

Copper and copper alloys — Rolled, finned, seamless tubes for heat exchangers

The European Standard EN 12452:1999 has the status of a British Standard

ICS 77.150.30

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents



Document Sharing Hub

National foreword

This British Standard is the English language version of EN 12452:1999.

The UK participation in its preparation was entrusted by Technical Committee NFE/34, Copper and copper alloys, to Subcommittee NFE/34/1, Wrought and unwrought copper and copper alloys, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Standards Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Find” facility of the BSI Standards Electronic Catalogue.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 19 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard, having been prepared under the direction of the Engineering Sector Committee, was published under the authority of the Standards Committee and comes into effect on 15 November 1999

© BSI 11-1999

Amendments issued since publication

Amd. No.	Date	Comments

ISBN 0 580 32796 5

ICS 77.120.30; 77.140.90

English version

Copper and copper alloys — Rolled, finned, seamless tubes for
heat exchangers

Cuivre et alliages de cuivre — Tubes sans soudure à
ailettes pour échangeurs thermiques

Kupfer und Kupferlegierungen — Nahtlose, gewalzte
Rippenrohre für Wärmeaustauscher

This European Standard was approved by CEN on 14 June 1999.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

cen

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

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Contents

	Page		Page
Foreword	3	8.6 Retests	11
1 Scope	4	8.7 Rounding of results	12
2 Normative references	4	9 Declaration of conformity and inspection documentation	12
3 Definitions	5	9.1 Declaration of conformity	12
4 Designations	6	9.2 Inspection documentation	12
4.1 Material	6	10 Marking, packaging, labelling	12
4.2 Material condition	6	Table 1: Composition of copper and copper alloys	13
4.3 Product	6	Table 2: Mechanical properties of copper and copper alloy tubes before finning	14
5 Ordering information	7	Table 3: Tolerances on outside diameter	14
6 Requirements	8	Table 4: Tolerances on length	15
6.1 Composition	8	Table 5: Tolerances on fin pitch	15
6.2 Mechanical properties	8	Table 6: Sampling rate	15
6.3 Dimensions and tolerances	8	Annex A (informative) Bibliography	16
6.4 Tolerances of form	9	Annex B (normative) Freedom from defects tests	17
6.5 Surface quality	9	Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives	19
6.6 Technological requirements	9		
7 Sampling	10		
7.1 General	10		
7.2 Analysis	10		
7.3 Mechanical tests	10		
8 Test methods	11		
8.1 Analysis	11		
8.2 Tensile test	11		
8.3 Hardness test	11		
8.4 Technological tests	11		
8.5 Freedom from defects tests	11		

Foreword

This European Standard 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 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This European Standard 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(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 3.2 "Tubes for general purposes" to prepare the following standard:

EN 12452

Copper and copper alloys – Rolled, finned, seamless tubes for heat exchangers

This European Standard 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 Directives.

For relationship with EU Directives, see Annex ZA (informative), which is an integral part of this standard.

This is one of a series of European Standards for copper and copper alloy tubes. Other products are, or will be, 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

prEN 12735-1

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

prEN 12735-2

Copper and copper alloys – Seamless, round copper tubes for air conditioning and refrigeration – Part 2: Tubes for equipment

prEN 13348

Copper and copper alloys – Seamless, round copper tubes for medical gases

prEN 13349

Copper and copper alloys – Pre-insulated copper tubes with solid covering

prEN 13600

Copper and copper alloys – Seamless copper tubes for electrical purposes

According to CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

1 Scope

This European Standard specifies the composition, property requirements and tolerances on dimensions and form for rolled, finned, seamless copper and copper alloy tubes for heat exchangers supplied in the size range from 6 mm up to and including 35 mm outside diameter and from 1 mm up to and including 3 mm wall thickness of the unfinned section with fin height up to and including 1,5 mm.

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

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 1655

Copper and copper alloys – Declarations of conformity

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

Metallic products – Types of inspection documents

EN 10234

Metallic materials – Tube – Drift expanding test

EN ISO 196

Wrought copper and copper alloys – Detection of residual stress – Mercury(I) nitrate test (ISO 196 : 1978)

EN ISO 2624

Copper and copper alloys – Estimation of average grain size (ISO 2624 : 1990)

EN ISO 6507-1

Metallic materials – Vickers hardness test – Part 1: Test method (ISO 6507-1:1997)

ISO 6957

Copper alloys – Ammonia test for stress corrosion resistance

NOTE: Informative references to documents used in the preparation of this standard, and cited at the appropriate places in the text, are listed in a bibliography, see annex A.

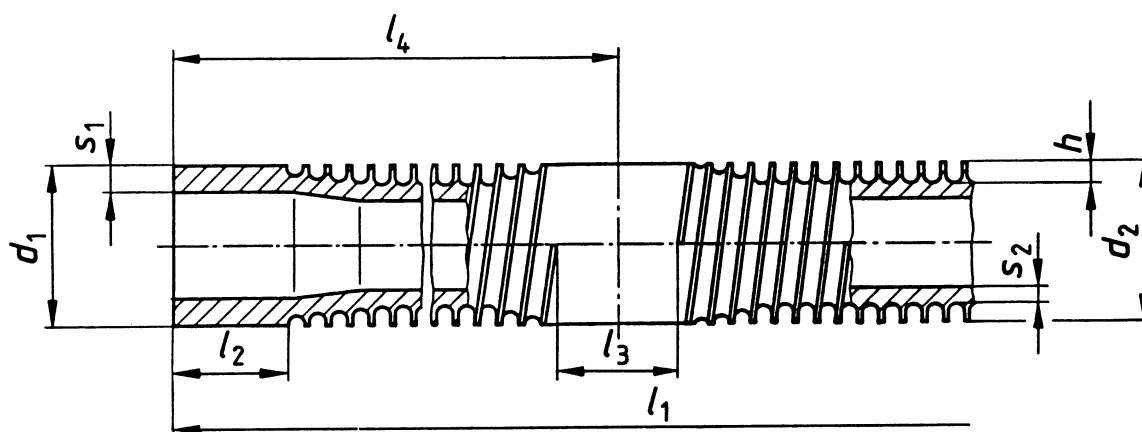
3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 rolled finned tube

Tube having a series of helical integral fins on the outside surface produced by cold forming (see figure 1).

The diameter over the fins will normally not exceed the diameter of the unfinned section. The inside surface can be specially shaped.



where:

- d_1 is the outside diameter of unfinned section;
- d_2 is the outside diameter of finned section;
- l_1 is the total tube length;
- l_2 is the length of unfinned tube end;
- l_3 is the length of unfinned intermediate section;
- l_4 is the distance from centre of the unfinned intermediate section to tube end;
- h is the fin height;
- s_1 is the wall thickness of unfinned section;
- s_2 is the wall thickness of finned section.

Figure 1: Rolled finned tube

3.2 deviation from circular form

Difference between the maximum and minimum outside diameters measured at any one cross section of the tube.