

FINAL  
DRAFT

AMENDMENT

ISO  
15875-3:2003  
FDAM 2

ISO/TC 138/SC 2

Secretariat: SNV

Voting begins on:  
2021-07-06

Voting terminates on:  
2021-08-31

---

---

## Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) —

### Part 3: Fittings

iTeh **AMENDMENT 2** REVIEW  
(standards.iteh.ai)

*Systèmes de canalisations en plastique pour les installations d'eau chaude et froide — Polyéthylène réticulé (PE-X) —*

*ISO 15875-3:2003/FDAmD 2*

*Partie 3: Raccords*

<https://standards.iteh.ai/catalog/standards/sist/88111233-dd51-49de-8b12-8641e1111111/iso-15875-3-2003-fdamd-2>

**AMENDMENT 2**

**ISO/CEN PARALLEL PROCESSING**

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.



Reference number  
ISO 15875-3:2003/FDAM 2:2021(E)

© ISO 2021

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO 15875-3:2003/FDAmd 2](https://standards.iteh.ai/catalog/standards/sist/88111233-dd51-49de-8b12-864742e9136f/iso-15875-3-2003-fdamd-2)  
<https://standards.iteh.ai/catalog/standards/sist/88111233-dd51-49de-8b12-864742e9136f/iso-15875-3-2003-fdamd-2>



### **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2021

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 2, *Plastics pipes and fittings for water supplies*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 155, *Plastics piping systems and ducting systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all parts in the ISO 15875 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[ISO 15875-3:2003/FDAmd 2](https://standards.iteh.ai/catalog/standards/sist/88111233-dd51-49de-8b12-864742e9136f/iso-15875-3-2003-fdamd-2)

<https://standards.iteh.ai/catalog/standards/sist/88111233-dd51-49de-8b12-864742e9136f/iso-15875-3-2003-fdamd-2>

# Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X) —

## Part 3: Fittings

### AMENDMENT 2

#### Normative references

Add the following normative references:

ISO 2768-1, *General tolerances — Part 1: Tolerances for linear and angular dimensions without individual tolerance indications*

ISO 2768-2, *General tolerances — Part 2: Geometrical tolerances for features without individual tolerance indications*

ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 6509-1, *Corrosion of metals and alloys — Determination of dezincification resistance of copper alloys with zinc — Part 1: Test method*

ISO 6957, *Copper alloys — Ammonia test for stress corrosion resistance*

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

ISO 15875-3:2003/FDAmd 2  
<https://standards.iteh.ai/catalog/standards/sist/8b12-864742e9136f/iso-15875-3-2003-fdamd-2>

Delete the following normative reference:

EN 1254-3, *Copper and copper alloys — Plumbing fittings — Part 3: Fittings with compression ends for use with plastics pipes*

#### Terms and definitions

Replace the existing definition 3.1.1. with the following:

#### 3.1.1

##### **compression fitting**

fitting with internal support in which the joint is made by screwing a union nut along a thread to compress a ring on the outside wall of the pipe and finally to cause a clamping of the pipe between the ring and the inner support of the fitting

Note 1 to entry: The fitting may be with or without sealing element.

Replace the existing definition 3.1.2 with the following:

### 3.1.2

#### **radial press fitting**

fitting with internal support in which the joint is made by a radial compression of a ring with a pressing tool on the outside wall of the pipe to cause a clamping of the pipe between the ring and the inner support of the fitting

Note 1 to entry: The fitting may be with or without sealing element.

Add the following terms and definitions after 3.1.4:

### 3.1.5

#### **axial press fitting**

fitting with internal support in which the joint is made by an axial movement of a sleeve with a pressing tool to cause a clamping of the pipe between the sleeve and the inner support of the fitting

Note 1 to entry: The fitting may be with or without sealing element.

