



**International
Standard**

ISO 11301-1

**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)

**First edition
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Sample Document

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Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	2
3 Terms and definitions	2
3.1 General	2
3.2 Terms related to techniques	5
3.3 Terms related to characteristics	6
3.4 Terms related to product stages	8
3.5 Terms related to materials	8
3.6 Terms related to service conditions	9
3.7 Terms related to joints	9
4 Symbols and abbreviated terms	10
4.1 Symbols	10
4.2 Abbreviated terms	11
5 Pipes	11
5.1 Materials	11
5.2 General characteristics	11
5.3 Material characteristics	12
5.4 Geometric characteristics	12
5.5 Mechanical characteristics	12
5.6 Physical characteristics	12
5.7 Jointing	12
5.8 Marking	13
5.9 Regional requirements for pipes	13
6 Fittings	13
6.1 Materials	13
6.2 Marking	13
6.3 Regional requirements for fittings	14
7 Ancillary components	14
7.1 Requirements	14
7.2 Regional requirements for ancillary components	14
8 Fitness for purpose	14
8.1 Materials	14
8.2 General characteristics	14
8.3 Geometric characteristics	15
8.4 Mechanical characteristics	15
8.5 Sampling	15
8.6 Regional requirements for fitness for purpose	16
9 Installation practice	16
9.1 Preparatory work	16
9.2 Storage, handling and transport of pipes and fittings	16
9.3 Equipment	16
9.3.1 General	16
9.3.2 Butt fusion equipment and de-beading equipment	17
9.3.3 Pipe skids/rollers	17
9.3.4 Winching and rod-pulling equipment	17
9.3.5 Pipe entry guides	17
9.3.6 Electrofusion equipment	17
9.3.7 Inspection equipment	18
9.3.8 Lifting equipment	18

9.4	Installation.....	18
9.4.1	General.....	18
9.4.2	Safety precautions.....	19
9.4.3	Simulated installations.....	19
9.5	Process-related inspection and testing.....	20
9.6	Pipe end termination.....	20
9.7	Reconnection to the existing pipeline system.....	20
9.8	Final inspection and testing.....	20
9.9	Documentation.....	20
Annex A	(normative) Specific requirements applicable for lining with continuous pipes.....	21
Annex B	(normative) Specific requirements applicable for lining with close-fit pipes.....	22
Annex C	(normative) Specific requirements for trenchless replacement techniques — Pipe bursting, pipe extraction, HDD and impact moling.....	26
Annex D	(normative) Layered pipes.....	31
Annex E	(normative) Factory-folded heat-reverted polyethylene (PE) pipe — Determination of memory ability.....	32
Annex F	(informative) Pipe design considerations particular to pipe bursting and pipe extraction.....	34
Annex G	(informative) Pipe design considerations particular to HDD.....	36
Annex H	(informative) Summary of required elements to be included in installation manuals.....	38
Bibliography		39

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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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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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.

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”.

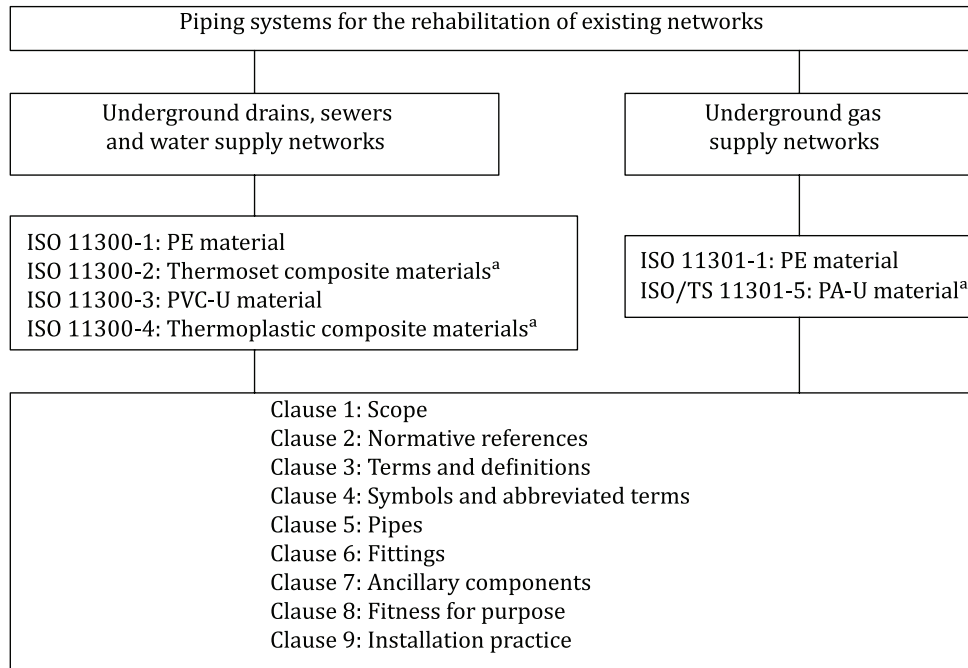
A consistent structure of clause headings has been adopted for all parts of the ISO 11300 series and the ISO 11301 series, in order to facilitate direct comparisons across renovation technique families.

