

---

---

**Plastics piping systems for the supply  
of gaseous fuels for maximum operating  
pressure up to and including 0,4 MPa  
(4 bar) — Polyamide (PA) —**

**Part 3:  
Fittings**

iTeh STANDARD PREVIEW

(standards.it) *Systèmes de canalisations en matières plastiques pour la distribution  
de combustibles gazeux pour une pression maximale de service  
inférieure ou égale à 0,4 MPa (4 bar) — Polyamide (PA) —*

ISO 15439-3:2007  
**Partie 3: Raccords**

[https://standards.it/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007](https://standards.it/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007)



**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

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

[ISO 15439-3:2007](#)

<https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2007

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 15439-3 was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 4, *Plastics pipes and fittings for the supply of gaseous fuels*.

ISO 15439 consists of the following parts, under the general title *Plastics piping systems for the supply of gaseous fuels for maximum operating pressure up to and including 0,4 MPa (4 bar) — Polyamide (PA)*:

— Part 1: *General*

[ISO 15439-3:2007](https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007)

— Part 2: *Pipes*

<https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007>

— Part 3: *Fittings*

## Introduction

As polyamide material is used for piping systems for the supply of gaseous fuels both at very low pressure and high pressure, ISO/TC 138/SC 4 experts decided to split the standardization programme over two standards, one for low pressure up to 4 bar, one for high pressure up to 20 bar.

On the one hand, thin wall thickness pipes and solvent cement joints are used typically for pressure up to 4 bar, on the other hand, thicker wall thickness pipes and butt fusion, electrofusion and mechanical joints are typically used for pressure up to 20 bar. For technical and safety reasons, it is not possible to mix the components of the two types of piping systems (thin wall thickness pipes cannot be jointed by butt fusion or mechanical joints and vice and versa). Especially, solvent cement joints are not used for jointing for high pressure piping systems.

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

[ISO 15439-3:2007](https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007)

<https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007>

# Plastics piping systems for the supply of gaseous fuels for maximum operating pressure up to and including 0,4 MPa (4 bar) — Polyamide (PA) —

## Part 3: Fittings

### 1 Scope

This part of ISO 15439 specifies the physical and mechanical characteristics of fittings made from polyamide in accordance with Part 1, intended to be buried and used for the supply of gaseous fuels for maximum operating pressure up to and including 4 bar.

It also specifies the test parameters for the test methods to which it refers.

This part of ISO 15439 also lays down requirements for dimensions and the marking of fittings.

In conjunction with parts 1 and 2 of ISO 15439 it is applicable to PA fittings, their joints and to joints with components of PA.

[ISO 15439-3:2007](https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-c2a02bd4718/iso-15439-3-2007)

These fittings can be of the following types:

- solvent cement socket fittings;
- solvent cement spigot fittings;
- solvent cement saddle fittings.

### 2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 307, *Plastics — Polyamides — Determination of viscosity number*

ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method*

ISO 1167-4, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 4: Preparation of assemblies*

ISO 3126, *Plastics piping systems — Plastics components — Determination of dimensions*

ISO 15439-1, *Plastics piping systems for the supply of gaseous fuels for maximum operating pressure up to and including 0,4 MPa (4 bar) — Polyamide (PA) — Part 1: General*

ISO 15439-2:2007, *Plastics piping systems for the supply of gaseous fuels for maximum operating pressure up to and including 0,4 MPa (4 bar) — Polyamide (PA) — Part 2: Pipes*

### 3 Terms and definitions

For the purposes of this document, the terms and the definitions, symbols and abbreviations given in ISO 15439-1 apply.

### 4 Material

The fittings shall be made from virgin material. Rework material shall not be used.

The compound from which the fittings are made shall conform to ISO 15439-1. It may be unpigmented.

### 5 Appearance

When viewed without magnification, the internal and external surfaces of the fitting shall be smooth, clean and free from scoring, cavities and other surface defects to an extent that would prevent conformity of the fitting to this part of ISO 15439.

