
**Plastics piping systems —
Polyethylene (PE) pipes for irrigation
— Specifications**

*Systèmes de canalisations en plastique — Tubes en polyéthylène (PE)
pour l'irrigation — Spécifications*



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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 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 2, *Plastics pipes and fittings for water supplies*.

This fourth edition cancels and replaces the third edition (ISO 8779:2010), which has been technically revised.

The main changes compared to the previous edition are as follows:

- The scope of this fourth edition has been modified to cover larger sizes of mains and sub-mains of irrigation piping system.

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 aim of this document is to specify the minimum requirements from polyethylene irrigation pipes that stay idle most of their life and are only pressurized for short periods from time to time. This condition is true for the majority of irrigation pipes in use, including laterals, sub-mains and even mains.

The normal conditions of use of irrigation pipes, as well as other important factors, differ widely from those of pipes used for long-term water distribution systems (according to the ISO 4427 series):

- Pressure regime: pressure is applied intermittently for short periods, adding up to maximum 15 % of any long period of time.
- Installation location: most pipes are laid above ground in fields, exposed to chemicals, soil cultivation operations, being stepped on, being run over by tractors, etc.
- Non-permanent connections: pipes are connected by removable and re-installable mechanical compression fittings, not by permanent fusion techniques.
- Movability: pipelines may be moved (manually or towed) between several locations in the field; they may also be disassembled at season's end and reassembled at the beginning of next season.
- End of life is mostly caused by external effects, mechanical or environmental, and not by failure under pressure.
- Lifetime expectancy is, consequently, much shorter: ten years maximum.
- Colours: pipes may be produced in non-black colours (e.g. violet, for irrigation by reclaimed water).
- Lower risk: a failure in an irrigation pipe has much lower impact, compared to a failure in long-term water distribution pipes.

Considering all factors above, the classification of pipe material in this document is by resistance to a standard series of pressure tests, rather than according to ISO 12162 (which relates to pipes under continuous pressure for 50 years), and material designation is therefore different. As explained above, fusion compatibility is not required either. Otherwise, this document follows ISO 4427-2 with regards to dimensions and test requirements.

In order to clearly restrict the use of this document to those pipes that fit the description above, the Scope specifies a usage limit of a maximum of 1 500 hours under pressure per year. For applications where pipes exceed or may exceed this limit, pipes complying with the ISO 4427 series should be selected.

Plastics piping systems — Polyethylene (PE) pipes for irrigation — Specifications

1 Scope

This document specifies the characteristics of pipes (mains, sub-mains and laterals) made from polyethylene (PE), intended for the conveyance of water for irrigation, at a water temperature up to 45 °C.

NOTE 1 For the effect of water temperature on the maximum operating pressure, see [Annex A](#).

This document applies to pipes that will not be subjected to internal pressure for long periods, and not more than 1 500 hours/year. For piping applications with long-term continuous pressure, the ISO 4427 series applies.

NOTE 2 The expected lifetime of pipes covered by this document is ten years or less.

This document also specifies the properties of the material and the parameters for the test methods to which it refers.

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 1167-2, *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 2505, *Thermoplastics pipes — Longitudinal reversion — Test method and parameters*

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

ISO 6964, *Polyolefin pipes and fittings — Determination of carbon black content by calcination and pyrolysis — Test method*

ISO 8796, *Polyethylene PE 32 and PE 40 pipes for irrigation laterals — Susceptibility to environmental stress cracking induced by insert-type fittings — Test method and requirements*

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

ISO 11922-1, *Thermoplastics pipes for the conveyance of fluids — Dimensions and tolerances — Part 1: Metric series*

ISO 18553, *Method for the assessment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds*

3 Terms and definitions

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