[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.

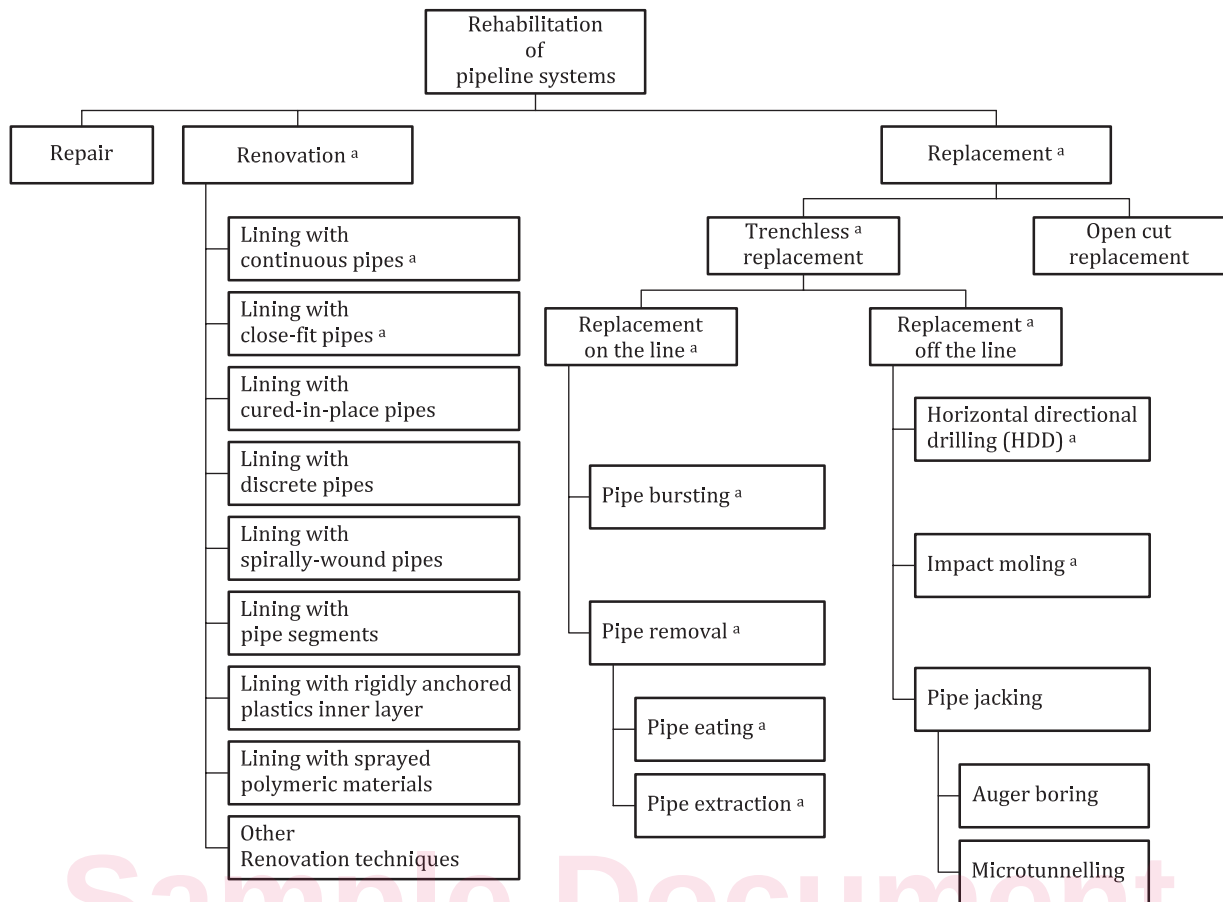
ISO 11301-1:2026(en)



