INTERNATIONAL STANDARD

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Second edition
2019-01

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

Part 7: Lining with spirally-wound pipes

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

Partie 7: Tubage par enroulement hélicoïdal

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).

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 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*.

This second edition cancels and replaces the first edition (ISO 11296-7:2011), which has been technically revised. The following clause(s) have been revised:

— In 5.1, thermoplastics has been added as a separate seam sealant material category;

— In 5.3, the thickness range has been removed;

— In Table 2 the requirement for Modulus of Elasticity has been lowered to reflect current state of the art;

— In Clause 6, ISO 10467 replaces EN 14364 as normative reference for GRP saddles;

— In 8.5, Table 6, ISO 13262 replaces EN 1979 for tensile testing of a locked seam.

A list of all parts in the ISO 11296 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 System Standard for plastics piping systems of various materials used for the renovation of existing pipelines in a specified application area. System Standards for renovation deal with the following applications:

— 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 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 plastics piping system components "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*;

— *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* (this document);

— *Part 8: Lining with pipe segments*;

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

— *Part 10: Lining with sprayed polymeric materials*.

The requirements for any given renovation technique family are specified in Part 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 spirally-wound 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 of ISO 11296, in order to facilitate direct comparisons across renovation technique families.

Figure 1 shows the common part and clause structure and the relationship between ISO 11296 and the System Standards for other application areas.

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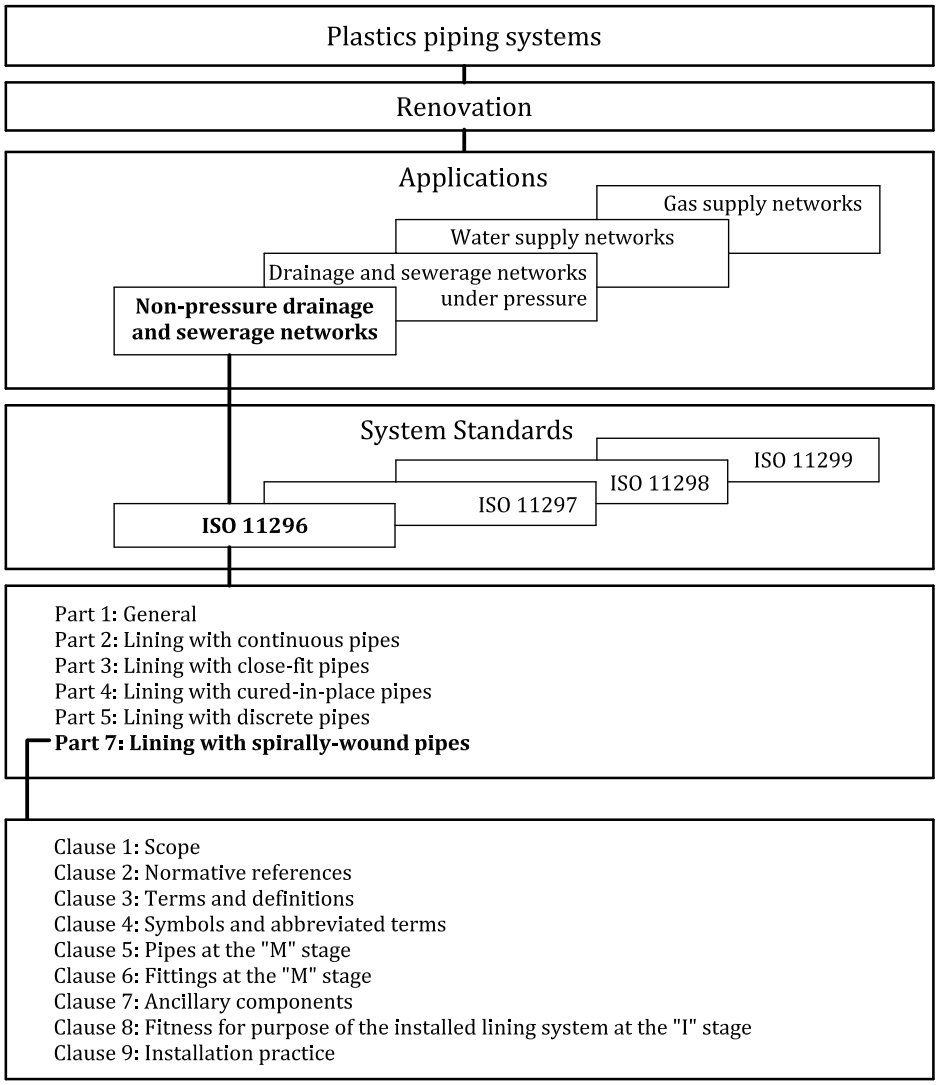