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

### 6 Geometrical characteristics

[ISO 15439-3:2007](https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007)

#### 6.1 Measurement of dimensions

<https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007>

The dimensions of the fittings shall be measured in accordance with ISO 3126. In case of dispute, the measurement of dimensions shall be made not less than 24 h after manufacture after being conditioned for at least 4 h at  $(23 \pm 2)$  °C.

#### 6.2 Dimensions of solvent cement socket fittings

##### 6.2.1 Diameters and lengths of sockets

When measured in accordance with 6.1, the diameters, lengths and tapers of sockets (see Figure 1) shall be as specified in Table 1.

##### 6.2.2 Wall thicknesses

The minimum wall thickness  $e_{\min}$  of the fittings shall be as specified in Table 1.

#### 6.3 Dimensions of solvent cement spigot fittings

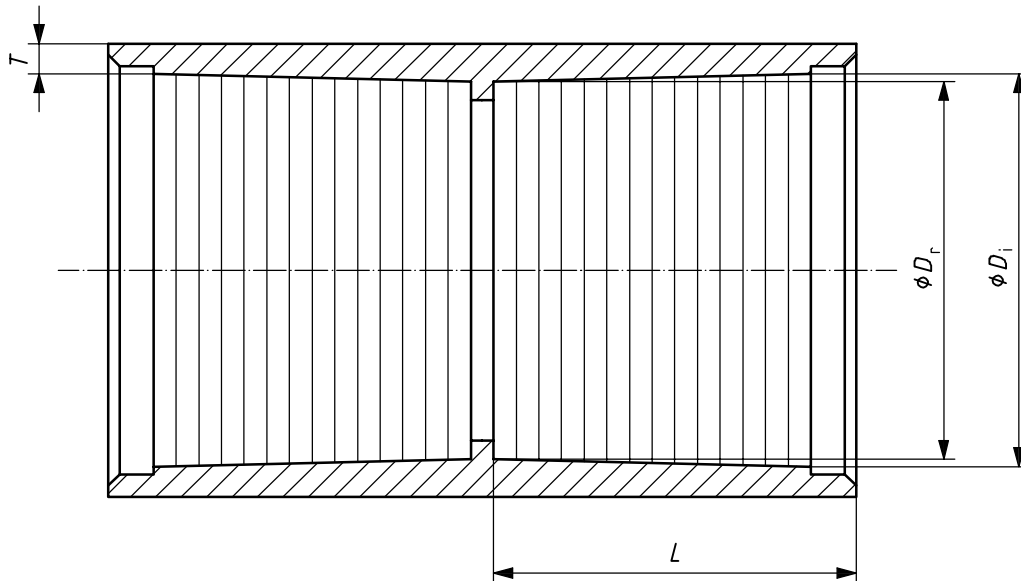
##### 6.3.1 Diameters and lengths of the spigots

When measured in accordance with 6.1, the spigot lengths shall conform to the minimum socket length,  $L$ , as specified in Table 1.

The mean outside diameters of the spigot ends,  $d_{em}$ , shall be as specified in Table 1 of ISO 15439-2:2007.

### 6.3.2 Wall thicknesses

The minimum wall thicknesses  $e_{\min}$  of the fittings shall be as specified in Table 1.



#### Key

$D_i$  is the mean inside diameter measured in the plane of the socket mouth;

$D_r$  is the inside diameter measured in the plane of the socket root;

$L$  is the length of the socket;

$T$  is the wall thickness of the body of the fitting;

