



**NSAI**  
Standards

Irish Standard  
I.S. EN ISO 16486-1:2020

Plastics piping systems for the supply of gaseous fuels - Unplasticized polyamide (PA-U) piping systems with fusion jointing and mechanical jointing - Part 1: General (ISO 16486-1:2020)



**I.S. EN ISO 16486-1:2020**

*Incorporating amendments/corrigenda/National Annexes issued since publication:*

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## National Foreword

I.S. EN ISO 16486-1:2020 is the adopted Irish version of the European Document EN ISO 16486-1:2020, Plastics piping systems for the supply of gaseous fuels - Unplasticized polyamide (PA-U) piping systems with fusion jointing and mechanical jointing - Part 1: General (ISO 16486-1:2020)

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**EUROPEAN STANDARD**  
**NORME EUROPÉENNE**  
**EUROPÄISCHE NORM**

**EN ISO 16486-1**

September 2020

ICS 75.200; 83.140.30

English Version

**Plastics piping systems for the supply of gaseous fuels -  
Unplasticized polyamide (PA-U) piping systems with  
fusion jointing and mechanical jointing - Part 1: General  
(ISO 16486-1:2020)**

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 1 : Généralités (ISO 16486-1:2020)

Kunststoff-Rohrleitungssysteme für die Gasversorgung  
- Rohrleitungssysteme aus weichmacherfreiem  
Polyamid (PA-U) mit Schweißverbindungen und  
mechanischen Verbindungen - Teil 1: Allgemeines (ISO  
16486-1:2020)

This European Standard was approved by CEN on 14 August 2020.

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.

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**EN ISO 16486-1:2020 (E)**

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## **European foreword**

This document (EN ISO 16486-1:2020) 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 March 2021, and conflicting national standards shall be withdrawn at the latest by March 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.

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## **Endorsement notice**

The text of ISO 16486-1:2020 has been approved by CEN as EN ISO 16486-1:2020 without any modification.



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# INTERNATIONAL STANDARD

**ISO  
16486-1**

Second edition  
2020-08

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

### **Part 1: General**

*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 1: Généralités*



Reference number  
ISO 16486-1:2020(E)

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**ISO 16486-1:2020(E)**



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## ISO 16486-1:2020(E)

## 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 16486-1:2012), which has been technically revised. It also replaces ISO 16486-1:2012/Amd 1:2014.

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

- In subclause [5.2.5](#) characteristics include the need to saturate pipes for LTHS testing;
- In [Table 1](#) the Carbon black content is changed to (1,0 to 2,5) % (by mass);
- In [Table 2](#) former 6 hours has been changed to 16 hours for conditioning before hydrostatic strength testing in line with the phrasing in the table header;
- In subclause [5.2.6](#) change of compound refers to PPI TR-3 as guidance;
- A new informative [Annex D](#) – Continuous liquid hydrocarbon exposure from transported fluid or soil contamination – has been added;
- A new informative [Annex E](#) – Permeation resistance against different gases – 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 general requirements for a piping system and its components made from unplasticized polyamide (PA-U), which are intended to be used for the supply of gaseous fuels.

Requirements and test methods for components of the piping system are specified in ISO 16486-2, 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 the future ISO/TS 16486-7<sup>1)</sup>.

NOTE 1 Recommended practice for installation is also given in CEN/TS 12007-6, which has been prepared by Technical Committee CEN/TC 234, *Gas infrastructure*.

NOTE 2 A list of ASTM standards related to polyamide pipes and fittings for the supply of gas is given in the Bibliography<sup>[1][2][3][4]</sup>.

Parts 1 (this document), 2, 3, 5 and 6 (and future Part 7) have been prepared by ISO/TC 138/SC 4. 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 1: General

### 1 Scope

This document specifies the general properties of unplasticized polyamide (PA-U) compounds for the manufacture of pipes, fittings and valves made from these compounds, 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 is applicable to PA-U piping systems, the components of which are connected by fusion jointing and/or mechanical jointing.

This document establishes a calculation and design scheme on which to base the maximum operating pressure (MOP) of a PA-U piping system.

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

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

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

ISO 472, *Plastics — Vocabulary*

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 1043-1, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics*

ISO 1110, *Plastic — Polyamides — Accelerated conditioning of test specimens*

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 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method*

ISO 1183-2, *Plastics — Methods for determining the density of non-cellular plastics — Part 2: Density gradient column method*



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