

Plastics piping systems for renovation of underground non-pressure drainage and sewerage networks - Part 3: Lining with close-fit pipes (ISO 11296-3:2018)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 11296-3:2018 sisaldab Euroopa standardi EN ISO 11296-3:2018 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 11296-3:2018 consists of the English text of the European standard EN ISO 11296-3:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 29.08.2018.	Date of Availability of the European standard is 29.08.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 23.040.20, 23.040.45, 91.140.80, 93.030

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:

Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

EUROPEAN STANDARD

EN ISO 11296-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2018

ICS 23.040.20; 23.040.45; 91.140.80; 93.030

Supersedes EN ISO 11296-3:2011

English Version

**Plastics piping systems for renovation of underground
non-pressure drainage and sewerage networks - Part 3:
Lining with close-fit pipes (ISO 11296-3:2018)**

Systèmes de canalisations en plastique pour la
rénovation des réseaux de branchements et de
collecteurs d'assainissement enterrés sans pression -
Partie 3: Tubage par tuyau continu sans espace
annulaire (ISO 11296-3:2018)

Kunststoff-Rohrleitungssysteme für die Renovierung
von erdverlegten drucklosen Entwässerungsnetzen
(Freispiegelleitungen) - Teil 3: Close-Fit-Lining (ISO
11296-3:2018)

This European Standard was approved by CEN on 5 August 2018.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 11296-3:2018) has been prepared by Technical Committee ISO/TC 138 "Plastics pipes, fittings and valves for the transport of fluids" in collaboration with Technical Committee CEN/TC 155 "Plastics piping systems and ducting systems" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2019, and conflicting national standards shall be withdrawn at the latest by February 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 11296-3:2011.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 11296-3:2018 has been approved by CEN as EN ISO 11296-3:2018 without any modification.

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
3.1 General.....	2
3.2 Techniques.....	2
3.3 Characteristics.....	2
3.4 Materials.....	2
3.5 Product stages.....	2
3.6 Service conditions.....	2
3.7 Joints.....	3
4 Symbols and abbreviated terms	3
5 Pipes at the “M” stage	3
5.1 Materials.....	3
5.1.1 General.....	3
5.1.2 Distinction between PVC-U types.....	3
5.1.3 Virgin material.....	3
5.1.4 Reprocessable material and recyclable material.....	3
5.2 General characteristics.....	4
5.2.1 Appearance.....	4
5.2.2 Colour.....	4
5.3 Material characteristics.....	4
5.4 Geometric characteristics.....	5
5.5 Mechanical characteristics.....	5
5.6 Physical characteristics.....	5
5.7 Jointing.....	5
5.8 Marking.....	6
6 Fittings at the “M” stage	6
7 Ancillary components	6
8 Fitness for purpose of the installed lining system at the “I” stage	6
8.1 Materials.....	6
8.2 General characteristics.....	6
8.3 Material characteristics.....	6
8.4 Geometric characteristics.....	6
8.5 Mechanical characteristics.....	8
8.6 Physical characteristics.....	9
8.7 Additional characteristics.....	9
8.8 Sampling.....	9
9 Installation practice	9
9.1 Preparatory work.....	9
9.2 Storage, handling and transport of pipes and fittings.....	9
9.3 Equipment.....	9
9.3.1 Butt fusion equipment and debanding equipment.....	9
9.3.2 Reduction equipment.....	10
9.3.3 Pipe skids/rollers.....	10
9.3.4 Winching and rod-pulling equipment.....	10
9.3.5 Pipe entry guides.....	10
9.3.6 Reforming equipment.....	10
9.3.7 Electrofusion equipment.....	10
9.3.8 Inspection equipment.....	11

9.3.9	Lifting equipment.....	11
9.4	Installation.....	11
9.5	Process-related inspection and testing.....	12
9.6	Lining termination.....	12
9.7	Reconnection to existing manholes and laterals.....	12
9.8	Documentation.....	12
9.9	Final inspection and testing.....	12
Annex A (normative) Factory-folded heat-reverted polyethylene (PE) pipe — Determination of memory ability.....		13
Bibliography.....		15

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 11296-3:2009) which has been technically revised. It also incorporates the Corrigendum ISO 11296-3:2009/Cor 1:2011.

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

- [Clauses 3, 5, 6, 8](#) and [9](#) have been technically revised;
- the previous Annex B has been deleted.

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

Introduction

This document is a 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 series);
- 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*
- *Part 3: Lining with close-fit pipes* (this document)
- *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 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 close-fit 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.

