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Interested committees:

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 4437-3

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

Part 3: Fittings

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

Partie 3: Raccords

ICS: 83.140.30; 75.200

ISO/TC 138/SC 4

Secretariat: **NEN**

Voting begins on:
2025-06-05

Voting terminates on:
2025-08-28

This document is circulated as received from the committee secretariat.

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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 document 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).

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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.

This document 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*.

This second edition cancels and replaces the second edition (ISO 4437-3:2024), which has been technically revised.

The main changes are as follows:

- reference to information related to the suitability of PE pipe systems for 100 % hydrogen and its admixtures with natural gas has been made;
- terms and definitions have been distributed over ISO 4437-1, ISO 4437-2 and ISO 4437-3;
- symbols and their definitions for geometrical characteristics on electrofusion socket fittings, spigot end fittings, socket fusion fittings and tapping tees have been harmonized with other standards in ISO/TC 138;
- [Clause 5](#) has been restructured;
- the minimum bore for electrofusion socket fittings have been harmonized with the minimum bore for electrofusion of spigot end fittings;
- the performance requirements for joints have been mentioned more explicitly by adding [Table 8](#).

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.

Introduction

The ISO 4437 series specifies the requirements for a piping system and its components made from polyethylene (PE) compounds, which is intended to be used for the supply of gaseous fuels.

This document covers the characteristics of fittings.

Requirements and test methods for materials and components, other than fittings, are specified in ISO 4437-1, ISO 4437-2 and ISO 4437-4.

Characteristics for fitness for purpose of the system are covered in ISO 4437-5. ISO/TS 4437-7 gives guidance for assessment of conformity.

Recommended practice for design, handling and installation is given in ISO/TS 10839.

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

Part 3: Fittings

1 Scope

This document specifies the characteristics of fusion fittings made from polyethylene (PE) as well as of mechanical fittings for piping systems in the field of the supply of gaseous fuels.

NOTE 1 Additional information related to the installation of PE 100-RC systems is given in ISO/DIS 4437-1:2025, Annex A.

NOTE 2 Additional information about the suitability of PE pipe systems for hydrogen and its admixtures is given in ISO/DIS 4437-1:2025, Annex D.

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

In conjunction with ISO 4437-1, ISO 4437-2, ISO 4437-4 and ISO 4437-5, this document is applicable to PE pipes, fittings and valves, their joints, and 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 bar¹⁾, at a design reference temperature of 20 °C;
- b) an operating temperature between –20 °C and 40 °C.

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

The ISO 4437 series covers a range of MOPs and gives requirements concerning colours.

This document is applicable for fittings of the following types:

- electrofusion socket fittings;
- electrofusion saddle fittings;
- spigot end fittings (for butt fusion using heated tools and electrofusion);
- socket fusion fittings;
- mechanical fittings.

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 guidance or regulations and installation practices or codes.

NOTE 3 The fittings can be, for example, in the form of couplers, saddles, equal and reduced tees, reducers, elbows, bends or end caps.

NOTE 4 Fabricated fittings are normally not used for gas applications except for larger dimensions or in the absence of other solutions. Guidance can be found in ISO 4427-3:2019, Annex B.

1) 1 bar = 0,1 MPa = 10⁵ Pa; 1 MPa = 1 N/mm².

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 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation*

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 1167-1:2006, *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/DIS 4437-1:2025, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 1: General*

ISO/DIS 4437-2:2025, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 2: Pipes*

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

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

ISO 12176-5, *Plastics pipes and fittings — Equipment for fusion jointing polyethylene systems — Part 5: Two-dimensional data coding of components and data exchange format for PE piping systems*

ISO 13950, *Plastics pipes and fittings — Automatic recognition systems for electrofusion joints*

ISO 13951, *Plastics piping systems — Test method for the resistance of plastic pipe/pipe or pipe/fitting assemblies to tensile loading*

ISO 13953, *Polyethylene (PE) pipes and fittings — Determination of the tensile strength and failure mode of test pieces from a butt-fused joint*

ISO 13954, *Plastics pipes and fittings — Peel decohesion test for polyethylene (PE) electrofusion assemblies of nominal outside diameter greater than or equal to 90 mm*

