



SLOVENSKI STANDARD
oSIST prEN 1254-6:2019
01-september-2019

Baker in bakrove zlitine - Fitingi - 6. del: Fitingi s priključki "push-fit" za spajanje s kovinskimi, plastičnimi in večplastnimi cevmi

Copper and copper alloys - Plumbing fittings - Part 6: Push-fit fittings for use with metallic tubes, plastics and multilayer pipes

Kupfer und Kupferlegierungen - Fittings - Teil 6: Einsteckfittings für den Einsatz mit Metall-, Kunststoff- und Mehrschichtverbundrohren

Cuivre et alliages de cuivre - Raccords - Partie 6 : Raccords instantanés pour tubes métalliques, tuyaux en plastique et tubes multicouches

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Copper and copper alloys - Plumbing fittings - Part 6: Push-fit fittings for use with metallic tubes, plastics and multilayer pipes

Cuivre et alliages de cuivre - Raccords - Partie 6 :
Raccords instantanés pour tubes métalliques, tuyaux
en plastique et tubes multicouches

Kupfer und Kupferlegierungen - Fittings - Teil 6:
Einsteckfittings für den Einsatz mit Metall-, Kunststoff-
und Mehrschichtverbundrohren

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 1254-6:2019 (E)**European foreword**

This document (prEN 1254-6:2019) has been prepared by Technical Committee CEN/TC 133 “Copper and copper alloys”, the secretariat of which is held by DIN.

This document is a working document.

This document will supersede EN 1254-6:2012.

This part of the standard (EN 1254-6) 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 EN1254-6:2012 are:

- improved alignment with plastic and multilayer pipe standards for hot and cold water applications;
- 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.

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prEN 1254-6:2019 (E)**1 Scope**

This document specifies product characteristics, assessment methods, compliance criteria and a designation system for push-fit fittings for the purpose of joining tubes of copper, plated copper, multilayer pipes and plastics pipes. The fitting ends have a size range from 6 mm to 54 mm. The fittings are designed for a service lifetime up to fifty years.

This document is applicable to push-fit fittings for joining one or more of the following tubes or pipes:

- copper tubes to EN 1057; copper composite according to UNI 11342, plastic and multilayer pipes covered by EN 15015.

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.

Adaptor fittings may combine push-fit ends with fitting ends defined in the other parts of EN 1254.

Push-fit fittings for metallic tubes may also have flanged end connections according to EN 1092-3.

Push-fit 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 standard are intended to be used in 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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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 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 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 15015, *Plastics piping systems — Systems for hot and cold water not intended for human consumption — Performance characteristics for pipes, fittings and their joints*

EN ISO 3501, *Plastics piping systems — Mechanical joints between fittings and pressure pipes — Test method for resistance to pull-out under constant longitudinal force (ISO 3501)*

EN ISO 3503, *Plastics piping systems — Mechanical joints between fittings and pressure pipes — Test method for leaktightness under internal pressure of assemblies subjected to bending (ISO 3503)*

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 13056, *Plastics piping systems — Pressure systems for hot and cold water — Test method for leaktightness under vacuum (ISO 13056)*

EN ISO 15874-2, *Plastics piping systems for hot and cold water installations — Polypropylene (PP) — Part 2: Pipes (ISO 15874-2:2013)*

EN ISO 15874-5, *Plastics piping systems for hot and cold water installations — Polypropylene (PP) — Part 5: Fitness for purpose of the system (ISO 15874-5)*

EN ISO 15875-2, *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) — Part 2: Pipes (ISO 15875-2)*

EN ISO 15875-5, *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) — Part 5: Fitness for purpose of the system (ISO 15875-5)*

EN ISO 15876-2, *Plastics piping systems for hot and cold water installations — Polybutene (PB) — Part 2: Pipes (ISO 15876-2)*

EN ISO 15876-5, *Plastics piping systems for hot and cold water installations — Polybutene (PB) — Part 5: Fitness for purpose of the system (ISO 15876-5)*

