

Plastics piping systems for the supply of gaseous fuels -  
Unplasticized polyamide (PA-U) piping systems with  
fusion jointing and mechanical jointing - Part 2: Pipes  
(ISO 16486-2:2020)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 16486-2:2020 sisaldab Euroopa standardi EN ISO 16486-2:2020 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 16486-2:2020 consists of the English text of the European standard EN ISO 16486-2:2020.
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 14.10.2020.	Date of Availability of the European standard is 14.10.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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English Version

Plastics piping systems for the supply of gaseous fuels -  
Unplasticized polyamide (PA-U) piping systems with  
fusion jointing and mechanical jointing - Part 2: Pipes (ISO  
16486-2:2020)

Systèmes de canalisations en matières plastiques pour  
la distribution de combustibles gazeux - Systèmes de  
canalisations en polyamide non plastifié (PA-U) avec  
assemblages par soudage et assemblages mécaniques -  
Partie 2: Tubes (ISO 16486-2:2020)

Kunststoff-Rohrleitungssysteme für die Gasversorgung  
- Rohrleitungssysteme aus weichmacherfreiem  
Polyamid (PA-U) mit Schweißverbindungen und  
mechanischen Verbindungen - Teil 2: Rohre (ISO  
16486-2:2020)

This European Standard was approved by CEN on 4 September 2020.

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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.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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

## European foreword

This document (EN ISO 16486-2:2020) 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 April 2021, and conflicting national standards shall be withdrawn at the latest by April 2021.

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.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

The text of ISO 16486-2:2020 has been approved by CEN as EN ISO 16486-2:2020 without any modification.

## Annex (informative)

### A-deviation

**A-deviation:** National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN-CENELEC national member.

This European Standard does not fall under any Directive of the EU.

In the relevant CEN-CENELEC countries these A-deviations are valid instead of the provisions of the European Standard until they have been removed.

Country	Clause	Deviation
ITALY	§1 Scope	<p>According to Italian legislation concerning the safety of gas installation</p> <ul style="list-style-type: none"> <li>- DM 16 April 2008 (DSO) prescribes that piping and components used in distribution system shall be in accordance with national standard UNI 9034 (pipes with MOP below 5 bar). In case of MOP greater than 5 bar DM 17 April 2008 shall be followed. (Official Journal Italian Republic GU n. 107 of 8<sup>th</sup> May 2008 <a href="https://www.gazzettaufficiale.it/eli/id/2008/05/08/08A02871/sg">https://www.gazzettaufficiale.it/eli/id/2008/05/08/08A02871/sg</a>)</li> <li>- DM 17 April 2008 (TSO) prescribes that piping and components used in transmission system shall be made of steel (art. 3.1 of Technical Annex A to Decree). (Official Journal Italian Republic GU n. 107 of 8<sup>th</sup> May 2008 <a href="https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2008-05-08&amp;atto.codiceRedazionale=08A02872&amp;elenco30giorni=false">https://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2008-05-08&amp;atto.codiceRedazionale=08A02872&amp;elenco30giorni=false</a>)</li> </ul>

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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](http://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](http://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 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](http://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 4, *Plastics pipes and fittings for the supply of gaseous fuels*, 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 second edition cancels and replaces the first edition (ISO 16486-2:2012), which has been technically revised. It also incorporates ISO 16486-2:2012/Amd 1: 2014.

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

- [Tables 1](#) and [2](#) are extended with nominal outside diameters up to and including 630 mm;
- In [Table 2](#), former 6 hours has been changed to 16 hours in line with the phrasing in the table header;
- In [Table 3](#), the range for the minimum wall thickness is extended up to and including 37 mm;
- [Table 4](#) allows for  $e > 12$  mm to use Type 3 specimen with 10 mm/min for the determination of the elongation at break;
- Informative [Annex A](#) – Butt fusion procedure for jointing PA-U pipes – has been deleted;
- A new normative [Annex A](#) – Squeeze-off technique – has been added;
- A new informative [Annex B](#) – Examples of the water uptake over time as a function of the sample thickness – has been added.

A list of all parts in the ISO 16486 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](http://www.iso.org/members.html).

## Introduction

This document specifies the requirements for a piping system and its components made from unplasticized polyamide (PA-U), which is intended to be used for the supply of gaseous fuels.

Requirements and test methods for material and components, other than pipes of the piping system are specified in ISO 16486-1, ISO 16486-3, and ISO 16486-4.

Characteristics for fitness for purpose of the system and generic fusion parameters are covered in ISO 16486-5.

Recommended practice for installation is given in ISO 16486-6, which will not be implemented as a European Standard under the Vienna Agreement.

Assessment of conformity of the system is to form the subject of ISO/TS 16486-7<sup>1)</sup>.

NOTE Recommended practice for installation is also given in CEN/TS 12007-6, which has been prepared by Technical Committee CEN/TC 234, *Gas infrastructure*.

Parts 1, 2 (this document), 3, 5 and 6 (and future Part 7) of the ISO 16486 series have been prepared by ISO/TC 138/SC4. Part 4 has been prepared by ISO/TC 138/SC 7.

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1) Under preparation. Stage at the time of publication: ISO/WD TS 16486-7:2020.



# Plastics piping systems for the supply of gaseous fuels — Unplasticized polyamide (PA-U) piping systems with fusion jointing and mechanical jointing —

## Part 2: Pipes

### 1 Scope

This document specifies the physical and mechanical properties of pipes made from unplasticized polyamide (PA-U) in accordance with ISO 16486-1, intended to be buried and used for the supply of gaseous fuels. It also specifies the test parameters for the test methods to which it refers.

The ISO 16486 series of standards is applicable to PA-U piping systems, the components of which are connected by fusion jointing and/or mechanical jointing.

In addition, this document lays down dimensional characteristics and requirements for the marking of pipes.

Pipes conforming to this document are jointed typically by using mechanical, electrofusion or butt fusion techniques.

### 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 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 307, *Plastics — Polyamides — Determination of viscosity number*

ISO 1133-2, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 2: Method for materials sensitive to time-temperature history and/or moisture*

ISO 1167-1, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 1: General method*

ISO 1167-2, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 2: Preparation of pipe test pieces*

ISO 2505, *Thermoplastics pipes — Longitudinal reversion — Test method and parameters*

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

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

ISO 6259-3, *Thermoplastics pipes — Determination of tensile properties — Part 3: Polyolefin pipes*

ISO 11922-1, *Thermoplastics pipes for the conveyance of fluids — Dimensions and tolerances — Part 1: Metric series*

ISO 12176-4, *Plastics pipes and fittings — Equipment for fusion jointing polyethylene systems — Part 4: Traceability coding*