



SLOVENSKI STANDARD
oSIST prEN 1254-4:2019
01-september-2019

Baker in bakrove zlitine - Fitingi - 4. del: Fitingi z navojem

Copper and copper alloys - Plumbing fittings - Part 4: Threaded fittings

Kupfer und Kupferlegierungen - Fittings - Teil 4: Gewindeenden

Cuivre et alliages de cuivre - Raccords - Partie 4 : Raccords filetés

Ta slovenski standard je istoveten z: prEN 1254-4

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EUROPEAN STANDARD
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English Version

Copper and copper alloys - Plumbing fittings - Part 4: Threaded fittings

Cuivre et alliages de cuivre - Raccords - Partie 4 :
Raccords filetés

Kupfer und Kupferlegierungen - Fittings - Teil 4:
Gewindeenden

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

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COMITÉ EUROPÉEN DE NORMALISATION
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prEN 1254-4:2019 (E)**European foreword**

This document (prEN 1254-4:2019) 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 1254-4:1998, EN 1254-4:1998/AC:1999.

This part of the standard (EN 1254-4) 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 and for use with metallic tubes
- Part 8: Press and for use with plastics and multilayer pipes
- Part 20: Definitions, thread dimensions, test methods, reference data and supporting information

The main changes to EN1254-4:1998 are:

- focus on threaded fittings instead of threaded ends;
- separation of test methods and the geometrical description of the standardized threads 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.

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prEN 1254-4:2019 (E)**1 Scope**

This document specifies product characteristics, assessment methods, compliance criteria and a designation system for threaded fittings. 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 3,175 mm (1/8") to 101,6 mm (4"). The threaded 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.

Threaded fittings may also have flanged end connections according to EN 1092-3.

Threaded fittings 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:

- 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.

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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.

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 681-1:1996, *Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications - Part 1: Vulcanized rubber*

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

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

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

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*

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.

prEN 1254-4:2019 (E)**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 show no visual indication of leakage.

4.3 Resistance to high temperature (for heating networks)

The main aspect for the resistance to high temperature depends on the elastomeric sealing element. Therefore the elastomer shall have the appropriate characteristics as specified in EN 681-1. The elastomeric sealing elements shall conform to the requirements of EN 681-1:1996, Table 3 for continuous hot water supply up to 110 °C except for Isoprene-Isobutylene Copolymer (IIR) where a volume change in water up to and including 15 % is permitted.

Non-elastomeric sealing elements shall comply with their appropriate standard.

4.4 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.

4.5 Durability**4.5.1 Durability of internal pressure****4.5.1.1 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.

4.5.2 Durability of tightness**4.5.2.1 Resistance to dezincification**

Does not apply to fittings for gas applications.

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

Alloys containing 10 % or less zinc provide a good resistance to dezincification and don't need to be tested.

Representative material samples, prior to machining, shall be tested. When tested according to 5.4.2.1, 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 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 standard.

4.6 Wall thickness at threaded portions of fittings

This requirement only applies to fittings with an interface thread.

When assessed according to the method specified in 5.5 the minimum wall thickness at the interface thread shall be as expressed in prEN 1254-20:2019, 4.1 for the relevant diameters.

4.7 Dimensions of tail pipe ends for swivel fittings

This requirement only applies to tail pipe ends for swivel fittings.

When assessed according to the method specified in 5.6 the dimensions shall be as expressed in prEN 1254-20:2019, 4.2 for the thread size.

4.8 Dimensions of gas union connectors

This requirement only applies to fittings with gas union connectors.

When assessed according to the method specified in 5.7 the dimensions shall be as expressed in prEN 1254-20:2019, 4.3 for corresponding nominal size.

4.9 Threaded end dimensions

This requirement only applies to fitting bodies with threaded ends.

When assessed according to the method specified in 5.8 the thread shall be in accordance with prEN 1254-20:2019, 4.4.

4.10 Other adapter ends (not defined in prEN 1254-20:2019)

Other adapter ends, when assembled in accordance with the manufacturer's instructions and pressure tested according to the method in 5.2 shall show no signs of leakage or permanent distortion. When re-tested in accordance with the test method in 5.2 after disconnection and reconnection, it shall again show no signs of leakage or permanent distortion. If after disconnection the sealing element shows signs of damage, it shall be replaced before the second test.

4.11 Bore dimensions

To minimize flow resistance, minimum bore dimensions are required.

When assessed according to the test method in 5.9, the minimum bore shall be greater or equal to the values expressed in Table 1 for the relevant nominal diameter.

For unequal-ended or adaptor fittings, the smallest diameter shall apply provided that this diameter does not restrict other outlets.

Bores at threaded portions of fittings shall not restrict other outlets.

Table 1 — Minimum bore

Dimensions in millimetres

| Nominal diameter <i>D</i> mm | Minimum bore diameter mm | Minimum cross-sectional area mm ² |
|------------------------------------|-----------------------------|---|
| 6 | 4,0 | 12,6 |