



SLOVENSKI STANDARD SIST EN 1254-1:2021

01-julij-2021

Nadomešča:
SIST EN 1254-1:1999

Baker in bakrove zlitine - Fitingi - 1. del: Fitingi za kapilarno mehko in trdo lotanje na bakrene cevi

Copper and copper alloys - Plumbing fittings - Part 1: Capillary fittings for soldering or brazing to copper tubes

Kupfer und Kupferlegierungen - Fittings Teil 1: Weich- und Kapillarlötfittings für Kupferrohre (Weich- und Hartlöten)

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Cuivre et alliages de cuivre - Raccords - Partie 1 : Raccords à braser par capillarité pour tubes en cuivre

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 1254-1

May 2021

ICS 23.040.40

Supersedes EN 1254-1:1998

English Version

**Copper and copper alloys - Plumbing fittings - Part 1:
Capillary fittings for soldering or brazing to copper tubes**

Cuivre et alliages de cuivre - Raccords - Partie 1 :
Raccords à braser par capillarité pour tubes en cuivre

Kupfer und Kupferlegierungen - Fittings - Teil 1:
Weich- und Hartkapillarlötfittings für Kupferrohre

This European Standard was approved by CEN on 23 November 2020.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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EN 1254-1:2021 (E)**European foreword**

This document (EN 1254-1:2021) 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 2021, and conflicting national standards shall be withdrawn at the latest by November 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1254-1:1998.

The main changes compared to EN 1254-1:1998 are:

- separation of test methods into part 20.

This part of the standard (EN 1254-1) should be read in conjunction with EN 1254-20:2021.

EN 1254 comprises the following parts under the general title “Copper and copper alloys — Plumbing fittings”:

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- *Part 1: Capillary fittings for soldering or brazing to copper tubes*
 - *Part 2: Compression fittings for use with copper tubes*
 - *Part 3: Compression fittings for use with plastics and multilayer pipes*
 - *Part 4: Threaded fittings*
 - *Part 5: Capillary fittings with short ends for brazing to copper tubes*
 - *Part 6: Push-fit fittings for use with metallic tubes, plastics and multilayer pipes*
 - *Part 7: Press fittings for use with metallic tubes*
 - *Part 8: Press fittings for use with plastics and multilayer pipes*
 - *Part 20: Definitions, thread dimensions, test methods, reference data and supporting information*

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Products complying with this document may be used for several fluids including the transport of water intended for human consumption if they comply with the relevant national, regional or local regulatory provisions applicable in the place of use.

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EN 1254-1:2021 (E)**1 Scope**

This document specifies product characteristics, assessment methods, compliance criteria of the test results and a designation system for fittings with ends for capillary soldering or capillary brazing for connecting with copper tubes e.g. EN 1057, EN 13348, EN 13349, EN 12735-1, EN 12735-2 etc. For the purposes of joining copper tubes, the fitting ends have a nominal diameter from 6 mm to 108 mm. These fitting ends exist in three forms: end feed fittings, integral solder and integral brazing ring fitting ends. The fittings are designed for a service lifetime up to fifty years.

The fittings are used up to the operating temperatures and corresponding maximum operating pressures as indicated in Annex A.

This document applies to copper alloy fittings. A non-exhaustive list of these copper alloys is given in CEN/TS 13388.

The capillary fittings for soldering or brazing to copper tubes are used with solder alloys in accordance with alloys specified in EN ISO 9453 and brazing alloys in accordance with alloys specified in EN ISO 17672.

Adaptor fittings for use with copper tubes may combine capillary soldering or capillary brazing ends with fitting ends defined in the other parts of EN 1254.

Capillary fittings for soldering or brazing may also have flanged end connections according to EN 1092-3.

Capillary fittings for soldering or brazing may also have a plated or other decorative surface coating.

Fittings can be produced by machining, metal forming, casting or fabrication.

Products covered by this document are intended to be used in:

a) liquid applications:

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- hot, cold or combined hot and cold water, including systems according to EN 806;
 - closed heating systems according to EN 12828;
 - cooling systems;
 - drainage systems;
 - fire protection systems including sprinkler systems according to EN 12845;
 - refrigeration systems;
 - supply systems for points of consumption with liquid fuels according to EN 12514.

b) gas applications:

- natural gas and liquefied petroleum gas systems with a maximum operating pressure less than or equal to 5 bar according to EN 1775;
- gas line systems with an operating pressure exceeding 0,5 bar for industrial installations and exceeding 5 bar for industrial and non-industrial installations according to EN 15001-1;
- compressed air systems;
- medical gas systems according to EN ISO 7396;
- refrigeration systems.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1057:2006+A1:2010, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1254-20:2021, *Copper and copper alloys — Plumbing fittings — Part 20: Definitions, thread dimensions, test methods, reference data and supporting information*

