International Standard

ISO 11301-1

First edition
2026-07

Piping systems for rehabilitation of underground gas supply networks —

Part 1: Polyethylene (PE) material

Systèmes de canalisations pour la réhabilitation des réseaux de distribution de gaz enterrés —

Partie 1: Matériau Polyéthylène (PE)

Reference number
ISO 11301-1:2026(en)

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

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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 8, *Rehabilitation of pipeline systems*,in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 155, *Plastics piping systems and ducting systems,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 11301-1 cancels and replaces ISO 11299-1:2018, ISO 11299-2:2018, ISO 11299-3:2018, ISO 21225-1:2018 and ISO 21225-2:2018, which have been technically revised.

The main changes are as follows:

— for piping systems made from polyethylene (PE) material, this document replaces the related content, including requirements, of the documents listed above.

A list of all parts in the ISO 11301 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.

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Introduction

This document is a part of a series of International Standards for piping systems of various materials used for the rehabilitation of existing pipelines in a specified application area. Standards for rehabilitation deal with the following applications:

— the ISO 11300 series: *Piping systems for rehabilitation of underground drains, sewers and water supply networks*;

— the ISO 11301 series: *Piping systems for rehabilitation of underground gas supply networks*.

The ISO 11300 series and the ISO 11301 series are subdivided into parts covering a specific material per pipe system.

The ISO 11300 series is subdivided into four parts:

— *Part 1: Polyethylene (PE) material;*

— *Part 2: Thermoset composite materials*;

— *Part 3: Polyvinyl chloride (PVC-U) material;*

— *Part 4: Thermoplastic composite materials*.

The ISO 11301 series currently consists of two parts:

— *Part 1: Polyethylene (PE) material* (this document);

— *Part 5: Unplasticized Polyamide (PA-U) material.*[1)]

These series of standards cover various techniques for renovation and trenchless replacement. Furthermore, they are distinguished from those for conventionally installed plastics piping systems by the requirement to verify certain characteristics in the "as-installed" condition, after site processing. This is in addition to specifying requirements for piping system components "as manufactured".

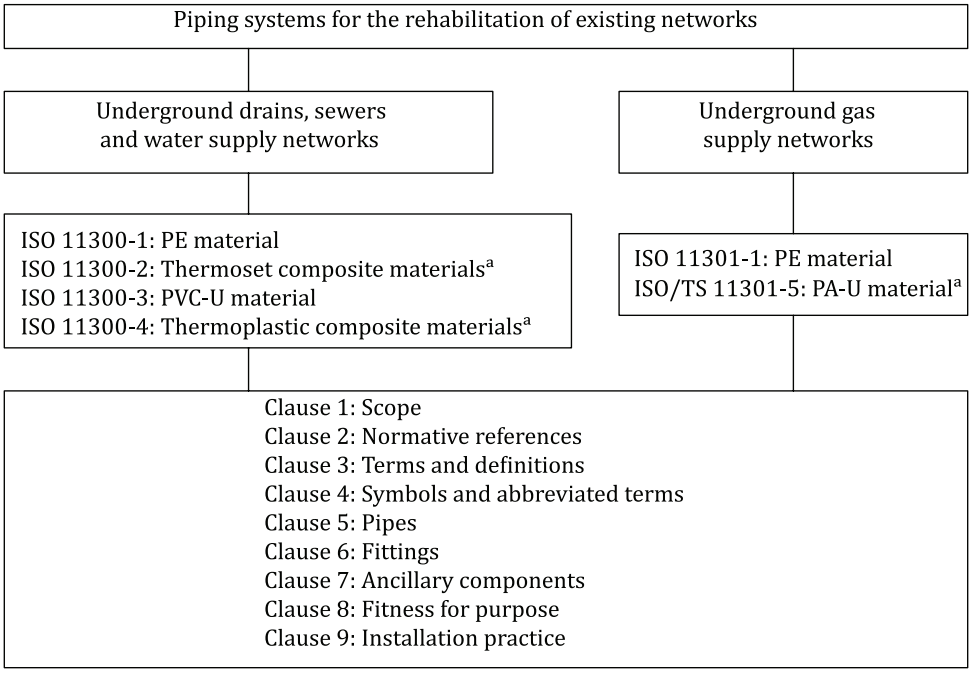
A consistent structure of clause headings has been adopted for all parts of the ISO 11300 series and the ISO 11301 series, in order to facilitate direct comparisons across renovation technique families.

Figure 1 shows the clause structure and the relationship between the ISO 11300 series and the ISO 11301 series.

For complementary information, see ISO 11295.

1) Under preparation. Stage at the time of publication: ISO/AWI TS 11301-5:2026.

