

<b>STN</b>	<b>Potrubné systémy z plastov na zásobovanie plynnými palivami Potrubné systémy z nemäkčeného polyamidu (PA-U) s tavným spojom a mechanickým spájaním Časť 1: Všeobecne (ISO 16486-1: 2020)</b>	<b>STN EN ISO 16486-1</b>  64 3064
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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 (ISO 16486-1:2020)

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 02/21

Obsahuje: EN ISO 16486-1:2020, ISO 16486-1:2020

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EUROPEAN STANDARD

EN ISO 16486-1

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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 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.

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

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

<b>Contents</b>	<b>Page</b>
<b>European foreword.....</b>	<b>3</b>
<b>Annex (informative) A-deviation.....</b>	<b>4</b>

## **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.

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

**EN ISO 16486-1:2020 (E)****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.</li> </ul> <p>(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>)</p> <ul style="list-style-type: none"> <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).</li> </ul> <p>(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>)</p>

**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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Phone: +41 22 749 01 11  
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# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>2</b>
3.1 Geometrical characteristics.....	2
3.2 Materials.....	3
3.3 Material characteristics.....	4
3.4 Related to service conditions.....	4
<b>4 Symbols and abbreviated terms</b> .....	<b>5</b>
4.1 Symbols.....	5
4.2 Abbreviated terms.....	5
<b>5 Material</b> .....	<b>6</b>
5.1 Material of the components.....	6
5.2 Compound.....	6
5.2.1 Additives.....	6
5.2.2 Colour.....	6
5.2.3 Identification compound.....	6
5.2.4 Rework material.....	6
5.2.5 Characteristics.....	6
5.2.6 Change of compound formulation.....	9
5.3 Fusion compatibility.....	9
5.4 Classification and designation.....	9
5.5 Maximum operating pressure (MOP).....	10
5.6 Effects of transport of liquid hydrocarbons and hydrogen.....	10
<b>Annex A (normative) Assessment of degree of pigment or carbon black dispersion in unplasticized polyamide compounds</b> .....	<b>11</b>
<b>Annex B (normative) Chemical resistance</b> .....	<b>15</b>
<b>Annex C (normative) Hoop stress at burst</b> .....	<b>18</b>
<b>Annex D (informative) Continuous liquid hydrocarbon exposure from transported fluid or soil contamination</b> .....	<b>20</b>
<b>Annex E (informative) Permeation resistance against different gases</b> .....	<b>21</b>
<b>Bibliography</b> .....	<b>24</b>

# 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*

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

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

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 6964, *Polyolefin pipes and fittings — Determination of carbon black content by calcination and pyrolysis — Test method*

ISO 9080, *Plastics piping and ducting systems — Determination of the long-term hydrostatic strength of thermoplastics materials in pipe form by extrapolation*

ISO 12162, *Thermoplastics materials for pipes and fittings for pressure applications — Classification, designation and design coefficient*

ISO 13477, *Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation (RCP) — Small-scale steady-state test (S4 test)*

ISO 13478, *Thermoplastics pipes for the conveyance of fluids — Determination of resistance to rapid crack propagation (RCP) — Full-scale test (FST)*

ISO 13479, *Polyolefin pipes for the conveyance of fluids — Determination of resistance to crack propagation — Test method for slow crack growth on notched pipes*

ISO 13954, *Plastics pipes and fittings — Peel decohesion test for polyethylene (PE) electrofusion assemblies of nominal outside diameter greater than or equal to 90 mm*

ISO 15512, *Plastics — Determination of water content*

ISO 16396-1, *Plastics — Polyamide (PA) moulding and extrusion materials — Part 1: Designation system, marking of products and basis for specifications*

ISO 16396-2, *Plastics — Polyamide (PA) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties*

ISO 16486-5, *Plastics piping systems for the supply of gaseous fuels — Unplasticized polyamide (PA-U) piping systems with fusion jointing and mechanical jointing — Part 5: Fitness for purpose of the system*

ISO 16871, *Plastics piping and ducting systems — Plastics pipes and fittings — Method for exposure to direct (natural) weathering*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**