

**Vask ja vasesulamid. Ühendusteta, ümarad  
vasktorud vaakumi jaoks või meditsiinilistele  
gaasidele**

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

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 13348:2008 sisaldab Euroopa standardi EN 13348:2008 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 25.09.2008 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 13.08.2008.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 13348:2008 consists of the English text of the European standard EN 13348:2008.

This standard is ratified with the order of Estonian Centre for Standardisation dated 25.09.2008 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 13.08.2008.

The standard is available from Estonian standardisation organisation.

ICS 23.040.15

**Võtmesõnad:** form of delivery, gas circuits, gas pipes, marking, mechanical properties, medical gases, pipelines, pipes, seamless, seamless pipes, seamless tubes, specification (approval), specifications, testing, tubes, vacuum, vacuum tubes

### 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](http://www.evs.ee); Telefon: 605 5050; E-post: [info@evs.ee](mailto:info@evs.ee)

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 30 May 2008.

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, 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.....	3
Introduction.....	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions.....	6
4 Designations.....	7
5 Ordering information.....	8
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.....	19
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Pressure Equipment Directive (PED) 97/23/EC.....	20
Bibliography.....	21
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 — Testing of bending and drift expanding.....	14
Table 6 — Sampling rate.....	14
Table 7 — Minimum radius of curvature.....	15
Table 8 — Maximum drill diameters for the reference standard tube.....	16
Table 9 — Recommended form of delivery.....	18
Table ZA.1 — Correspondence between this European Standard and Directive 97/23/EC.....	20

## Foreword

This document (EN 13348:2008) 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 February 2009, and conflicting national standards shall be withdrawn at the latest by February 2009.

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 13348:2001 and EN 13348:2001/A1:2005.

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

For relationship with EU Directive 97/23/EC, see informative Annex ZA, which is an integral part of this document.

Relationship with EU Directive MDD 93/42/EEC: Copper tubes according to EN 13348 cannot be considered as medical devices according EU Directive MDD 93/42/EEC.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 3 "Copper tubes (installation and industrial)" to revise EN 13348:2001:

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

In comparison with the first edition of EN 13348:2001, the following significant technical changes were made:

- a) The size range has been increased (6 mm to 133 mm);
- b) EN 10232 replaced by EN ISO 8491;
- c) EN 10234 replaced by EN ISO 8493.

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 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 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, 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

It is recommended that tubes manufactured to this 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.

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

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

This document is a preview generated by EVS

## 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 133 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 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.

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

EN 1057:2006, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

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

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

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)*

ISO 857-2:2005, *Welding and allied processes — Vocabulary — Part 2: Soldering and brazing processes and related terms*

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]