



SLOVENSKI STANDARD
oSIST prEN 1254-7:2019
01-september-2019

Baker in bakrove zlitine - Fitingi - 7. del: Fitingi s stiskalnimi priključki za spajanje s kovinskimi cevmi

Copper and copper alloys - Plumbing fittings - Part 7: Press fittings for use with metallic tubes

Kupfer und Kupferlegierungen - Fittings - Teil 7: Pressfittings für den Einsatz mit metallischen Rohren

Cuivre et alliages de cuivre - Raccords - Partie 7 : Raccords à sertir pour tubes métalliques

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Ta slovenski standard je istoveten z: prEN 1254-7

ICS:

23.040.40	Kovinski fittingi	Metal fittings
77.150.30	Bakreni izdelki	Copper products

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 1254-7

June 2019

ICS 23.040.40

English Version

Copper and copper alloys - Plumbing fittings - Part 7: Press fittings for use with metallic tubes

Cuivre et alliages de cuivre - Raccords - Partie 7 :
Raccords à sertir pour tubes métalliques

Kupfer und Kupferlegierungen - Fittings - Teil 7:
Pressfittings für den Einsatz mit metallischen Rohren

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.

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prEN 1254-7:2019 (E)**European foreword**

This document (prEN 1254-7:2019) 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 part of the standard (EN 1254-7) 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

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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 1254-7:2019 (E)**1 Scope**

This document specifies product characteristics, assessment methods, compliance criteria and a designation system for press fittings including their elastomeric seals, for connecting with metallic tubes. The fitting ends have a size range from 6 mm to 108 mm. The press fittings are designed for a service lifetime up to fifty years.

This document is applicable to press fittings for joining one or more of the following tubes:

- copper tubes to EN 1057 and
- stainless steel tubes to EN 10312

with wall thicknesses and tempers as specified by the manufacturer.

The fittings are used up to the operating temperatures and maximum operating pressures as indicated in Annex A.

Press fittings are used with tubes with wall thicknesses greater than or equal to the wall thickness given in Annex B, to ensure that tubes can withstand the radial pressing forces involved.

This document applies to copper alloy fittings. A non-exhaustive list of these copper alloys is given in CEN/TS 13388.

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

Press fittings for use with metallic tubes may also have flanged end connections according to EN 1092-3.

Press fittings for use with metallic tubes 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:

a) liquid applications:

- hot or 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.

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 549:1994, *Rubber materials for seals and diaphragms for gas appliances and gas equipment*

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

EN 682, *Elastomeric Seals — Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids*

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 1775:2007, *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 10312, *Welded stainless steel tubes for the conveyance of aqueous liquids including water for human consumption — Technical delivery conditions*

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*

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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 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*

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****4.1.1 For liquid applications**

When tested according to the method in 5.2.1 fittings shall show no signs of leakage or permanent distortion.

4.1.2 For gas applications

When tested according to the method in 5.2.2 fittings shall show no signs of leakage or permanent distortion.

4.2 Tightness**4.2.1 General requirements****4.2.1.1 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 5.3.1.1 fitting bodies shall show no visual indication of leakage.

4.2.2 Requirements for liquid applications**4.2.2.1 Leak tightness under internal hydrostatic pressure**

Fittings assessed as indicated in 4.1.1 are considered to be leak tight under internal hydrostatic pressure.

4.2.2.2 Resistance to pull-out

When tested according to the method in 5.3.2.1 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 5.2.1.

4.2.2.3 Leak tightness under vibration

When tested according to the method in 5.3.2.2 fittings shall show no signs of leakage.

4.2.2.4 Leak tightness under vacuum

When tested according to the method in 5.3.2.3 the change in pressure shall not be greater than 0,05 bar at the conclusion of the test.

4.2.2.5 Leak tightness under temperature cycling

When tested according to the method in 5.3.2.4 fittings shall show no signs of leakage.

4.2.2.6 Leak before press

If the manufacturer claims this feature, then when tested according to the method in 5.3.2.5 fittings shall leak at least one drop per second when tested with water or at least one bubble per second when tested pneumatically.

4.2.3 Requirements for gas applications**4.2.3.1 Leak tightness under internal pneumatic pressure**

Fittings assessed as indicated in 4.1.2 are considered to be leak tight under internal pneumatic pressure.

4.2.3.2 Resistance to pull-out

When tested according to the method in 5.3.3.1 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 pneumatic pressure test as described in 5.2.2.

4.2.3.3 Leak tightness under vibration

When tested according to the method in 5.3.3.2 fittings shall show no signs of leakage.

4.2.3.4 Leak tightness under static flexural force

This requirement is not applicable on threaded ends.

When tested according to the method in 5.3.3.3 fittings shall show no signs of leakage or permanent distortion.

4.2.3.5 Leak tightness under temperature cycling

When tested according to the method in 5.3.3.4 fittings shall show no signs of leakage.

4.2.3.6 Leak before press

If the manufacturer claims this feature, then when tested according to the method in 5.3.3.5 fittings shall leak at least one air bubble per second when tested pneumatically.

4.2.3.7 Press fitting suited for fuel gas application inside buildings

The main aspect for the durability of tightness for fuel gas application inside buildings is the ozone behaviour of the elastomer. Therefore the elastomer shall be ozone resistant and comply with the requirements of EN 549 class B2 or higher.

prEN 1254-7:2019 (E)**4.2.3.8 Press fitting suited for fuel gas application outside buildings**

The main aspect for the durability of tightness for fuel gas application outside buildings depends on the elastomeric sealing element. Therefore the elastomer shall comply with the requirements of EN 682 types GAL or GBL.

4.2.3.9 Leak tightness at high temperature

Only applies for fuel gas applications, to copper press fittings with only press ends and not for adaptor fittings which also have a threaded end.

When tested according to the method in 5.3.3.6, at any point during the test period the nitrogen leakage rate from an equal ended straight copper fitting shall not exceed 150 dm³/h per tested product.

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.

4.5 Durability**4.5.1 Durability of internal pressure**

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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 HBW₁₀ 2,5/62,5 ≤ 110 measured according to EN ISO 6506-1 or a hardness HV₅ ≤ 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 for liquid applications**

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.