Figure 1 — Format of the renovation System Standards

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

Part 7: Lining with spirally-wound pipes

1 Scope

This document, in conjunction with ISO 11296-1, specifies requirements and test methods for pipes which are formed on site by spirally winding and jointing a pre-manufactured profiled plastics strip, or a profiled plastics strip and integral locking joiner strip, and used for the renovation of underground non-pressure drainage and sewerage networks.

It applies to spirally-wound pipes of fixed or variable diameter made of profiled plastics strips, with or without steel stiffening elements, and installed by one of two methods.

The first method employs a dedicated winding machine in front of the open end of an existing pipeline, e.g. in a manhole. The pipes thus formed are simultaneously inserted into the existing pipeline by the winding forces, and by certain techniques can also be expanded in diameter after or during insertion.

The second method employs a dedicated winding machine which forms the pipe as it traverses the existing pipeline from one manhole to the next.

It applies to profiled plastics strips of unplasticized poly(vinyl chloride) (PVC U) with integral locking mechanism, or of high density polyethylene (HDPE) with integrally welded joints.

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 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 179-1, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test*

ISO 306, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*

ISO 527-1, *Plastics — Determination of tensile properties — Part 1: General principles*

ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

ISO 4427-3, *Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 3: Fittings*

ISO 4435, *Plastics piping systems for non-pressure underground drainage and sewerage — Unplasticized poly(vinyl chloride) (PVC-U)*

ISO 4948-2, *Steels — Classification — Part 2: Classification of unalloyed and alloy steels according to main quality classes and main property or application characteristics*

ISO 6259-1, *Thermoplastics pipes — Determination of tensile properties — Part 1: General test method*

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ISO 7619-1, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 1: Durometer method (Shore hardness)*

ISO 9967, *Thermoplastics pipes — Determination of creep ratio*

ISO 9969, *Thermoplastics pipes — Determination of ring stiffness*

ISO 10467:2018, *Plastics piping systems for pressure and non-pressure drainage and sewerage — Glass-reinforced thermosetting plastics (GRP) systems based on unsaturated polyester (UP) resin*

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

ISO 11296-4:2018, *Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks — Part 4: Lining with cured-in-place pipes*

ISO 13262, *Thermoplastics piping systems for non-pressure underground drainage and sewerage — Thermoplastics spirally-formed structured-wall pipes — Determination of the tensile strength of a seam*

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/

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

3.1
spirally-wound pipe
pipe formed by continuously winding and joining a profiled plastics strip, or a profiled plastics strip and integral locking joiner strip

3.2
seam
joint between adjacent profiled plastics strips formed by an integral locking mechanism and/or seam sealant

3.3
integral locking mechanism
mechanical interlock achieved by suitable design of the edges of the extruded profile

3.4
seam sealant
thermoplastic or adhesive material added to the integral locking mechanism or profiled plastics strip surface to make the seam leaktight

3.5
close fit
situation of the outside of the installed liner relative to the inside of the existing pipeline, which can either be an interference fit or include a small annular gap resulting from shrinkage and tolerances only

Note 1 to entry: Tolerances in the above definition refer to offsets and deformities in the existing pipeline. Spirally-wound liners are not subject to shrinkage.

3.6
close-fit spirally-wound pipe
continuous lining pipe wound from a profiled plastics strip, with or without steel reinforcement, expanded or wound in place to achieve a close fit to the existing pipeline

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