at operating pressures up to 2 000 kPa:

- oxygen, nitrous oxide, nitrogen, helium, carbon dioxide, xenon;
- medical air;
- specific mixtures of these above mentioned gases;
- air for driving surgical tools;
- anaesthetic gases and vapours.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 723, *Copper and copper alloys - Combustion method for determination of the carbon content on the inner surface of copper tubes or fittings*

[SIST EN 13348:2016](https://standards.iteh.ai/catalog/standards/sist/e2b3acb6-c50c-41c8-a084-18440a9b51d9/sist-en-13348-2016)

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

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EN 1971-1, *Copper and copper alloys - Eddy current test for measuring defects on seamless round copper and copper alloy tubes - Part 1: Test with an encircling test coil on the outer surface*

EN 1971-2, *Copper and copper alloys - Eddy current test for measuring defects on seamless round copper and copper alloy tubes - Part 2: Test with an internal probe on the inner surface*

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

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

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

EN ISO 8491, *Metallic materials - Tube (in full section) - Bend test (ISO 8491)*

EN ISO 8493, *Metallic materials - Tube - Drift-expanding test (ISO 8493)*

ISO 1553, *Unalloyed copper containing not less than 99,90 % of copper - Determination of copper content - Electrolytic method*

ISO 4741, *Copper and copper alloys - Determination of phosphorus content - Molybdovanadate spectrometric method*

3 Terms and definitions

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

3.1

seamless round copper tube

hollow semi-finished product, circular in cross-section, made of copper, having a uniform wall thickness, which at all stages of production has a continuous periphery

[SOURCE: EN 1057:2006+A1:2010, 3.1]

3.2

brazing

joining process using filler metal with a liquidus temperature above 450 °C

[SOURCE: ISO 857-2:2005, 3.1.2]

3.3

mean diameter

arithmetical mean of the maximum and minimum outside diameters through the same cross-section of the tube

[SOURCE: EN 1057:2006+A1:2010, 3.5]

3.4

deviation from circular form

difference between the maximum and minimum outside diameters measured at any one cross-section of the tube

[SOURCE: EN 1057:2006+A1:2010, 3.6]

3.5

deviation from concentricity

half of the difference between the maximum and minimum wall thicknesses at the same cross-section of the tube

[SOURCE: EN 1057:2006+A1:2010, 3.7]

3.6

production batch

definite quantity of products of the same form, the same material condition and the same cross-sectional dimensions manufactured during the same production sequence under uniform conditions

[SOURCE: EN 1057:2006+A1:2010, 3.8]

3.7

permanently marked

marked in such a way that the marking will remain readable up to the end of the life of the installation, e.g. by stamping, etching or engraving

[SOURCE: EN 1057:2006+A1:2010, 3.9]

3.8

durably marked

marked in such a way that the marking will remain readable up to the time of commissioning of the installation

EXAMPLE Ink marking.

[SOURCE: EN 1057:2006+A1:2010, 3.10]

EN 13348:2016 (E)

4 Designations

4.1 Material

4.1.1 General

The material is designated either by symbol or number (see 6.1).

4.1.2 Symbol

The material symbol designation is based on the designation system given in ISO 1190-1.

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 European Standard, the following designation, which is in accordance with the system given in EN 1173, applies for the material condition (see Table 1):

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

4.3 Product

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.

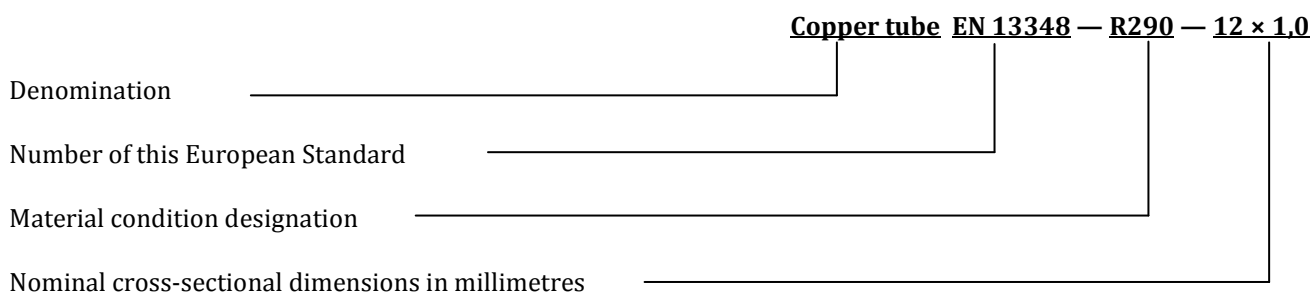
The product designation is no substitute for the full content of the standard.

The product designation for products to this European Standard shall consist of:

- denomination (Copper tube);
- number of this European Standard (EN 13348);
- material condition designation (see Table 1);
- nominal cross-sectional dimensions in millimetres: Outside diameter × wall thickness.

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

EXAMPLE Copper tube conforming to this European Standard, in material condition R290 (hard), nominal outside diameter 12 mm, nominal wall thickness 1,0 mm, will be designated as follows:



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:

- a) quantity of product required (in metres);
- b) denomination (Copper tube);
- c) number of this European Standard (EN 13348);
- d) material condition designation (see 4.2 and Table 1);
- e) nominal cross-sectional dimensions in millimetres: outside diameter × wall thickness (see Table 3);
- f) nominal length (see 10.2);
- g) form of delivery (see 10.2).

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

- h) whether an inspection document is required, and if so, which type (see Clause 9).

NOTE It is advised that the product designation, as described in 4.3, is used for items b) to e).

EXAMPLE Ordering details for 500 m copper tube conforming to EN 13348, in material condition R290 (hard), nominal outside diameter 12 mm, nominal wall thickness 1,0 mm, nominal length 5 m, straight lengths:

500 m Copper tube EN 13348 — R290 — 12 × 1,0 — 5 m straight lengths

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6 Requirements

6.1 Composition

The composition shall conform to the following requirements:

Cu + Ag: min. 99,90 %;

$0,015 \% \leq P \leq 0,040 \%$.

This copper grade is designated either Cu-DHP or CW024A.

6.2 Mechanical properties

The tensile strength and elongation shall conform to the requirements given in Table 1. The test shall be carried out in accordance with 8.2.