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

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).

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

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO’s adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is 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 4437 consists of the following parts, under the general title Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE):

— Part 1: General
— Part 2: Pipes
— Part 3: Fittings
— Part 4: Valves
— Part 5: Fitness for purpose of the system
Introduction

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

Requirements and test methods for material and components are specified in ISO 4437-1, ISO 4437-2, ISO 4437-3, and ISO 4437-4.

Recommended practice for installation is given in ISO/TS 10839.[2]

This part of ISO 4437 covers the characteristics of fitness for purpose of the system.
Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) —

Part 5:
Fitness for purpose of the system

1 Scope
This part of ISO 4437 specifies the requirements of fitness for purpose of the polyethylene (PE) piping system to be used for the supply of gaseous fuels.

It specifies the definitions of electrofusion, socket fusion, butt fusion, and mechanical joints.

It specifies the method of preparation of test piece joints and the tests to be carried out on these joints for assessing the fitness for purpose of the system under normal and extreme conditions.

It specifies the test parameters for the test methods referred to in this part of ISO 4437.

In conjunction with ISO 4437-1, ISO 4437-2, ISO 4437-3, and ISO 4437-4, it is applicable to PE pipes, fittings, valves, their joints, and joints with components of PE and other materials intended to be used under the following conditions:

a) the maximum operating pressure (MOP) is based on the design stress, determined from the compound minimum required strength (MRS) divided by the factor, and taking into account rapid crack propagation (RCP) requirements;

b) a temperature of 20 °C as reference temperature for the design basis.

NOTE 1 For other operating temperatures, derating coefficients are given in Annex A.

NOTE 2 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.

2 Normative references
The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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 1167-2, Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces

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 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 4437-5:2014(E)

ISO 10838-1), Mechanical fittings for polyethylene piping systems for the supply of gaseous fuels — Part 1:
Metal fittings for pipes of nominal outside diameter less than or equal to 63 mm
ISO 10838-2), Mechanical fittings for polyethylene piping systems for the supply of gaseous fuels — Part 2:
Metal fittings for pipes of nominal outside diameter greater than 63 mm
ISO 10838-3), Mechanical fittings for polyethylene piping systems for the supply of gaseous fuels — Part 3:
Thermoplastics fittings for pipes of nominal outside diameter less than or equal to 63 mm
ISO 11413:2008, Plastics pipes and fittings — Preparation of test piece assemblies between a polyethylene
(PE) pipe and an electrofusion fitting
ISO 11414:2009, Plastics pipes and fittings — Preparation of polyethylene (PE) pipe/pipe or pipe/fitting test
piece assemblies by butt fusion
ISO 13477, Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack
propagation (RCP) — Small-scale steady-state test (S4 test)
ISO 13478, Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack
propagation (RCP) — Full-scale test (FST)
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 21751, Plastics pipes and fittings — Decohesion test of electrofusion assemblies — Strip-bend test

3 Terms and definitions

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

3.1 mechanical joint
joint made by assembling a PE pipe with a fitting that generally includes a compression part to provide
for pressure integrity, leak tightness, and resistance to end loads

4 Fitness for purpose of the system

4.1 Method of preparation of assemblies for testing

4.1.1 General

The joints shall be made by using pipes conforming to ISO 4437-2 and fittings conforming to ISO 4437-3.
Test pieces for pressure testing shall be closed with pressure-tight, end-load-bearing end caps, plugs, or
flanges which shall be provided with connections for the entry of water and release of air.

The peelable layer of peelable-layer pipe shall be removed in the area of the joint prior to jointing.
Test assemblies should be prepared taking into consideration applicable national safety regulations.

1) These International Standards are under revision and will be replaced by ISO 17885.