

**Vask ja vasesulamid. Soojusvahetite õmblusteta
ümartorud**

**Copper and copper alloys - Seamless, round tubes for
heat exchangers**

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12451:2012 sisaldab Euroopa standardi EN 12451:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 12451:2012 consists of the English text of the European standard EN 12451:2012.
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English Version

Copper and copper alloys - Seamless, round tubes for heat exchangers

Cuivre et alliages de cuivre - Tubes ronds sans soudure
pour échangeurs thermiques

Kupfer und Kupferlegierungen - Nahtlose Rundrohre für
Wärmeaustauscher

This European Standard was approved by CEN on 20 April 2012.

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Foreword

This document (EN 12451:2012) 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of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

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 12451:1999.

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/EU, see informative Annex ZA, which is an integral part of this document.

In comparison with EN 12451:1999, the following significant technical changes were made:

a) for Cu-DHP (CW024A):

- 1) the material condition R220 in Table 2 was added;
- 2) elongation values were modified for R250 and R290.

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

EN 12451:1999, *Copper and copper alloys — Seamless, round tubes for heat exchangers*

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 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*

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1 Scope

This European Standard specifies the composition, property requirements and tolerances on dimensions and form for seamless round drawn copper and copper alloy tubes for heat exchangers, condensers, evaporators and desalination equipment. It is applicable to copper and copper alloy tubes supplied in the size range from 6 mm up to and including 76 mm outside diameter and from 0,5 mm up to and including 3 mm wall thickness.

The sampling procedures and the methods of test for verification of conformity to the requirements of this European Standard are also specified.

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 1655, *Copper and copper alloys — Declarations of conformity*

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 16090, *Copper and copper alloys — Estimation of average grain size by ultrasound*

EN ISO 196, *Wrought copper and copper alloys — Detection of residual stress — Mercury (I) nitrate test (ISO 196)*

EN ISO 2624, *Copper and copper alloys — Estimation of average grain size (ISO 2624)*

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

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

seamless round tube

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

3.2

mean wall thickness

arithmetical mean of the maximum and minimum wall thicknesses at the same cross-section of the tube