

**01-julij-2021****Nadomešča:**  
**SIST EN 1254-5:2000**

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**Baker in bakrove zlitine - Fitingi - 5. del: Fitingi, ki imajo krajši konec prirejen za kapilarno trdo spajkanje na bakrene cevi**

Copper and copper alloys - Plumbing fittings - Part 5: Capillary fittings with short ends for brazing to copper tubes

Kupfer und Kupferlegierungen - Fittings - Teil 5: Kapillarlötfitings mit geringer Einstecktiefe zum Verbinden von Kupferrohren mittels Hartlöt

Cuivre et alliages de cuivre - Raccords - Partie 5 : Raccords à emboîture courte pour brasure forte par capillarité pour tubes en cuivre

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

# EN 1254-5

May 2021

ICS 23.040.40

Supersedes EN 1254-5:1998

English Version

## Copper and copper alloys - Plumbing fittings - Part 5: Capillary fittings with short ends for brazing to copper tubes

Cuivre et alliages de cuivre - Raccords - Partie 5 :  
Raccords à emboîture courte pour brasure forte par  
capillarité pour tubes en cuivre

Kupfer und Kupferlegierungen - Fittings - Teil 5:  
Kapillarlötfittings mit geringer Einstecktiefe zum  
Verbinden von Kupferrohren mittels Hartlötten

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.

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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**

## Contents

Page

European foreword.....	3
Introduction .....	4
1 Scope .....	5
2 Normative references .....	6
3 Terms and definitions .....	7
4 Product characteristics.....	7
4.1 Internal pressure .....	7
4.2 Tightness.....	7
4.3 Release of dangerous substances.....	7
4.4 Durability .....	7
4.5 Dimensional tolerances of diameters.....	8
4.6 Wall thickness for short ends for capillary brazing to copper tubes .....	9
4.7 Wall thickness at threaded portions of adaptor fittings.....	12
4.8 Dimensions of tail pipe ends for swivel fittings.....	12
4.9 Dimensions of gas union connectors .....	12
4.10 Threaded end dimensions .....	12
4.11 Other adapter ends (not defined in EN 1254-20:2021) .....	12
4.12 Length of engagement .....	13
4.13 Bore dimensions.....	14
4.14 Tube abutment.....	15
4.15 Alignment of the fitting ends.....	15
4.16 Shapes for tightening systems.....	15
4.17 Surface condition .....	15
4.18 Surface cleanliness for medical gases.....	15
5 Testing, assessment and sampling methods.....	16
5.1 General.....	16
5.2 Internal pressure .....	16
5.3 Tightness: Integrity of fabricated fitting bodies or having an 'as cast' microstructure .....	16
5.4 Durability .....	17
5.5 Dimensional tolerances of diameters.....	17
5.6 Wall thickness for short ends for capillary brazing to copper tubes .....	17
5.7 Wall thickness at threaded portions of adaptor fittings.....	17
5.8 Dimensions of tail pipe ends for swivel fittings.....	17
5.9 Dimensions of gas union connectors .....	17
5.10 Threaded end dimensions .....	18
5.11 Length of engagement .....	18
5.12 Bore dimensions.....	18
5.13 Alignment of the fitting ends.....	18
6 Evaluation of conformity .....	18
6.1 General.....	18
6.2 Type testing.....	18
6.3 Factory production control (FPC) .....	21
7 Designation.....	24
8 Marking, labelling and packaging .....	24
Annex A (normative) Operating temperatures and corresponding maximum operating pressures.....	25
Bibliography.....	26

## European foreword

This document (EN 1254-5:2021) 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 1254-5:1998.

The main changes to EN1254-5:1998 are:

- separation of test methods into part 20.

This part of the standard (EN 1254-5) 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”:

- *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.

**EN 1254-5:2021 (E)**

## **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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## 1 Scope

This document specifies product characteristics, assessment methods, compliance criteria of the test results and a designation system for capillary fittings with short ends for brazing to copper tubes e.g. EN 1057, EN 13348, EN 13349, EN 12735-1, EN 12735-2, etc. These fitting ends exist in two forms: end feed fittings and integral brazing ring fittings. For the purposes of joining copper tubes, the fitting ends have a nominal diameter from 14,7 mm to 159 mm. 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 with short ends for brazing to copper tubes are used with brazing alloys in accordance with alloys specified in EN ISO 17672.

Not all copper alloys that can be used to manufacture fittings can be brazed and those that can be brazed may require different brazing techniques (guidance is provided in EN 1254-20:2021, Annex A).

Fittings with short ends for capillary brazing may also have threaded end connections. These threaded ends exist with metallic and with non-metallic sealing elements. For the purposes of joining with tubes, pipes, fittings or valves, the threaded ends have a size range from 1/8" to 4".

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

Capillary fittings with short ends for brazing may also have flanged end connections according to EN 1092-3.

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:

- 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.

**EN 1254-5:2021 (E)**

## 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)*

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>

### 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

##### 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  $\geq 2$  % 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.

**EN 1254-5:2021 (E)****4.4.2 Durability of tightness: Residual carbon contamination in the bore****4.4.2.1 General**

This requirement only applies for copper fittings. This requirement does not apply for copper alloy fittings.

**4.4.2.2 Carbon film**

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

**4.4.2.3 Total carbon**

When tested according to 5.4.2.2 the maximum total carbon level on internal surfaces shall not exceed 1,0 mg/dm<sup>2</sup>.

**4.5 Dimensional tolerances of diameters**

In order to achieve the capillary flow of a 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.

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Table 1 — Tolerances on the nominal diameter

Values in millimetres

Nominal diameter <i>D</i>	Tolerances on the mean diameter <sup>a</sup> with respect to the nominal diameter <i>D</i>		Resulting diametrical difference	
	Outside diameter of male end	Inside diameter of socket	max.	min.
14,7	+0,04 -0,05	+0,15 +0,06	0,20	0,02
15				
16				
18				
21	+0,05 -0,06	+0,18 +0,07	0,24	0,02
22				
25				
27,4				
28				
34 <sup>b</sup>	+0,06 -0,07	+0,23 +0,09	0,30	0,03
35 <sup>b</sup>				
40 <sup>b</sup>				
40,5 <sup>b</sup>				
42 <sup>b</sup>				
53,6 <sup>b</sup>				
54 <sup>b</sup>				
64 <sup>b</sup>	+0,07 -0,08	+0,33 +0,10	0,41	0,03
66,7 <sup>b</sup>				
70 <sup>b</sup>				
76,1 <sup>b</sup>				
80 <sup>b</sup>				
88,9 <sup>b</sup>				
106 <sup>b</sup>	+0,20 -0,20	+0,70 +0,23	0,90	0,03
108 <sup>b</sup>				
133 <sup>b</sup>				
159 <sup>b</sup>				

<sup>a</sup> Arithmetical mean of two diameters at right angles in a cross-section taken anywhere on the length of the socket or of the male end except under indented marking or in the solder or brazing alloy groove.

<sup>b</sup> The brazing of tubes and fittings for these diameters requires more skilled techniques (further information is available in in EN 1254-20:2021, Annex A).

#### 4.6 Wall thickness for short ends for capillary brazing to copper tubes

When measured according to the method specified in 5.6, the minimum wall thickness shall be as expressed in Table 2 for the relevant diameters and different forms of the material.

The minimum wall thickness requirements do not apply under embossed marking on the socket end.