ISO 13955, *Plastics pipes and fittings — Crushing decohesion test for polyethylene (PE) electrofusion assemblies*

ISO 13956, *Plastics pipes and fittings — Decohesion test of polyethylene (PE) saddle fusion joints — Evaluation of ductility of fusion joint interface by tear test*

ISO 13957, *Plastics pipes and fittings — Polyethylene (PE) tapping tees — Test method for impact resistance*

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*

ISO 17885:2021, *Plastics piping systems — Mechanical fittings for pressure piping systems — Specifications*

ISO 18488, *Polyethylene (PE) materials for piping systems — Determination of Strain Hardening Modulus in relation to slow crack growth — Test method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4437-1, ISO 4437-2 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

electrofusion socket fitting

fitting which contains one or more integrated heating elements that are capable of transforming electrical energy into heat to realize a fusion joint with a spigot end or a pipe

3.2

electrofusion saddle fitting

fitting which contains one or more integrated heating elements that are capable of transforming electrical energy into heat to realize a fusion joint onto a pipe

3.2.1

tapping tee

electrofusion saddle fitting (3.2) (top loading or wrap round) that contains a cutter to tap through the wall of the main pipe and remains in the body of this fitting

3.2.2

branch saddle

electrofusion saddle fitting (3.2) (top loading or wrap round) that requires an ancillary cutting tool for drilling a hole in the adjoining main pipe

3.3

spigot end fitting

fitting where the outside diameter of the spigot end is equal to the nominal outside diameter, d_n , of the corresponding pipe

3.4

socket fusion fitting

fitting designed to accept the insertion of a pipe or spigot end to realize a fusion joint between mating surfaces using the socket fusion process

3.5

mechanical fitting

fitting for assembling plastics pipes with each other or with a metal pipe or fitting, that includes one or more compression zones to provide pressure integrity, leak tightness and resistance to end loads

[SOURCE: ISO 17885:2021, 3.1.1]

4 Symbols and abbreviated terms

For the purposes of this document the symbols and abbreviated terms given in ISO 4437-1, ISO 4437-2 and the following apply.

A_d	percentage of decohesion (area)
c_1	outside diameter of the terminal shroud
c_2	diameter of the contact area of the terminal
c_3	internal diameter of the terminal shroud
c_4	maximum overall diameter of the base of the contact area
D	mean outside diameter of the fusion end piece
D_1	mean inside diameter in the fusion zone measured in a plane parallel to the plane of the mouth at a distance of $L_3 + 0,5L_2$ from that face
D_2	bore, i.e. the minimum diameter of the flow channel through the plastic body of the fitting
D_3	mean inside mouth diameter of the socket, i.e. the mean diameter of the circle at the intersection of the extension of the socket with the plane of the socket mouth
D_4	mean inside root diameter of the socket, i.e. the mean diameter of the circle in a plane parallel to the plane of the mouth and separated from it by a distance of L_9 which is the reference length of the socket
E	fusion face wall thickness
E_1	wall thickness (at any point) of the fitting body
h	internal depth of the terminal shroud
h_1	distance between the upper part of the terminal shroud and the contact area
h_2	height of the contact area
H	height of the saddle, i.e. the distance from the top of the main pipe to the top of the tapping tee or saddle
H_1	height of the service pipe, i.e. the distance from the top of the main pipe to the axis of the service pipe
L_1	depth of penetration of the pipe or spigot end fitting
L_2	heated length within the socket, i.e. the nominal length of the fusion zone as declared by the manufacturer
L_3	distance between the mouth of the fitting and the start of the fusion zone, i.e. the nominal unheated entrance length of the fitting as declared by the manufacturer
L_4	cut-back length of the fusion end piece
L_5	tubular length of the fusion end piece
L_6	socket length, i.e. the length from mouth to shoulder, if any
L_7	insertion depth, i.e. the depth of the heated pipe end into the socket
L_8	heated socket length, i.e. the length of penetration of the heated tool into the socket
L_9	reference socket length, i.e. the theoretical minimum socket length used for the purpose of calculation
L_{10}	heated pipe length, i.e. the depth of penetration of the pipe end into the heated tool
L_d	percentage of decohesion (length)