^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.



^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

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.

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)

3.1.3

renovation

work incorporating all or part of the original fabric of the pipeline, by means of which its current performance is improved

3.1.4

repair

rectification of local damage

3.1.5

replacement

construction of a new pipeline, on or off the line of an existing pipeline, where the function of the new *pipeline system* (3.1.1) incorporates that of the old

3.1.6

trenchless replacement

replacement (3.1.5) without opening trenches other than small excavations to provide access for the particular technique and for service and lateral connections

3.1.7

maintenance

routine work undertaken to ensure the existing performance of an asset

3.1.8

rehabilitation pipe

polyethylene (PE) pipe applied for *renovation* (3.1.3) or *trenchless replacement* (3.1.6) purposes

3.1.9

lining pipe

pipe for *renovation* (3.1.3) purposes prior to any site processing

3.1.10

liner

lining pipe (3.1.9) after installation

3.1.11

lining system

lining pipe (3.1.9) and all relevant fittings for insertion into an existing pipeline for the purposes of *renovation* (3.1.3)

3.1.12

replacement pipe

new pipe installed for *rehabilitation* (3.1.2) purposes

3.1.13

installation manual

document that provides the information necessary to install a system or component and prepare the system or component for operational use

[SOURCE: ISO/IEC/IEEE 24765:2017, 3.2006, modified — "set initial parameters" and "cf. diagnostic manual, operator manual, programmer manual, support manual, user manual" have been removed from the definition.]

3.1.14

rehabilitation system supplier

entity that specifies the field and range of application and brings together the components of a *rehabilitation* (3.1.2) system to meet the requirements of the product standard at the "M" stage (3.4.1), so that when installed in accordance with the *installation manual* (3.1.13) they meet the requirements of the product standard at the "I" stage (3.4.2)

3.1.15

system installer

entity that prepares the host pipe, takes the *rehabilitation* (3.1.2) system at the “M” stage (3.4.1) and installs it so that it is at the “I” stage (3.4.2)

3.1.16

characteristic

property, dimension or other feature of a material or component

3.1.17

grouting

process of filling voids around the *lining system* (3.1.11)

3.1.18

system test pressure

STP

hydrostatic and/or air pressure applied to the installed *pipeline system* (3.1.1), in order to ensure its integrity and leaktightness

3.1.19

simulated installation

installation of a *lining system* (3.1.11) into a *simulated host pipeline* (3.1.20), using representative equipment and processes, to provide samples for testing which are representative of an actual installation

3.1.20

simulated host pipeline

section of pipeline, which is not part of an operational network, but which replicates the environment of an operational network

3.1.21

technique family

group of *rehabilitation* (3.1.2) techniques which are considered to have common *characteristics* (3.1.16) for standardization purposes

3.1.22

coated pipe

pipe with a peelable, contiguous thermoplastic additional layer on the outside of the pipe

3.1.23

solid wall single layered pipe

pipe with smooth internal and external surface, extruded from the same compound/formulation throughout the wall

3.1.24

pipe with co-extruded layer

pipe with smooth internal and external surface, having co-extruded layers on either or both the outside and inside of the pipe, where all layers have the same *minimum required strength(MRS)* (3.3.16) rating

3.1.25

interactive pressure pipe liner

liner (3.1.10) which relies on the existing pipeline for some measure of radial support in order to resist without failure all applicable internal loads throughout its design life

3.1.26

type testing

testing performed to prove that a material, component, joint or assembly is capable of conforming to the requirements given in the applicable standard