<https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007>

**Figure 1 — Socket dimensions**

Table 1 — Dimensions of sockets

Dimensions in millimetres

Nominal outside diameter $d_n$	Mean mouth diameter		Socket length, minimum $L_{min}$	Wall thickness, minimum $e_{min}$	Taper, maximum <sup>a</sup> $D_i - D_r$
	$D_{i,min}$	$D_{i,max}$			
12	11,6	11,9	30	2,5	0,2
16	15,6	15,9	30	2,5	0,2
18	17,6	17,9	30	2,5	0,2
20	19,6	19,9	32	2,5	0,2
23	22,6	22,9	32	2,5	0,2
25	24,6	24,9	32	2,5	0,2
32	31,6	31,9	32	3,0	0,3
40	39,6	39,9	40	3,0	0,3
50	49,6	49,9	50	4,2	0,4
63	62,5	62,9	63	4,6	0,4
75	74,5	74,9	75	5,0	0,6
90	89,4	89,9	90	5,5	0,6
110	109,4	109,9	110	6,0	0,7
125	124,4	124,9	125	7,5	0,7
140	139,4	139,9	140	8,1	0,8
160	159,3	159,9	160	8,9	0,9
180	179,3	179,9	180	9,7	1,0
200	199,2	199,9	200	10,5	1,1
225	224,2	224,9	225	11,5	1,2
250	249,1	249,9	250	12,5	1,3

<sup>a</sup> The socket root diameter,  $D_r$ , shall not be greater than the socket mouth diameter,  $D_i$ , i.e. taper is not mandatory in the socket.

**6.4 Dimensions of solvent cement saddle fittings**

The minimum wall thicknesses  $e_{min}$  of the saddle fittings shall be as specified in Table 1. Other dimensions are dependent on the saddle design geometry and shall be specified by the manufacturer.

**7 Mechanical characteristics**

**7.1 Conditioning**

Unless otherwise specified by the applicable test method, the test pieces shall be conditioned for at least 16 h at 23 °C and 50 % relative humidity in accordance with ISO 291 before testing in accordance with Table 2.

**7.2 Requirements**

When tested in accordance with the test methods as specified in Table 2 using the indicated parameters, the fitting shall have mechanical characteristics conforming to the requirements given in Table 2.



Test specimens shall consist of a solvent-cement pipe-to-fitting assembly prepared in accordance with the manufacturer's instructions. The setting time of the solvent cement shall be a minimum of 24 h at normal laboratory atmosphere.

**Table 2 — Mechanical characteristics**

Characteristic	Requirements	Test parameters		Test method
Hydrostatic strength (20 °C, 1 000 h)	No failure during the test period of any test piece	End caps Orientation Conditioning time Type of test Circumferential (hoop) stress PA 11 160 and PA 12 160 PA 11 180 and PA 12 180 Test period Test temperature	Type a) Free 6 h Water-in-water  19,0 MPa 20,0 MPa 1 000 h 20 °C	ISO 1167-1 ISO 1167-4
Hydrostatic strength (80 °C, 165 h)	No failure during the test period of any test piece	End caps Orientation Conditioning time Type of test Circumferential (hoop) stress PA 11 160 and PA 12 160 PA 11 180 and PA 12 180 Test period Test temperature	Type a) Free 6 h Water-in-water  10,0 MPa 11,5 MPa 165 h 80 °C	ISO 1167-1 ISO 1167-4

iTeH STANDARD PREVIEW  
(standards.iteh.ai)

## 8 Physical characteristics

[ISO 15439-3:2007](https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007)

### 8.1 Conditioning

<https://standards.iteh.ai/catalog/standards/sist/79407c49-aafc-4f31-9504-cc2a02bd4718/iso-15439-3-2007>

Unless otherwise specified by the applicable test method, the test pieces shall be conditioned for at least 16 h at 23 °C and 50 % relative humidity in accordance with ISO 291 before testing in accordance with Table 3.

### 8.2 Requirement

When tested in accordance with the test method as specified in Table 3 using the indicated parameters, the fittings shall have physical characteristics conforming to the requirement given in Table 3.

**Table 3 — Physical characteristics**

Characteristic	Requirement	Test parameters		Test method
Viscosity number	≥ 180 ml/g	Solvent	m-Cresol	ISO 307

## 9 Marking

### 9.1 General

All fittings shall be permanently and legibly marked in such a way that the marking does not initiate cracks or other types of failure.

If printing is used, the colour of the printed information shall differ from the basic colour of the product.

The marking shall be such that it is legible without magnification.