EN 10226-3, *Pipes threads where pressure tight joint are made on the threads — Part 3: Verification by means of limit gauges*

EN 12502-2, *Protection of metallic materials against corrosion — Guidance on the assessment of corrosion likelihood in water distribution and storage systems - Part 2: Influencing factors for copper and copper alloys*

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1)*

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

EN ISO 9453, *Soft solder alloys — Chemical compositions and forms (ISO 9453)*

EN ISO 17672, *Brazing — Filler metals (ISO 17672)*

ISO 7-2, *Pipe threads where pressure-tight joints are made on the threads — Part 2: Verification by means of limit gauges*

ISO 228-2, *Pipe threads where pressure-tight joints are not made on the threads — Part 2: Verification by means of limit gauges*

ISO 2859-1:1999, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1254-20:2021 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

EN 1254-1:2021 (E)**4 Product characteristics****4.1 Internal pressure**

When tested according to the method in 5.2 fittings shall show no signs of leakage or permanent distortion.

4.2 Tightness**4.2.1 Leak tightness under internal hydrostatic pressure**

Fittings assessed as indicated in 4.1 are considered to be leak tight under internal hydrostatic pressure.

4.2.2 Integrity of fabricated fitting bodies or having an 'as cast' microstructure

This requirement only applies to fitting bodies with an 'as cast' microstructure (excluding continuously cast materials) or fabricated by welding or brazing.

When tested according to the method in 5.3 fitting bodies shall show no visual indication of leakage.

4.3 Release of dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this document are placed on those markets. In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

NOTE An informative database covering European and national provisions on dangerous substances is available at the Construction website on EUROPA accessed through: <http://ec.europa.eu/growth/tools-databases/cp-ds>.

4.4 Durability

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4.4.1 Durability of internal pressure: Resistance to stress corrosion

Fittings manufactured from copper and copper-tin-zinc alloys (CuSnZnPb) shall be considered to be resistant to stress corrosion according to EN 12502-2 and copper-zinc-silicon alloys containing ≥ 2 % Si are also considered to be resistant.

Fittings manufactured from CuZn-alloys shall be considered to be resistant to stress corrosion when the product has a hardness $HBW_{10} 2,5/62,5 \leq 110$ measured according to EN ISO 6506-1 or a hardness $HV_5 \leq 134$ measured according to EN ISO 6507-1.

Fittings manufactured from copper alloys with a zinc content of 10 % or greater not mentioned above shall be tested and assessed according to 5.4.1, and shall show no evidence of cracking.

4.4.2 Durability of tightness**4.4.2.1 Residual carbon contamination in the bore****4.4.2.1.1 General**

Applies only to copper fittings and does not apply to copper alloy fittings.

4.4.2.1.2 Carbon film

When tested according to 5.4.2.1 there shall not be any visible carbon film.

4.4.2.1.3 Total carbon

When tested according to 5.4.2.2 the maximum total carbon level on internal surfaces shall not exceed 1,0 mg/dm².

4.4.2.2 Resistance to dezincification

This requirement only applies where a fitting is declared to be resistant to dezincification.

The resistance to dezincification of alloy fittings can be obtained by the correct material selection and processing of that material.

Alloys containing 15 % or less zinc provide a good resistance to dezincification and do not need to be tested.

Representative material samples, prior to machining, shall be tested. When tested according to 5.4.2.3, the mean and maximum depth of dezincification in any direction shall be expressed in μm and shall meet the acceptance criteria listed below for resistance to dezincification:

- for grade A: maximum 200 μm ;
- for grade B: mean not to exceed 200 μm and maximum not to exceed 400 μm .

If any of the test pieces do not meet the criteria for the chosen grade, a second lot of test samples from the same batch shall be selected and the test repeated. If any of the second lot of test pieces fails, then the batch represented shall be deemed not to conform to the requirements of this document.

If the user needs to heat a dezincification resistant alloy fitting to a temperature exceeding 550 °C for example for brazing, advice should be sought from the manufacturer.

4.5 Dimensional tolerances of diameters to achieve reliable capillary flow

In order to achieve the capillary flow of a solder or brazing alloy when making a connection, the dimensions of a socket or male end shall be tightly controlled.

When assessed according to the method specified in 5.5, the diameter shall be within the tolerances expressed in Table 1 for the relevant diameters.