SLOVENSKI STANDARD
SIST EN 1254-4:2021

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SIST EN 1254-4:2000
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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: Gewindefittings

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

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23.040.40	Kovinski fitingi	Metal fittings
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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: Gewindefittings

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Page

European foreword

This document (EN 1254-4:2021) 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of an identical text or by endorsement, at the latest by November 2021, and conflicting national standards shall be withdrawn at the latest by November 2021.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 1254-4:1998.

The main changes to EN 1254-4:1998 are:

— focus on threaded fittings instead of threaded ends;

— separation of test methods and the geometrical description of the standardized threads into part 20.

This part of the standard (EN 1254-4) 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 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*

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.

1 Scope

This document specifies product characteristics, assessment methods, compliance criteria of the test results 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 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.

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, includingsystems 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.

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 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 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 for the specific applications 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 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.

4.5 Durability

4.5.1 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 ≤ 110 measured according to EN ISO 6506-1 or a hardness HV_5 ≤ 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.

4.5.2 Durability of tightness: 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 don't need to be tested.

Representative material samples, prior to machining, shall be tested. When tested according to 5.4.2. 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.

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 EN 1254-20:2021, 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 EN 1254-20:2021, 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 EN 1254-20:2021, 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 EN 1254-20:2021, 4.4.

4.10 Other adapter ends (not defined in EN 1254-20:2021)

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 of the fitting shall be greater or equal to the values expressed in EN 1254-20:2021, 4.2 to 4.4 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.

4.12 Alignment of the fitting ends

When tested according to the method in 5.10, the alignment of the fitting ends with reference to the specified axis shall be within ± 2 °.

4.13 Shapes for tightening systems

When visually inspected, fittings with threads shall have a shape or suitable features for the transmission of tightening torques.

4.14 Surface condition

When visually inspected, fittings shall be free from sharp edges or burrs.

4.15 Plated or coated surfaces

Requirements for plated or coated surfaces shall be the subject of agreement between the purchaser and the manufacturer and shall not impair the performance of the joint.

5 Testing, assessment and sampling methods

5.1 General

5.1.1 Preparation of fittings for testing

Combinations of fitting size within a test rig are possible. The minimum distance between the fitting under test and each end of the assembly shall be 100 mm. Adaptor fittings used to connect the test pipework to a pump for example, may also be considered as a test fitting.

New fittings are required for each test.

NOTE See also EN 1254-20:2021, Annex A.

5.1.2 Test temperature

Tests shall be conducted at a temperature of (23 ± 5) °C unless otherwise stated.

5.1.3 Tolerances

When tolerances are not specified, the values shall be within ± 5 % of the nominal value.

5.2 Internal pressure

Use the test method described in EN 1254-20:2021, Clause 5 using the parameters shown in Table 1.

Table 1 — Hydrostatic pressure test parameters

Free length of the tube in the test assembly	Test pressure	Test duration
mm	bar	min
100	1,5 × maximum operating pressure	15
NOTE The maximum operating pressure is listed in Annex A.		

5.3 Tightness: Integrity of fabricated fitting bodies or having an 'as cast' microstructure

Test, after the final machining operation, using the test method described in EN 1254-20:2021, Clause 7 using the parameters shown in Table 2.

Table 2— Pneumatic pressure test parameters

Fitting type	Test pressure bar
Cast or fabricated bodies	5 ± 0,5

5.4 Durability

5.4.1 Durability of internal pressure: Resistance to stress corrosion

Use the test method described in EN 1254-20:2021, Clause 15.

5.4.2 Durability of tightness: Resistance to dezincification

Use the test method described in EN 1254-20:2021, Clause 17.