



SLOVENSKI STANDARD
oSIST prEN 1254-3:2019
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Baker in bakrove zlitine - Fitingi - 3. del: Fitingi z nakrčenima priključkoma za spajanje s plastičnimi in večplastnimi cevmi

Copper and copper alloys - Plumbing fittings - Part 3: Compression fittings for use with plastics and multilayer pipes

Kupfer und Kupferlegierungen - Fittings - Teil 3: Klemmverbindungen für Kunststoffrohre und Mehrschichtverbundrohre

Cuivre et alliages de cuivre - Raccords - Partie 3 : Raccords à compression pour tubes en plastique et multicouche

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Copper and copper alloys - Plumbing fittings - Part 3: Compression fittings for use with plastics and multilayer pipes

Cuivre et alliages de cuivre - Raccords - Partie 3 :
Raccords à compression pour tubes en plastique et
multicouche

Kupfer und Kupferlegierungen - Fittings - Teil 3:
Klemmverbindungen für Kunststoffrohre und
Mehrschichtverbundrohre

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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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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prEN 1254-3:2019 (E)**European foreword**

This document (prEN 1254-3:2019) 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 1254-3:1998.

This part of the standard (EN 1254-3) 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 EN1254-3:1998 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 1254-3:2019 (E)**1 Scope**

This document specifies product characteristics, assessment methods, compliance criteria of test results and a designation system for fittings with compression ends for use with plastic and multilayer pipes which are defined in the applicable pipe standard. For the purposes of joining plastics pipes, the fitting ends have a size range from 10 mm to 160 mm. The fittings are designed for a service lifetime up to fifty years.

The compression 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 for use with plastic and multilayer pipes may combine compression ends with fitting ends defined in the other parts of EN 1254.

Compression fittings for use with plastic and multilayer pipes may also have flanged end connections according to EN 1092-3.

Compression fittings for use with plastic and multilayer pipes 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, 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 (not valid for multilayer pipes):

- 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 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 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)*
- 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)*

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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)*

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*

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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 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*

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 Leak tightness under vacuum

When tested according to the method in 5.3.2.1 the change in pressure shall not be greater than 0,05 bar at the conclusion of the test.

4.2.2.3 Leak tightness under temperature cycling

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

4.2.2.4 Resistance to pull-out

When tested according to the method in 5.3.1.2 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 5.2.1.

4.2.2.5 Leak tightness under internal hydrostatic pressure while subject to bending

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

When tested according to the method in 5.3.2.3 fittings shall show no signs of leakage or permanent distortion.

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.

prEN 1254-3:2019 (E)**4.2.3.2 Resistance to pull-out**

When tested according to the method in 5.3.1.2 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 5.2.2

4.2.3.3 Leak tightness under temperature cycling

When tested according to the test method in 5.3.3.1 fittings shall show no signs of leakage.

4.2.3.4 Leak tightness under internal hydrostatic pressure while subject to bending

When tested according to the method in 5.3.3.1 fittings shall show no signs of leakage or permanent distortion.

4.2.3.5 Compression 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.

4.2.3.6 Compression 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.

4.3 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****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.