### 3.1.6

#### **push-fit fitting**

fitting which incorporates a sealing element, a gripping device and uses an internal support

Note 1 to entry: The joint is made by pushing the pipe into the fitting and a seal is achieved without the use of heat or tools.

Note 2 to entry: In some designs, this type of joint can be disconnected and re-connected or disconnected and the fitting re-used elsewhere.

Note 3 to entry: The internal support can be an integrated part of the fitting or a separate part (supporting sleeve).

### 3.1.7

#### **radial shrink fitting**

fitting with internal support in which the joint is made by a radial shrinking of the PE-X pipe and a previously expanded ring made of visco-elastic plastics material on the outside wall of the pipe to cause a clamping of the pipe between the ring and the inner support of the fitting

Note 1 to entry: The fitting may be with or without sealing element.

Note 2 to entry: The internal support can be an integrated part of the fitting or a separate part (supporting sleeve).

## 4.2

Replace the existing subclause 4.2 with the following:

### **4.2 Metallic fitting material**

Metallic materials for fittings intended to be used with components conforming to ISO 15875 shall be either copper alloys or stainless steel alloys. The alloys shall be defined according to a standard or regulatory document.

NOTE Examples for such standards and regulatory documents are listed in the Bibliography.

For copper alloys, the fittings made thereof shall comply with the corrosion resistance requirements according to 8.2.

## 5.1

Replace the existing subclause 5.1 with the following:

## 5.1 Appearance

### 5.1.1 Appearance of plastics fittings

When viewed without magnification, the internal and external surfaces of fittings shall be smooth, clean and free from scoring, cavities and other surface defects to an extent that would prevent conformance with this document. The material shall not contain visible impurities. Slight variations in appearance of the colour shall be permitted. Each end of a fitting shall be perpendicular to its longitudinal axis.

### 5.1.2 Appearance of metal fittings

When viewed without magnification, the internal and external surfaces of fittings shall be clean, free from any residues from the production (e.g. free from cast sand, grease or release agent) and shall have no sharp edges or cracks.

## 5.2

Replace the existing title of subclause 5.2 with the following:

## 5.2 Opacity of plastics fittings

STANDARD PREVIEW  
(standards.iteh.ai)

## 6.1, first sentence

ISO 15875-3:2003/FDAmd 2

Replace the existing first sentence of subclause 6.1 with the following two sentences:

<https://standards.iteh.ai/catalog/standards/sist/88111233-dd51-49de-8612-864742e91361/iso-15875-3-2003-fdamd-2>

Dimensions of plastic fittings shall be measured in accordance with ISO 3126.

Dimensions of metal fittings shall be measured in accordance with ISO 2768-1 and/or ISO 2768-2.

## 6.3

Replace the existing subclause 6.3 with the following:

## 6.3 Dimensions of metallic fittings — Minimum wall thickness of fittings made of copper alloys

The minimum wall thickness shall be measured with a calibrated micrometer or equivalent instrument. The wall thickness shall be measured at three or more discrete places and efforts shall be made to find the minimum.

The minimum wall thickness at points A, B and C of the fitting made from rods or by pressing or by casting (see Figure A.1, Figure A.2 and Figure A.3) shall be in accordance with Annex A, Table A.1.

The minimum wall thickness specified does not apply along the cone angle or to the thickness of the loose ring or sleeve where such a ring or sleeve has been or is intended to be deformed to form a seal. It also does not apply to internal pipe supports.

Clause 8

Replace the existing Clause 8 with the following:

**8 Physical and chemical characteristics of fittings**

**8.1 Physical and chemical characteristics of plastics fittings**

When determined in accordance with ISO 10147, the degree of crosslinking of injection moulded fittings made from crosslinked polyethylene shall conform to Table 5.

**Table 5 — Degree of crosslinking**

Crosslinking process	Degree of crosslinking
Peroxide	≥70 %
Silane	≥65 %
Electron beam	≥60 %
Azo	≥60 %

**8.2 Physical and chemical characteristics of metallic fittings**

**8.2.1 Fittings made of copper alloys — Resistance to stress corrosion**

Fittings made of copper alloys shall be resistant to stress corrosion.

