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**Plastics piping systems for the supply  
of gaseous fuels — Polyethylene  
(PE) —**

**Part 4:  
Valves**

*Systèmes de canalisations en plastique pour la distribution des  
combustibles gazeux — Polyéthylène (PE) —*

*Partie 4: Robinets*



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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)

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## 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 7, *Valves and auxiliary equipment of plastics materials*.

This second edition cancels and replaces the first edition (ISO 4437-4:2015), which has been technically revised.

The main changes are as follows:

- PE 100-RC type materials with enhanced resistance to slow crack growth have been added;
- an improved description of the leaktightness test has been given. [Annex B](#) has been added to describe the leaktightness test after the tensile test, following the withdrawal of ISO 10933;
- test methods have been updated including new methods for PE 100-RC materials.

A list of all parts in the ISO 4437 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).

## Introduction

This document specifies the requirements for a piping system and its components made from polyethylene (PE) and intended to be used for the supply of gaseous fuels.

Requirements and test methods for material and components, other than valves, are specified in ISO 4437-1, ISO 4437-2 and ISO 4437-3.

Characteristics for fitness for purpose are covered in ISO 4437-5. CEN/TS 1555-7<sup>[2]</sup> gives guidance for assessment of conformity. Recommended practice for installation is given in ISO/TS 10839<sup>[1]</sup>.

This document covers the characteristics of valves.

The ISO 4437 series covers a range of maximum operating pressures and gives requirements concerning colours. It is the responsibility of the purchaser or specifier to make the appropriate selections from these aspects, taking into account their particular requirements and any relevant national regulations and installation practices or codes.

# Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) —

## Part 4: Valves

### 1 Scope

This document specifies the characteristics of valves made from polyethylene (PE) for piping systems in the field of the supply of gaseous fuels.

It is applicable to unidirectional and bi-directional isolating valves with spigot ends or electrofusion sockets intended to be fused with PE pipes or fittings conforming to ISO 4437-2 and ISO 4437-3 respectively.

Valves made from materials other than PE, designed for the supply of gaseous fuels conforming to the relevant standards can be used in PE piping systems according to ISO 4437 series, provided that they have PE connections for butt fusion or electrofusion ends, including integrated material transition joints, conforming to ISO 4437-3.

It also specifies the test parameters for the test methods referred to in this document.

In conjunction with parts 1, 2, 3 and 5 of the ISO 4437 series, this document is applicable to PE valves, their joints and to joints with components of PE and other materials intended to be used under the following conditions:

- a) a maximum operating pressure (MOP) up to and including 10 bar<sup>1)</sup> at a reference temperature of 20 °C for design purposes;

NOTE 1 For the purpose of this document and the references to ISO 8233, MOP is considered to be nominal pressure.

- b) an operating temperature between –20 °C to 40 °C.

NOTE 2 For operating temperatures between 20 °C and 40 °C, derating coefficients are defined in ISO 4437-5.

This document covers valve bodies designed for connection with pipes with a nominal outside diameter  $d_n \leq 400$  mm.

### 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.

ISO 1133-1, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method*

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*

1) 1 bar = 0,1 MPa = 10<sup>5</sup> Pa; 1 MPa = 1 N/mm<sup>2</sup>.

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

ISO 3127, *Thermoplastics pipes — Determination of resistance to external blows — Round-the-clock method*

ISO 4437-1, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 1: General*

ISO 4437-2, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 2: Pipes*

ISO 4437-3, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 3: Fittings*

ISO 4437-5, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 5: Fitness for purpose of the system*

ISO 8233, *Thermoplastics valves — Torque — Test method*

ISO 11357-6, *Plastics — Differential scanning calorimetry (DSC) — Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)*

ISO 16010, *Elastomeric seals — Material requirements for seals used in pipes and fittings carrying gaseous fuels and hydrocarbon fluids*

ISO 17778, *Plastics piping systems — Fittings, valves and ancillaries — Determination of gaseous flow rate/pressure drop relationships*

EN 736-1, *Valves — Terminology — Part 1: Definition of types of valves*

EN 736-2, *Valves — Terminology — Part 2: Definition of components of valves*

EN 1680, *Plastics piping systems — Valves for polyethylene (PE) piping systems — Test method for leaktightness under and after bending applied to the operating mechanisms*

EN 1704, *Plastics piping systems — Thermoplastics valves — Test method for the integrity of a valve after temperature cycling under bending*

EN 1705, *Plastics piping systems — Thermoplastics valves — Test method for the integrity of a valve after an external blow*

EN 12100, *Plastics piping systems — Polyethylene (PE) valves — Test method for resistance to bending between supports*

EN 12119, *Plastics piping systems — Polyethylene (PE) valves — Test method for resistance to thermal cycling*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4437-1, EN 736-1, EN 736-2 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

#### 3.1 General

##### 3.1.1

##### **external leaktightness**

leaktightness of the valve body enveloping the space containing the gas, with respect to the atmosphere