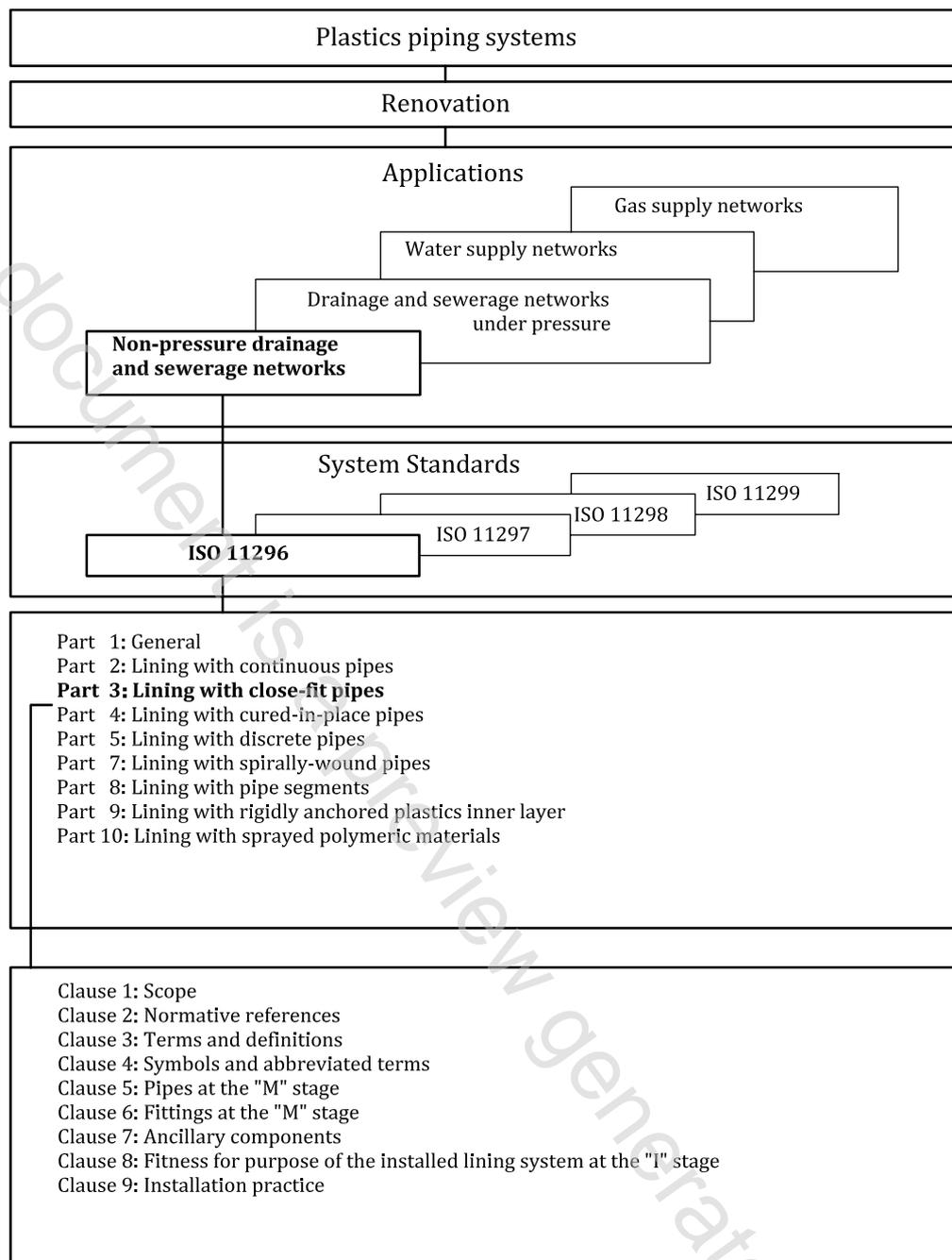


Figure 1 — Format of the renovation system standards

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

Part 3: Lining with close-fit pipes

1 Scope

This document, in conjunction with ISO 11296-1, specifies requirements and test methods for close-fit lining systems used for the renovation of underground non-pressure drainage and sewerage networks.

It applies to pipes and fittings made of polyethylene (PE) or unplasticized poly(vinyl chloride) (PVC-U) as manufactured, as well to the installed lining system with its associated 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 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

ISO 2507-1, *Thermoplastics pipes and fittings — Vicat softening temperature — Part 1: General test method*

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

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

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

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

ISO 9852, *Unplasticized poly(vinyl chloride) (PVC-U) pipes — Dichloromethane resistance at specified temperature (DCMT) — Test method*

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

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

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 1: Electrofusion*

ISO 13953, *Polyethylene (PE) pipes and fittings — Determination of the tensile strength and failure mode of test pieces from a butt-fused joint*

ISO 18373-1:2007, *Rigid PVC pipes — Differential scanning calorimetry (DSC) method — Part 1: Measurement of the processing temperature*