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**Plastics piping systems — Multilayer  
pipe systems for indoor gas  
installations with a maximum  
operating pressure up to and  
including 5 bar (500 kPa) —**

**Part 1:  
Specifications for systems**

*Systèmes de canalisations en matières plastiques — Tubes multicouches et leurs assemblages pour une pression maximale de service inférieure ou égale à 5 bar (500 kPa) destinés à l'alimentation en gaz à l'intérieur des bâtiments —*

*Partie 1: Spécifications pour les systèmes*



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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. [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. [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 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*.

This second edition cancels and replaces the first edition (ISO 17484-1:2006), which has been technically revised. It also incorporates ISO 17484-1:2006/Cor.1:2008.

ISO 17484 consists of the following parts, under the general title *Plastics piping systems — Multilayer pipe systems for indoor gas installations with a maximum operating pressure up to and including 5 bar (500 kPa)*:

- *Part 1: Specifications for systems*
- *Part 2: Code of practice*

## Introduction

This part of ISO 17484 was developed in response to worldwide demand for minimum specification for multi-layered pipes for indoor gas applications.

Multi-layered pipes are delivered generally as a complete system. Pipes, fittings, tools, etc., are not compatible with components of another brand, generally. An advantage is that all components are perfectly geared to one another, but for repair, the lack of compatibility might be problematic in the future.

### Safety of systems

Depending on the construction of the house, pipework layout and other local circumstances, it is possible that additional safety devices are required to fulfil the demands of fire safety. Safety aspects of the system are described in ISO 17484-2 and national regulations shall be taken into account.

### Code of practice

The second part of ISO 17484 is the code of practice for installation.

Recommendations on design, construction and protection in case of fire of the gas indoor installation are given in EN 1775.

### References to ISO/TC 138/SC5 work

Test methods referred to in this part of ISO 17484 have been developed by SC 5 as far as possible. However, not all test methods needed are in the working programme of SC 5. These test methods are placed in [Annexes B](#) to [K](#) of this part of ISO 17484. It is planned that these tests will be developed as International Standards in the future.

For multilayer pipe construction, consisting of a layer of a reference standard material, an adhesive and a non-stress-designed layer, procedure I and the relevant product standards are followed for all aspects, excluding the aspects of delamination and, if applicable, oxygen permeation.

For example, layers can have the following purposes:

- ability to withstand the pressure;
- ability to realize interlayer adhesion;
- ability to block or greatly diminish incoming UV and/or sunlight;
- ability to mechanically protect the outside layer;
- ability to control the longitudinal expansion;
- ability to give the multilayer pipe a colour (inside layer or outside layer).

Some characteristics can be combined in one layer.

# Plastics piping systems — Multilayer pipe systems for indoor gas installations with a maximum operating pressure up to and including 5 bar (500 kPa) —

## Part 1: Specifications for systems

### 1 Scope

This part of ISO 17484 specifies the general requirements and the performance requirements for multilayer pipe systems based on pipes, fittings and their joints intended to be used for gas supply within buildings.

PE-X and PE pipes composed of one stress-designed layer, adhesive and a barrier layer are also covered by this part of ISO 17484.

This part of ISO 17484 gives guidance for the design of piping systems consisting of multilayer pipes based on thermoplastics, for which at least 60 % of the wall thickness is polymeric material. Polymeric materials intended for stress-designed layers and all inner layers are required to be polyethylene (PE) and/or crosslinked polyethylene (PE-X) in accordance with [Annex A](#) of this part of ISO 17484. The outer layer of a metal multilayer is required to be PE or PE-X. PE-RT is considered as PE but with specific properties concerning hoop-stress performance (see [5.4.2](#)).

NOTE The maximum operation pressure of PE 80 may be lower than 5 bar.

This part of ISO 17484 applies to systems that operate at temperatures of  $-20\text{ °C}$  up to  $+60\text{ °C}$ .

For the purpose of this part of ISO 17484, crosslinked polyethylene (PE-X) and adhesive layers are considered as thermoplastic materials.

For sizes greater than 63 mm the requirements of ISO 18225 have to be fulfilled in addition.

This part of ISO 17484 is applicable for piping systems used in buildings to supply gas with a maximum operating pressure up to and including 500 kPa (5 bar)<sup>1)</sup>.

This standard applies to the following fuels:

- Category D gaseous fuel: natural gas; see ISO 13623;
- Category E gaseous fuel: LPG vapour, and natural gas or LPG vapour; see ISO 13623.

### 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 3:1973, *Preferred numbers — Series of preferred numbers*

ISO 161-1, *Thermoplastics pipes for the conveyance of fluids — Nominal outside diameters and nominal pressures — Part 1: Metric series*

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

ISO 497:1973, *Guide to the choice of series of preferred numbers and of series containing more rounded values of preferred numbers*

ISO 1167 (all parts), *Thermoplastics pipes for the conveyance of fluids — Resistance to internal pressure — Test method*

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

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 4437-4, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 4: Valves<sup>2)</sup>*

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

ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation*

ISO 10146, *Crosslinked polyethylene (PE-X) pipes — Effect of time and temperature on the expected strength*

ISO 10838 (all parts), *Mechanical fittings for polyethylene piping systems for the supply of gaseous fuels<sup>3)</sup>*

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

ISO 13480, *Polyethylene pipes — Resistance to slow crack growth — Cone test method*

ISO 13623:2000, *Petroleum and natural gas industries — Pipeline transportation systems*

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

ISO 14531-1, *Plastics pipes and fittings — Crosslinked polyethylene (PE-X) pipe systems for the conveyance of gaseous fuels — Metric series — Specifications — Part 1: Pipes*

ISO 14531-2, *Plastics pipes and fittings — Crosslinked polyethylene (PE-X) pipe systems for the conveyance of gaseous fuels — Metric series — Specifications — Part 2: Fittings for heat-fusion jointing*

ISO 17454:2006, *Plastics piping systems — Multilayer pipes — Test method for the adhesion of the different layers using a pulling rig*

ISO 17456:2006, *Plastics piping systems — Multilayer pipes — Determination of long-term strength*

ISO 18225, *Plastics piping systems — Multilayer piping systems for outdoor gas installations — Specifications for systems*

EN 713, *Plastics piping systems — Mechanical joints between fittings and polyolefin pressure pipes — Test method for leaktightness under internal pressure of assemblies subjected to bending*

EN 1555-3, *Plastics piping systems for the supply of gaseous fuels — Polyethylene(PE) — Part 3: Fittings*

### **3 Terms, definitions and symbols**

For the purposes of this document, the following terms, definitions and symbols apply.

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2) ISO 4437-4 will be published in the near future.

3) ISO 10838 (all parts) is currently being revised and will be replaced by ISO 17885.