

**Vask ja vasesulamid. Õmbluseta
ümmargused vasesest vee- ja gaasitorud
sanitaarvaldkonnas kasutamiseks ja
kütmiseks**

Copper and copper alloys - Seamless, round copper
tubes for water and gas in sanitary and heating
applications

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 1057:2006 sisaldab Euroopa standardi EN 1057:2006 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 29.06.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 1057:2006 consists of the English text of the European standard EN 1057:2006.</p> <p>This document is endorsed on 29.06.2006 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
--	---

<p>Käsitlusala: See Euroopa standard määrab kindlaks proovivõtu, katsetusmeetodite ja tarnetingimuste nõuded vasktorude kohta, mille välisläbimõõt on 6 mm kuni 267 mm (267 mm kaasa arvatud).</p>	<p>Scope: This European Standard specifies the requirements, composition, properties, sampling, test methods and conditions of delivery for seamless round copper tubes. It is applicable to tubes having an outside diameter from 6 mm up to and including 267 mm.</p>
---	--

ICS 23.040.15

Võtmesõnad: gaasitorud, katsed, keemiline koostis, kuumutamine, mehaanilised omadused, mõõtmed, mõõtmeterantsid, sanitaarseadmed, tähistus, vasesulamid, vask, vasktoru, veetorud, õmbluseta torud

English Version

Copper and copper alloys - Seamless, round copper tubes for
water and gas in sanitary and heating applications

Cuivre et alliages de cuivre - Tubes ronds sans soudure en
cuivre pour l'eau et le gaz dans les applications sanitaires
et de chauffage

Kupfer und Kupferlegierungen - Nahtlose Rundrohre aus
Kupfer für Wasser- und Gasleitungen für
Sanitärinstallationen und Heizungsanlagen

This European Standard was approved by CEN on 23 March 2006.

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 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.

CEN members are the national standards bodies of Austria, Belgium, 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: rue de Stassart, 36 B-1050 Brussels

Contents

Page

Foreword.....	4
Introduction.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions.....	8
4 Designations.....	9
4.1 Material.....	9
4.1.1 General.....	9
4.1.2 Symbol.....	9
4.1.3 Number.....	9
4.2 Material condition.....	9
4.3 Product.....	9
5 Ordering information.....	10
6 Material characteristics.....	11
6.1 Safety in case of fire – Reaction to fire.....	11
6.2 Properties at high temperature.....	11
6.3 Weldability.....	11
7 Requirements.....	11
7.1 Composition.....	11
7.2 Mechanical properties.....	11
7.3 Dimensions and tolerances.....	14
7.3.1 General.....	14
7.3.2 Nominal dimensions.....	14
7.3.3 Tolerances on outside diameter.....	15
7.3.4 Tolerances on wall thickness.....	16
7.3.5 Tolerances on length.....	16
7.4 Freedom from defects.....	17
7.5 Surface quality.....	17
7.6 Bending.....	17
7.7 Drift expanding.....	17
7.8 Flanging.....	17
8 Evaluation of conformity.....	18
8.1 General.....	18
8.2 Type testing.....	18
8.2.1 Initial type testing.....	18
8.2.2 Sampling, testing and conformity criteria.....	19
8.3 Factory production control (FPC).....	19
8.3.1 General.....	19
8.3.2 General FPC requirements.....	20
8.3.3 Manufacturer-specific FPC system requirements.....	20
9 Sampling.....	21
10 Test methods.....	22
10.1 Analysis.....	22
10.2 Tensile test.....	22
10.3 Hardness test.....	22
10.4 Carbon content test.....	22
10.5 Carbon film test.....	22
10.6 Bending test.....	22
10.7 Drift-expanding test.....	23
10.8 Flanging test.....	23
10.9 Freedom from defects tests.....	24
10.10 Retests.....	24

11	Inspection documentation	24
12	Marking and form of delivery	24
12.1	Marking	24
12.2	Form of delivery	25
Annex A	(normative) Standardized dimensions for reconsideration at a future revision.....	26
Annex B	(normative) Carbon film test	27
B.1	Preparation of the test piece	27
B.2	Procedure	27
B.3	Detection and assessment of films.....	27
Annex C	(normative) Freedom from defects tests	28
C.1	Eddy current test	28
C.2	Hydrostatic test	28
C.3	Pneumatic test	28
Annex ZA	(informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive (CPD) 89/106/EEC	30
ZA.1	Scope and relevant characteristics	30
ZA.2	Procedure(s) for attestation of conformity of pipes	32
ZA.2.1	System(s) of attestation of conformity	32
ZA.2.2	EC Certificate and Declaration of conformity	33
ZA.3	CE marking and labelling	34
Annex ZB	(informative) Relationship between this European Standard and the Essential Requirements of the EU Pressure Equipment Directive (PED) 97/23/EC.....	36
Bibliography	37
Tables		
Table 1	— Mechanical properties	12
Table 2	— Minimal elongation values for R250 (half hard) material condition tubes	13
Table 3	— Standardized dimensions	15
Table 4	— Tolerances on outside diameter	16
Table 5	— Tolerances on wall thickness	16
Table 6	— Quantitative and qualitative specification for carbon residues	17
Table 7	— Testing of bending, drift expanding and flanging	18
Table 8	— Sampling rate	21
Table 9	— Minimum radius of curvature	23
Table 10	— Recommended form of delivery	25
Table A.1	— Standardized dimensions for reconsideration at a future revision	26
Table C.1	— Maximum drill diameters for the reference standard tube	28
Table C.2	— Hydraulic pressure test	28
Table ZA.1	— Relevant clauses	31
Table ZA.2	— Systems of attestation of conformity	32
Table ZA.3.1	— Assignment of evaluation of conformity tasks for pipes under system 3 — 1/5	33
Table ZA.3.2	— Assignment of evaluation of conformity tasks for pipes under system 4 — 2/5	33
Table ZB.1	— Correspondence between this European Standard and Directive 97/23/EC	36