EN ISO 15877-2, *Plastics piping systems for hot and cold water installations — Chlorinated poly(vinyl chloride) (PVC-C) — Part 2: Pipes (ISO 15877-2)*

EN ISO 15877-5, *Plastics piping systems for hot and cold water installations — Chlorinated poly(vinyl chloride) (PVC-C) — Part 5: Fitness for purpose of the system (ISO 15877-5)*

EN ISO 19892, *Plastics piping systems — Thermoplastics pipes and fittings for hot and cold water — Test method for the resistance of joints to pressure cycling (ISO 19892)*

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EN ISO 19893, *Plastics piping systems — Thermoplastics pipes and fittings for hot and cold water — Test method for the resistance of mounted assemblies to temperature cycling (ISO 19893)*

EN ISO 21003-2, *Multilayer piping systems for hot and cold water installations inside buildings — Part 2: Pipes (ISO 21003-2)*

EN ISO 21003-5, *Multilayer piping systems for hot and cold water installations inside buildings — Part 5: Fitness for purpose of the system (ISO 21003-5)*

EN ISO 22391-2, *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT) - Part 2: Pipes (ISO 22391-2)*

EN ISO 22391-5, *Plastics piping systems for hot and cold water installations - Polyethylene of raised temperature resistance (PE-RT) — Part 5: Fitness for purpose of the system (ISO 22391-5)*

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*

ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation*

ISO 9924-1, *Rubber and rubber products — Determination of the composition of vulcanizates and uncured compounds by thermogravimetry — Part 1: Butadiene, ethylene-propylene copolymer and terpolymer, isobutene-isoprene, isoprene and styrene-butadiene rubbers*

ISO 10508, *Plastics piping systems for hot and cold water installations — Guidance for classification and design*

UNI 11342, *Copper and copper alloys - Composite, seamless copper-PE, tubes for fluid distribution*

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 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.

4.2.2 Leak tightness under internal hydrostatic pressure

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

4.2.3 Resistance to pull-out

When tested according to the method in 5.3.2 the joint assemblies shall withstand the pull-out force without being separated and shall show no signs of leakage when subjected to the subsequent leak tightness under internal hydrostatic pressure test as described in 5.2.

4.2.4 Leak tightness under vibration

This requirement only applies for jointing with metallic tubes.

When tested according to the method in 5.3.3 fittings shall show no signs of leakage.

4.2.5 Leak tightness under static flexural force

This requirement only applies for jointing with metallic tubes and is not applicable on threaded ends.

When tested according to the method in 5.3.4 fittings shall show no signs of leakage or permanent distortion.

4.2.6 Leak tightness under internal hydrostatic pressure while subject to bending

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This requirement only applies for jointing with multilayer or plastics pipes.

When tested according to the method in 5.3.5 fittings shall show no signs of leakage or permanent distortion.

4.2.7 Leak tightness under vacuum

When tested according to the method in 5.3.6 the change in pressure shall not be greater than 0,05 bar at the conclusion of the test.

4.2.8 Leak tightness under temperature cycling

When tested according to the method in 5.3.7 fittings shall show no signs 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.

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.

prEN 1254-6:2019 (E)**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 $\geq 2\%$ 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 5.4.1.1, and shall show no evidence of cracking.

4.5.2 Durability of tightness**4.5.2.1 Residual carbon contamination in the bore**

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

4.5.2.1.1 Carbon film

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

4.5.2.1.2 Total carbon

When tested according to 5.4.2.2 the maximum total carbon level on internal surfaces shall not exceed $1,0 \text{ mg/dm}^2$.

4.5.2.2 Resistance to dezincification

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 5.4.2.3, 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 $200 \mu\text{m}$;
- for grade B: mean not to exceed $200 \mu\text{m}$ and maximum $400 \mu\text{m}$.

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.

4.5.2.3 Resistance to pressure cycling

When tested according to the method in 5.4.2.4 fittings shall show no signs of leakage.

4.5.3 Durability of resistance to high temperature (for heating networks)

When tested according to the method in 5.4.3 to one or more of the specified test durations, the reduction of elasticity of the sealing element shall be expressed as a percentage.