Fittings manufactured from copper-tin-zinc alloys (e.g. CuSnZnPb) and copper-zinc-silicon alloys containing ≥2 % Si are deemed to be resistant to stress corrosion.

Fittings manufactured from CuZn-alloys are deemed to be resistant to stress corrosion when the product has a hardness HBW 2,5/62,5 ≤ 110 measured according to ISO 6506-1 or a hardness HV<sub>5</sub> ≤ 134 measured according to ISO 6507-1.

Other fittings manufactured from copper alloys with a zinc content of 10 % or greater not mentioned in the previous paragraphs shall be tested according to ISO 6957 using a test solution of pH 9,5 without prior pickling. The fittings shall not show any evidence of cracking.

**8.2.2 Fittings made of copper alloys — Resistance to dezincification**

This requirement only applies where a fitting made of copper alloy 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.

Copper alloys containing 15 % or less zinc provide a good resistance to dezincification and may be declared accordingly without testing.

For casted and wrought fittings, representative fitting samples shall be used.

For machined fittings, either representative fitting samples or alternatively representative material samples, prior to machining, shall be tested.

The samples shall be tested according to ISO 6509-1. The following acceptance criteria shall be met:

- Maximum dezincification depth: ≤200 μm
- Average dezincification depth: ≤100 μm



NOTE The requirement is a copy of ISO 6509-2:2017, Table 1, line (a).

11.2, Table 6, 4th line

Replace:

"Nominal wall thickness(es) of the corresponding pipe(s) (for compression or crimped fittings only)"

by:

"Nominal wall thickness(es) of the corresponding pipe(s) (for compression, radial press, axial press, push-fit or radial shrink fittings only)".

Clause 12

Add the following new Clause 12 after the end of Clause 11:

### **12 Fittings made from cast alloys — Tightness test**

In order to identify cavities or holes that may cause leakage, fittings manufactured from casting alloys shall be tested on leak tightness. The tightness test has to be conducted after machining of the casted fitting. The fittings shall not show any form of leakage.

The tightness shall be tested by the use of compressed air with a pressure  $\geq 0,5$  MPa (5 bar), when the fitting is immersed in water. Air bubbles indicate a leakage.

NOTE Alternative test methods can be applied.

[ISO 15875-3:2003/FDAmd 2](https://standards.iteh.ai/catalog/standards/sist/88111233-dd51-49de-8b12-864742e9136f/iso-15875-3-2003-fdamd-2)

<https://standards.iteh.ai/catalog/standards/sist/88111233-dd51-49de-8b12-864742e9136f/iso-15875-3-2003-fdamd-2>

Annex A

Add the following annex after Clause 12, before the Bibliography:

## Annex A (normative)

### Dimensional requirements for metallic fittings — Minimum wall thickness of fittings made of copper alloys

The minimum wall thickness at points A, B and C of the fitting made from rods or by pressing or by casting (see Figure A.1, Figure A.2 and Figure A.3) shall be in accordance with Table A.1.

**Table A.1 — Minimum wall thickness of fittings made of copper alloys**

Dimensions in millimetres

Nominal diameter <i>D</i>	Minimum wall thickness of fittings made of copper alloys at points A, B and C	
	Machined and wrought fittings	Cast fittings
10	1,0	1,0
12	1,1	1,1
14		
14,7	1,2	1,2
15		
16		
17	1,4	1,4
18		
20		
21		
22		
25		
26		
27,4		
28		
32		
34	1,6	1,8
40		
40,5	1,8	2,0
50		
53,6	1,9	2,3
63		
75	2,0	2,4
75	2,6	2,8
90	2,9	3,1
110	3,3	3,5
125	3,7	3,9
140	4,1	4,3
160	4,6	4,8