SLOVENSKI STANDARD
SIST EN 12735-1:2010

01-oktober-2010

Nadomešča:
SIST EN 12735-1:2002
SIST EN 12735-1:2002/A1:2005

Baker in bakrove zlitine - Nevarjene okrogle bakrene cevi za hladilno in klimatsko tehniko - 1. del: Cevi za napeljave

Copper and copper alloys - Seamless, round copper tubes for air conditioning and refrigeration - Part 1: Tubes for piping systems

Kupfer und Kupferlegierungen - Nahtlose Rundrohre aus Kupfer für die Kälte- und Klimatechnik - Teil 1: Rohre für Leitungssysteme

Cuivre et alliages de cuivre - Tubes ronds sans soudure en cuivre pour l'air conditionné et la réfrigération - Partie 1: Tubes pour canalisations

Ta slovenski standard je istoveten z: **EN 12735-1:2010**

ICS:

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

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12735-1

July 2010

ICS 23.040.15

Supersedes EN 12735-1:2001

English Version

Copper and copper alloys - Seamless, round copper tubes for air conditioning and refrigeration - Part 1: Tubes for piping systems

Cuivre et alliages de cuivre - Tubes ronds sans soudure en cuivre pour l'air conditionné et la réfrigération - Partie 1: Tubes pour canalisations

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This European Standard was approved by CEN on 12 June 2010.

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 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 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

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Foreword

This document (EN 12735-1:2010) 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 January 2011, and conflicting national standards shall be withdrawn at the latest by January 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 12735-1:2001.

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 EU Directive 97/23/EC Pressure Equipment Directive (PED).

For relationship with EU Directive 97/23/EC, 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 12735-1:2001.

EN 12735-1, *Copper and copper alloys — Seamless, round copper tubes for air conditioning and refrigeration — Part 1: Tubes for piping systems*

In comparison with the first edition of EN 12735-1:2001 the following significant technical changes were made:

a) The size range has been increased (108 mm to 133 mm);

b) EN 10002-1 replaced by EN ISO 6892-1;

c) EN 10232 replaced by EN ISO 8491;

d) EN 10234 replaced by EN ISO 8493.

This European Standard “*Copper and copper alloys — Seamless, round copper tubes for air conditioning and refrigeration*" consists of two parts:

- *Part 1: Tubes for piping systems*;

- *Part 2: Tubes for equipment*.

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 12735-2, *Copper and copper alloys — Seamless, round copper tubes for air conditioning and refrigeration — Part 2: Tubes for equipment*

— EN 13348, *Copper and copper alloys — Seamless, round copper tubes for medical gases or vacuum*

— 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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 against EN ISO 9001.

NOTE Appropriate precautions should be taken if applying insulating material because it could be detrimental to the copper tube.

1 Scope

This European Standard specifies the requirements, sampling, test methods and conditions of delivery for seamless round copper tubes used for refrigeration and air-conditioning piping systems (i.e. piping, connections, repairs).

It is applicable to tubes with an outside diameter from 3 mm up to and including 133 mm.

These tubes are supplied in straight lengths in the material conditions hard or half-hard, or in coils in the annealed material condition.

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

EN 1173:2008, *Copper and copper alloys — Material condition designation*

EN 1655:1997, *Copper and copper alloys — Declarations of conformity*

EN 1971, *Copper and copper alloys — Eddy current test for tubes*

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

EN ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method (ISO 6507-1:2005)*

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

EN ISO 8493, *Metallic materials — Tube — Drift-expanding test (ISO 8493:1998)*

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

[EN 1057:2006, definition 3.1]

3.2
coil
winding in which the turns either are arranged into layers parallel to its axis such that successive turns in a given layer are next to one another (LWC – Level Wound Coil) or are spirally arranged (SWC – Spiral Wound Coil)

3.3
mean diameter
arithmetical mean of the maximum and minimum outside diameters through the same cross-section of the tube

[EN 1057:2006, definition 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

[EN 1057:2006, definition 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

[EN 1057:2006, definition 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

[EN 1057:2006, definition 3.8]

3.7
permanently marked
marked in such a way that the marking will remain readable up to the end of the life on the installation

EXAMPLE stamping, etching or engraving

[EN 1057:2006, definition 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

[EN 1057:2006, definition 3.10]

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 12735-1);

— material condition designation (see Table 1);

— nominal cross-sectional dimensions in millimetres: outside diameter × wall thickness (see Table 2).

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 28 mm, nominal wall thickness 1,5 mm, shall be designated as follows:

Copper tube — EN 12735-1 — R290 — 28 × 1,5

Denomination

Number of this European Standard

Material condition designation

Nominal cross-sectional dimensions in millimetres

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 (length, mass);

b) denomination (Copper tube);

c) reference to this European Standard (EN 12735-1);

d) material condition designation (see 4.2 and Table 1);

e) nominal cross-sectional dimensions: outside diameter × wall thickness (see Table 2);

f) nominal length (see 10.2);

g) form of delivery (see 10.3).

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

h) whether a declaration of conformity is required (see 9.1);

i) whether an inspection document is required, and if so, which type (see 9.2).

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

In addition, the purchaser shall also state on the enquiry and order any special requirements, if required.

EXAMPLE 1 Ordering details for 500 m copper tube conforming to EN 12735-1, in material condition R290 (hard), nominal outside diameter 28 mm, nominal wall thickness 1,5 mm, nominal length 5 m, straight lengths:

500 m Copper tube EN 12735-1 — R290 — 28 × 1,5
— 5 m straight lengths

EXAMPLE 2 Ordering details for 5 tonnes copper tube conforming to EN 12735-1, in material condition R220 (annealed), nominal outside diameter 12 mm, nominal wall thickness 1,0 mm, nominal length 25 m, in coils:

5 tonnes Copper tube EN 12735-1 — R220 — 12 × 1,0
— 25 m coils

6 Requirements

6.1 Composition

The composition shall conform to the following requirements:

Cu + Ag: min. 99,90 %;
0,015 % ≤ P ≤ 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.