



SLOVENSKI STANDARD

oSIST prEN 1254-5:2019

01-september-2019

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: Hartkapillarlötfitings mit geringer Einstecktiefe zum Verbinden mit Kupferrohren

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

<https://standards.iteh.ai/catalog/standards/sist/0265a709-b166-454a-985e-0b74a90db136/osist-pr-en-1254-5-2019>

Ta slovenski standard je istoveten z: prEN 1254-5

ICS:

23.040.40	Kovinski fitingi	Metal fittings
77.150.30	Bakreni izdelki	Copper products

oSIST prEN 1254-5:2019

en,fr,de

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN 1254-5:2019](#)

<https://standards.iteh.ai/catalog/standards/sist/0265a709-b166-454a-985e-0b74a90db136/osist-pren-1254-5-2019>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 1254-5

June 2019

ICS 23.040.40

Will supersede 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:
Hartkapillarlötfittings mit geringer Einstecktiefe zum
Verbinden mit Kupferrohren

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 133.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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.....		4
Introduction		5
1	Scope	6
2	Normative references	7
3	Terms and definitions	8
4	Product characteristics.....	8
4.1	Internal pressure	8
4.2	Tightness.....	8
4.2.1	Leak tightness under internal hydrostatic pressure	8
4.2.2	Integrity of fabricated fitting bodies or having an 'as cast' microstructure	8
4.3	Release of dangerous substances.....	8
4.4	Durability	8
4.4.1	Durability of internal pressure	8
4.4.2	Durability of tightness.....	9
4.5	Dimensional tolerances of diameters.....	9
4.6	Wall thickness for short ends for capillary brazing to copper tubes.....	10
4.7	Wall thickness at threaded portions of adaptor fittings.....	13
4.8	Dimensions of tail pipe ends for swivel fittings.....	13
4.9	Dimensions of gas union connectors	13
4.10	Threaded end dimensions.....	13
4.11	Other adapter ends (not defined in prEN 1254-20:2019).....	13
4.12	Length of engagement	13
4.13	Bore dimensions.....	15
4.14	Tube abutment.....	17
4.15	Alignment of the fitting ends.....	17
4.16	Shapes for tightening systems.....	18
4.17	Surface condition	18
4.18	Surface cleanliness for medical gases.....	18
5	Testing, assessment and sampling methods	18
5.1	General.....	18
5.1.1	Preparation of fittings for testing.....	18
5.1.2	Test temperature	18
5.2	Internal pressure	18
5.3	Tightness.....	19
5.3.1	Integrity of fabricated fitting bodies or having an 'as cast' microstructure	19
5.4	Durability	19
5.4.1	Durability of internal pressure	19
5.4.2	Durability of tightness.....	19
5.5	Dimensional tolerances of diameters.....	19
5.6	Wall thickness for short ends for capillary brazing to copper tubes	19
5.7	Wall thickness at threaded portions of adaptor fittings.....	20
5.7.1	Type testing.....	20
5.7.2	FPC testing	20
5.8	Dimensions of tail pipe ends for swivel fittings.....	20
5.9	Dimensions of gas union connectors	20

5.9.1	Type testing	20
5.9.2	FPC testing.....	20
5.10	Threaded end dimensions.....	20
5.11	Length of engagement.....	20
5.12	Bore dimensions	20
5.13	Alignment of the fitting ends	20
6	Assessment and verification of constancy of performance - AVCP.....	21
6.1	General	21
6.2	Type testing	21
6.2.1	General	21
6.2.2	Test samples, testing and compliance criteria.....	22
6.2.3	Test reports	23
6.3	Factory production control (FPC).....	23
6.3.1	General	23
6.3.2	Requirements.....	23
6.3.3	Product specific requirements	27
6.3.4	Procedure for modifications.....	27
6.3.5	One-off products, pre-production products (e.g. prototypes) and products produced in very low quantity	27
7	Classification and designation	28
8	Marking, labelling and packaging.....	29
8.1	General	29
Annex A (normative)	Intended maximum operating temperatures and maximum operating pressures	30
Bibliography	31

<https://standards.iteh.ai/catalog/standards/sist/0265a709-b166-454a-985e-0b74a90db136/osist-pren-1254-5-2019>

prEN 1254-5:2019 (E)**European foreword**

This document (prEN 1254-5:2019) has been prepared by Technical Committee CEN/TC 133 “Copper and copper alloys”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1254-5:1998.

This part of the standard (EN 1254-5) should be read in conjunction with prEN 1254-20:2019.

