INTERNATIONAL STANDARD

**ISO 17484-2**

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# Plastics piping systems — Multilayer pipe systems for indoor gas installations —

## Part 2: Code of practice

*Systèmes de canalisations en matières plastiques — Tubes multicouches et leurs assemblages destinés à l'alimentation en gaz à l'intérieur des bâtiments —*

*Partie 2: Code de pratique*



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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.

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 17484-2 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 17484 consists of the following parts, under the general title *Plastics piping systems — Multilayer pipe systems for indoor gas installations*:

— *Part 1: Specifications for systems*

— *Part 2: Code of practice*



 

# Introduction

ISO 17484 applies to multilayer pipe systems intended to be installed inside buildings.

The scope of this part of ISO 17484 has been limited to a maximum operating pressure (MOP) of 5 bar (500 kPa).

Although these materials are able to withstand higher pressures, a lower maximum working pressure has been selected taking into account use for gas within buildings. Therefore, a rather high safety factor has been incorporated into the functional requirements. Currently, in some countries multilayer piping is installed only under specific conditions, but this is not the case everywhere. Generally, interest in multilayer pipe systems has been increasing. Cost-effective material installation cost is a good argument for the reconsideration of conventional installation techniques. Compared with traditional materials and installation techniques, multilayer systems offer ease of installation and are more cost-effective.

The working pressure of gas in buildings for domestic or commercial use is usually not more than 100 mbar (10 kPa). Only in very rare cases is a higher working pressure applied.

When higher pressures are applied, it is very important to take into account national regulations for the fitting of (industrial) gas installations.



It is likely that new pipe constructions or materials like multilayer pipe and PEX systems will be accepted in more countries in the coming years. At present, in the majority of countries only steel and copper pipework are permitted for gas supply within buildings, other materials being forbidden explicitly. However, it would be expected that national standards and laws will be changed in favour of the application of new installation techniques.

# Plastics piping systems — Multilayer pipe systems for indoor gas installations —

# Part 2: Code of practice

## 1 Scope

This part of ISO 17484 specifies the recommended practice for the installation of multilayer pipe systems in accordance with ISO 17484-1.

It is applicable to pipe systems used in buildings to supply gas with a maximum operating pressure (MOP) up to and including 5 bar[1)].

This part of ISO 17484 specifies common basic principles for indoor gas systems. Users of this part of ISO 17484 should be aware that more detailed national standards and/or codes of practice can exist in ISO member countries. These existing regulations, as well as new national regulations, take precedence over this part of ISO 17484. It is intended to be applied in association with these national standards and/or codes of practice setting out the above-mentioned basic principles.



## 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 17484-1, *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*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 17484-1 and the following apply.

**3.1**
**equipotential bond**
means of ensuring that metallic gas pipework and other metallic parts of the building are at the same potential

NOTE For safety reasons, this equipotential bonding is connected to earth.

1) 1 bar = 0,1 MPa = 0,1 N/mm$^2$ = $10^5$ N/m$^2$.

# 4 Design

## 4.1 Reference to installation standards

This part of ISO 17484 gives functional recommendations for the design of gas pipework within buildings. In addition to this part of ISO 17484, more detailed national standards shall be applied.

NOTE 1 Installation techniques differ from country to country. These different techniques are often based on "installation tradition", differences in the construction of buildings, differences in climatic conditions, etc. For these reasons it is difficult to produce a general standard for installation. This is also why EN 1775 gives only functional recommendations. In many cases EN 1775 offers more than one solution. Each national standards body may select the most appropriate possibility that could be described in a more detailed way in a national standard.

National restrictions relative to the MOP shall be taken into account.

NOTE 2 Additional safety devices are required by some national standards bodies, for example excess flow valves, thermal valves or overpressure valves.

## 4.2 Pipework components

The pipework components shall be appropriate for:

— the types of gases being distributed;

NOTE Particular attention should be given to the content of hydrogen sulfide, and to water content, dust content and water/hydrocarbon dew point with respect to materials, drainage of low points and filtration.

— the pipework design pressure;

— the location of the pipework;

— the pipework temperature under normal operating conditions.



# 5 Location of pipework

## 5.1 General requirements for location of pipework

The location of the pipework shall minimize the risk of damage caused by, for example mechanical impact, UV exposure, accelerated corrosion, chemical attack, extreme temperatures and lightning, or else additional safety measures shall be applied.

The route and location of pipework built within the internal structure shall be such that third party damage is minimized and that any building movement does not lead to failure.

The route of pipework in buildings should be located in ventilated spaces.

Ventilation shall be adequate to safely dilute any small gas leak taking due account of the density of the gas (heavier than air, e.g. LPG, or lighter than air, e.g. natural gas).

Where it is not possible to achieve adequate ventilation, other solutions shall be applied, e.g. ventilated sleeves, ducts, pipes or the filling of the space around the pipe with inert materials, etc.

The route of the pipework shall be as short as practicable and the number of joints kept to a minimum.

The use of diagonal routes should always be avoided.

Where pipework is concealed, particular attention shall be given to the mode of construction and to corrosion protection of the pipework.

The position of the pipework in relation to other services shall be such that it can function properly and be used with safety.

Pipework shall not be located near high voltage conductors or hot or chilled water systems, nor shall it be subjected to vibrations unless appropriate precautions are taken.

NOTE Spaces reserved for other uses, such as lift shafts, garbage chutes, transformers, sewage pipes and bomb shelters, should be avoided unless specific precautions are taken.

Where temperature change and building movements can lead to significant stresses on pipework, adequate provisions shall be made for moving the pipework.

The effects of lightning shall be taken into consideration when designing the pipework.

Where the distributed gas is wet or has a low vapour pressure, pipework shall be protected against frost and/or condensation and siphons shall be fitted at low points.

### 5.2 Protection in case of fire

The designer shall consider the possibility of an outbreak of fire at a building where gas pipework is in use, causing damage to the fabric of the building and, consequently or separately, to the gas pipework.

The design objective shall be to minimize the likelihood of an explosion or serious aggravation of the fire.

The design objective may be achieved, for example, by the use of one or more of the following:



— accessible manual means of isolation;

— automatic means of isolation;

— location of all or part of the pipework in an enclosure providing protection in the event of fire;



— coating pipework with a protective material to enable the pipework to withstand high temperatures for a given period of time.

NOTE In the event of fire, even if rupture does not occur, the pipework shall be carefully inspected and tested.

### 5.3 Additional safety devices

Where required by risk assessment, specific additional protection shall be installed to protect against the consequence of failure of a component of the pipework.

NOTE This may be a safety device (for example, one that protects against excessive temperatures or excess flow) or a passive protection measure (e.g. enclosure of the pipework).

The number, location and sizing of excess flow device(s) shall be assessed and should be optimized during design to allow such a device to actuate when a failure of a pipework component occurs and to cope with the locally allowed pressure drop values. This process shall rely on accurate pressure drop values given by system/component manufacturers, e.g. in design specification recommendations.

## 6 Materials and components

The MOP for multilayer pipe gas systems is 5 bar (500 kPa). The system shall meet the requirements of ISO 17484-1.

PE-X systems are suitable for the whole temperature range specified in ISO 17484-1, i.e. −20 °C to +60 °C.

The manufacturer shall be consulted with respect to prolonged operation at temperatures above 40 °C and up to 60 °C, and below 0 °C.