Foreword

This document (EN 1057:2006) 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 November 2006, and conflicting national standards shall be withdrawn at the latest by February 2008.

This document supersedes EN 1057:1996.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 3 "Copper tubes (installation and industrial)" to prepare the revision of the following standard:

EN 1057:1996, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

This document has been prepared within the framework of two mandates given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the EU Construction Products Directive (CPD) 89/106/EEC and the EU Pressure Equipment Directive (PED) 97/23/EC.

For relationship with EU Directives, see informative Annexes ZA and ZB, which are integral parts of this document.

In comparison with the first edition of EN 1057:1996, the following significant technical changes were made:

- harmonization of the standard to the Construction Product Directive (CPD) and to the Pressure Equipment Directive (PED);
- introduction of two new definitions: "permanently marked" and "durably marked";
- updating of the definitions regarding soldering, brazing, fusion welding, braze welding and mean diameter;
- introduction of five new items in Clause 5 "Ordering information" regarding options on tests and documents;
- due to the process of harmonization to the CPD, introduction of three new characteristics in Clause 6 "Material characteristics" inherent to copper material which are not to be tested;
- modification of Table 3 "Standardized dimensions";
- simplification of Table 6 "Quantitative and qualitative specification for carbon residues": Suppression of the residual and potential carbon and application of the thresholds to the total carbon;
- text in Clause 8 "Evaluation of conformity" added due to the process of harmonization to the CPD;
- for permanent and durable markings, specification of their applicability in 12.1 "Marking";
- modification of the table in Annex A, introduction of new diameters and wall thicknesses;
- due to the process of harmonization to the CPD and PED introduction of Annexes ZA and ZB.

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

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 copper tubes for air conditioning and refrigeration — Part 1: Tubes for piping systems*

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, 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

Products in conformity with this European Standard are considered suitable for drinking water applications subject to either

- a) compliance with any national regulations in the country of intended destination; or
- b) compliance in due course with the proposed European Acceptance Scheme (EAS) that will introduce common EU requirements for testing for fitness for contact with drinking water. When the EAS is implemented, this European Standard will have added to it a special Annex (Z/EAS) to incorporate the provisions of the EC mandate M/136 and a) will no longer be applicable.

This European Standard provides the basis for the assessment of a manufacturer's production process for products manufactured in accordance with this European Standard. The assessment could be based on initial and continuing surveillance of the factory production control system which could be concurrent with an assessment of the manufacturer's quality management system against EN ISO 9001.

Regulatory marking and the means by which regulatory marking is applied, is dealt with in Annex ZA.

Tubes having an outside diameter of not more than 108 mm are suitable for soldering, brazing or assembling by mechanical compression, collared, push-fit or press fittings. For tubes having an outside diameter of more than 108 mm, assembly should preferably be performed by welding or braze welding.

Reference can be made to this European Standard for tubes intended for other applications or for the transportation of other fluids. In such cases special requirements (for specifications, conditioning or delivery conditions) can be agreed between the purchaser and the supplier.

NOTE Appropriate precautions should be taken if applying insulating/protecting 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.

It is applicable to tubes having an outside diameter from 6 mm up to and including 267 mm for:

- distributing networks for hot water and cold water;
- hot water heating systems, including panel heating systems (under-floor, wall, overhead);
- domestic gas and liquid fuel distribution;
- waste water sanitation.

It is also applicable to seamless round copper tubes intended to be pre-insulated before use for any of the above purposes.

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 carbon on the inner surface of copper tubes or fittings*

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

EN 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

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

EN ISO 8491, *Metallic materials — Tube (in full section) — Bend test (ISO 8491:1998)*

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

EN ISO 8494, *Metallic materials — Tube — Flanging test (ISO 8494:1998)*

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

EN ISO 9001, *Quality management systems — Requirements (ISO 9001:2000)*

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*

NOTE Informative references to documents used in the preparation of this standard, and cited at the appropriate places in the text, are listed in the Bibliography.