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

The main changes to EN1254-5:1998 are:

- separation of test methods into part 20.

Introduction

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

iTeh STANDARD PREVIEW (standards.iteh.ai)

[oSIST prEN 1254-5:2019](https://standards.iteh.ai/catalog/standards/sist/0265a709-b166-454a-985e-0b74a90db136/osist-pren-1254-5-2019)

<https://standards.iteh.ai/catalog/standards/sist/0265a709-b166-454a-985e-0b74a90db136/osist-pren-1254-5-2019>

prEN 1254-5:2019 (E)**1 Scope**

This document specifies product characteristics, assessment methods, compliance criteria 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 size range 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 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 in prEN1254-20:2019, 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 standard are intended to be used in:

a) liquid applications:

- hot, cold or combined hot and cold water systems according to EN 806;
- closed heating systems according to EN 12828 and cooling systems;
- drainage systems;
- sprinkler systems according to EN 12845;
- refrigeration systems.

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;
- 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 806 (series), *Specifications for installations inside buildings conveying water for human consumption*

EN 1057:2006+A1:2010, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1092-3, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges*

prEN 1254-20:2019, *Copper and copper alloys — Plumbing fittings — Part 20: Definitions, thread dimensions, test methods, reference data and supporting information*

EN 1775, *Gas supply — Gas pipework for buildings — Maximum operating pressure less than or equal to 5 bar — Functional recommendations*

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 12735-1, *Copper and copper alloys — Seamless, round tubes for air conditioning and refrigeration — Part 1: Tubes for piping systems*

EN 12735-2, *Copper and copper alloys — Seamless, round tubes for air conditioning and refrigeration — Part 2: Tubes for equipment*

EN 12828, *Heating systems in buildings — Design for water-based heating systems*

EN 12845, *Fixed firefighting systems — Automatic sprinkler systems — Design, installation and maintenance*

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 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 7396, *Medical gas pipeline systems*

EN ISO 17672, *Brazing — Filler metals (ISO 17672:2016)*

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

prEN 1254-5:2019 (E)

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*

ISO 6957:1988, *Copper alloys — Ammonia test for stress corrosion resistance*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 1254-20:2019 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 <http://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 5.3.1 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 standard 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.

4.4 Durability**4.4.1 Durability of internal pressure****4.4.1.1 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 5.4.1.1, and shall show no evidence of cracking.

4.4.2 Durability of tightness

4.4.2.1 Residual carbon contamination in the bore

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

4.4.2.1.1 Carbon film

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

4.4.2.1.2 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.

4.5 Dimensional tolerances of diameters

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.

Table 1 — Tolerances on the nominal diameter
(standards.iteh.ai)

Values in millimetres

Nominal diameter <i>D</i>	Tolerances on the mean diameter ^a with respect to the nominal diameter <i>D</i>		Resulting diametrical difference	
	Outside diameter of male end	Inside diameter of socket	max.	min.
6	+0,04 -0,05	+0,15 +0,06	0,20	0,02
8				
10				
12				
14				
14,7				
15				
16				
18	+0,05 -0,06	+0,18 +0,07	0,24	0,02
21				
22				
25				
27,4				
28				

prEN 1254-5:2019 (E)

Nominal diameter D	Tolerances on the mean diameter ^a with respect to the nominal diameter D		Resulting diametrical difference	
	Outside diameter of male end	Inside diameter of socket	max.	min.
34 ^b	+0,06	+0,23	0,30	0,03
35 ^b	-0,07	+0,09		
40 ^b				
40,5 ^b				
42 ^b				
53,6 ^b				
54 ^b				
64 ^b	+0,07 -0,08	+0,33 +0,10	0,41	0,03
66,7 ^b				
70 ^b				
76,1 ^b				
80 ^b				
88,9 ^b				
106 ^b				
108 ^b	oSIST prEN 1254-5:2019 https://standards.iteh.ai/catalog/standards/sist/0265a709-b166-454a-985e-0b74a90db136/osist-pr-en-1254-5-2019			
133 ^b	+0,20	+0,70	0,90	0,03
159 ^b	-0,20	+0,23		

^a 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.

^b The soldering or brazing of tubes and fittings for these diameters requires more skilled techniques (further information is available in in prEN 1254-20:2019, 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.

In the case of integral solder or brazing ring fittings where a groove is made within the soldering or brazing length, the minimum wall thickness measured within or immediately adjacent the solder groove (see Figure 1) shall be in accordance with dimension e' in Table 2.