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Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks —

Part 2: Lining with continuous pipes

Systèmes de canalisations en plastique pour la rénovation des réseaux de branchements et de collecteurs d'assainissement enterrés sans pression —

Partie 2: Tubage par tuyau continu avec espace annulaire

Reference number
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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).

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For an explanation on 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 the following URL: 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*.

A list of all parts in the ISO 11296 series can be found on the ISO website.

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Introduction

This document is part of a system standard for plastics piping systems of various materials used for renovation of existing pipelines in a specified application area. System standards for renovation dealing with the following applications are either available or in preparation:

— ISO 11296, *Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks (this application);*

— ISO 11297, *Plastics piping systems for renovation of underground drainage and sewerage networks under pressure;*

— ISO 11298, *Plastics piping systems for renovation of underground water supply networks;*

— ISO 11299, *Plastics piping systems for renovation of underground gas supply networks.*

These system standards are distinguished from system standards 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 verification of characteristics of plastics piping systems "as manufactured".

Each of the system standards comprises a:

— *Part 1: General*

and all applicable renovation technique family-related parts, which for non-pressure drainage and sewerage networks include or potentially include the following:

— *Part 2: Lining with continuous pipes (this document)*

— *Part 3: Lining with close-fit pipes*

— *Part 4: Lining with cured-in-place pipes*

— *Part 5: Lining with discrete pipes*

— *Part 7: Lining with spirally-wound pipes*

— *Part 8: Lining with pipe segments*

— *Part 9: Lining with rigidly anchored plastics inner layer*

— *Part 10: Lining with sprayed polymeric materials*

The requirements for any given renovation technique family are specified in ISO 11296-1, applied in conjunction with the relevant other part. For example, both ISO 11296-1 and this document together specify the requirements relating to lining with continuous pipes. For complementary information, see ISO 11295. Not all technique families are pertinent to every area of application and this is reflected in the part numbers included in each System Standard.

A consistent structure of clause headings has been adopted for all parts to facilitate direct comparisons across renovation technique families.

Figure 1 shows the common part and clause structure and the relationship between ISO 11296 and system standards for other applications.

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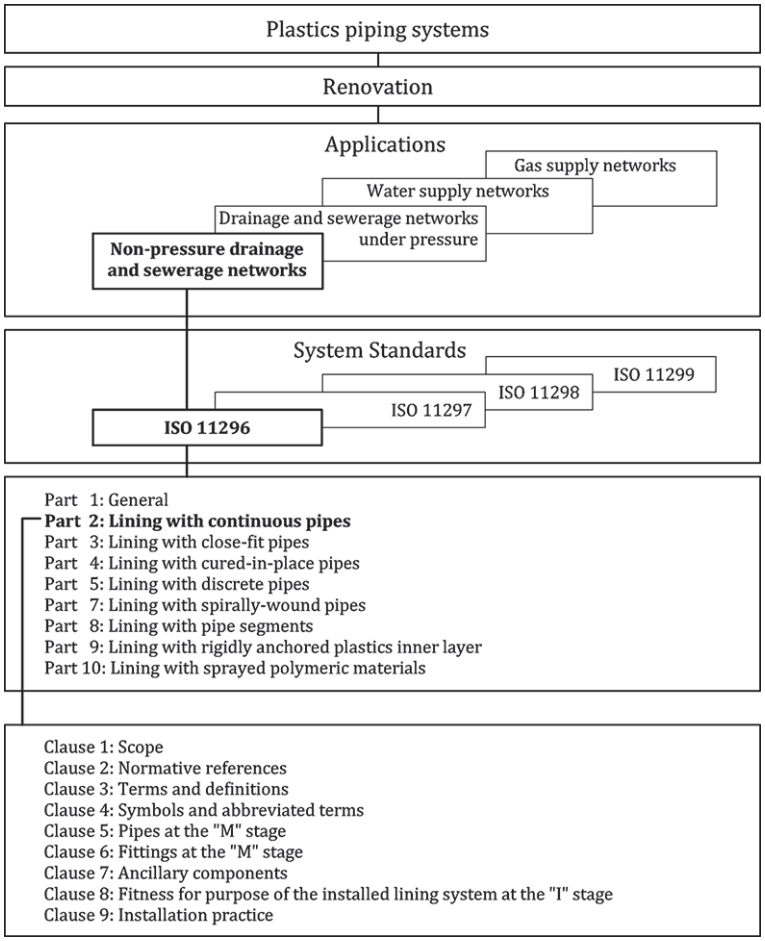


Figure 1 — Format of the renovation system standards

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Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks —

Part 2: Lining with continuous pipes

1 Scope

This document, in conjunction with ISO 11296-1, specifies requirements and test methods for pipes and fittings which are part of plastics piping systems installed as continuous pipes in the renovation of underground non-pressure drainage and sewerage networks. It is applicable to polyethylene (PE) pipes of three different types:

— 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 A, where all layers have the same MRS rating;

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

In addition it covers:

— jointing of pipe lengths by means of butt fusion;

— fabricated and injection-moulded fittings made of PE.

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 8772, *Plastics piping systems for non-pressure underground drainage and sewerage — Polyethylene (PE)*

ISO 11296-1:2018, *Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks — Part 1: General*

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*

EN 12666-1, *Plastics piping systems for non-pressure underground drainage and sewerage — Polyethylene (PE) — Part 1: Specifications for pipes, fittings and the system*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11296-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

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— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
compound formulation
clearly defined homogenous mixture of base polymer with additives e.g. anti-oxidants, pigments, stabilisers and others, at a dosage level necessary for the processing and intended use of the final product

3.2
coated pipe
pipe with a peelable, contiguous thermoplastic additional layer on the outside of the pipe

3.3
solid wall single layered pipe
pipe with smooth internal and external surface, extruded from the same compound/formulation throughout the wall

3.4
pipe with co-extruded layers
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 MRS rating

3.5
out-of-roundness
difference between the measured maximum and the measured minimum outside diameter in the same cross-sectional plane of the pipe

4 Symbols and abbreviated terms

4.1 Symbols

d_n nominal outside diameter

$e_{coating}$ nominal thickness of the coating

4.2 Abbreviated terms

MFR melt mass-flow rate

CCTV closed-circuit television

MRS minimum required strength

OIT oxidation induction time

PE polyethylene

5 Pipes at the “M” stage

5.1 Material

Pipes shall be of PE conforming to the requirements of ISO 8772.

5.2 General characteristics

General characteristics of pipes shall conform to the requirements of ISO 8772.

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