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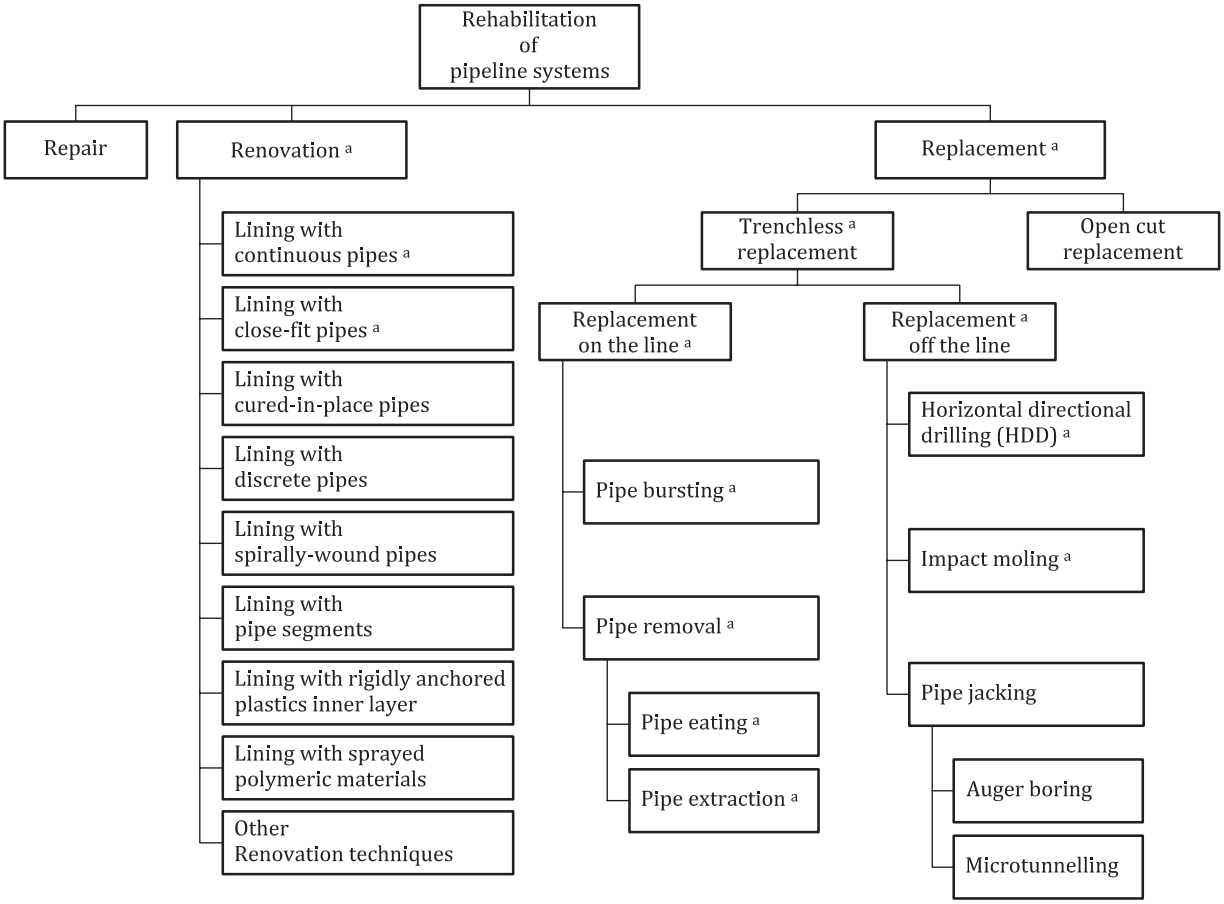


[a] Under preparation

Figure 1 — Clause structure of the ISO 11300 series and the ISO 11301 series

The various techniques for rehabilitation of underground gas supply networks, within the scope of pipeline rehabilitation techniques generally, are shown schematically in Figure 2. For definitions of standardized renovation techniques shown in Figure 2, but outside the scope of this document, see ISO 11295.

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a This document is applicable for pipe systems made from PE materials.

Figure 2 — Technique families for rehabilitation of underground gas supply networks using plastics pipes, within the scope of pipeline rehabilitation techniques

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Piping systems for rehabilitation of underground gas supply networks —

Part 1: Polyethylene (PE) material

1 Scope

This document specifies requirements and test methods for pipes and fittings which are part of piping systems for the rehabilitation, by means of renovation and trenchless replacement, of underground gas supply networks.

It is applicable to polyethylene (PE) pipes, fittings and assemblies, as manufactured and as installed. It is not applicable to the existing pipeline.

This document is applicable to the following technique families for renovation, intended to be used at an operating temperature of 20 °C as a reference temperature:

— lining with continuous pipes;

— lining with close-fit pipes.

This document is applicable to the following technique families for trenchless replacement, intended to be used at an operating temperature of 20 °C as a reference temperature:

— pipe bursting and pipe extraction;

— horizontal directional drilling and impact moling.

This document is applicable to:

— PE solid wall single layered pipes (nominal outside diameter, d_n), including any identification stripes;

— PE pipes with co-extruded layers on either or both the outside and inside of the pipe (total outside diameter, d_n), as specified in Annex D, where all layers have the same minimum required strength (MRS) rating.

Furthermore, when used with lining with continuous pipes and trenchless replacement, this document is applicable to:

— PE coated pipes (outside diameter, d_n) having a peelable, contiguous, thermoplastics additional layer on the outside of the pipe ("coated pipe"), as specified in Annex D.

NOTE When used with lining with close-fit lining pipes, the lining pipe is reduced in the factory or on site to provide a close-fitting independent or interactive pressure pipe liner.

This document is applicable to jointing by means of butt fusion and electrofusion and to fabricated and injection-moulded fittings and mechanical connections of PE.

This document is not applicable to push-fit jointed discrete pipes assembled as part of the trenchless installation process.

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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 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*

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

ISO 12176-1, *Plastics pipes and fittings — Equipment for fusion jointing polyethylene systems — Part 1: Butt fusion*

ISO 12176-2, *Plastics pipes and fittings — Equipment for fusion jointing polyethylene systems — Part 2: Electrofusion*

ISO 16010, *Elastomeric seals — Material requirements for seals used in pipes and fittings carrying gaseous fuels and hydrocarbon fluids*

EN 682, *Elastomeric seals — Material requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids*

EN 1555-1, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 1: General*

EN 1555-2, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 2: Pipes*

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

EN 1555-4, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 4: Valves*

EN 1555-5, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 5: Fitness for purpose of the system*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 General

3.1.1
pipeline system
interconnecting pipe network for the conveyance of fluids

3.1.2
rehabilitation
measures for restoring or upgrading the performance of existing *pipeline systems* (3.1.1), including *renovation* (3.1.3), *repair* (3.1.4) and *replacement* (3.1.5)

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