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**Cevni sistemi iz polimernih materialov za oskrbo s plinastimi gorivi - Cevni sistemi iz nemehčanega poliamida (PA-U) z zvari in mehanskimi spoji - 3. del: Fitingi (ISO/DIS 16486-3:2019)**

Plastics piping systems for the supply of gaseous fuels - Unplasticized polyamide (PA-U) piping systems with fusion jointing and mechanical jointing - Part 3: Fittings (ISO/DIS 16486-3:2019)

Kunststoff-Rohrleitungssysteme für die Gasversorgung - Rohrleitungssysteme aus weichmacherfreiem Polyamid (PA-U) mit Schweißverbindungen und mechanischen Verbindungen - Teil 3: Formstücke (ISO/DIS 16486-3:2019)

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 3: Raccords (ISO/DIS 16486-3:2019)

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83.140.30	Polimerne cevi in fittingi za snovi, ki niso tekočine	Plastics pipes and fittings for non fluid use

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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 3: Fittings

*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 3: Raccords*

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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)).

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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*.

This second edition cancels and replaces the first edition (ISO 16486-3:2012), which has been technically revised.

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

- Amendment 1 of ISO 16486-3:2012 is incorporated;
- At [Table 1](#) electro fusion socket length has been revised and extended;
- [Tables 1](#) and [3](#) are extended with nominal outside diameters up to and including 630 mm;
- An editorial mistake of 6 hours has been changed to 16 hours for conditioning before hydrostatic strength testing in [Table 4](#) and before internal pressure testing in [Table 5](#);
- About the limited use of MVR a note to [Table 6](#) and a footnote in [Table 7](#) have been added;
- For transition fittings the reference to ISO 17885 is introduced;
- For Fusion system recognition reference is made to ISO 13950 and notes reference to ISO 12176-4 and ISO/DIS 12176-5;
- The title of [Clause 12](#) changed from Packaging to Delivery conditions,

ISO 16486 consists of the following parts, under the general title *Plastics piping systems for the supply of gaseous fuels — Unplasticized polyamide (PA-U) piping systems with fusion jointing and mechanical jointing*:

*Part 1: General*

*Part 2: Pipes*

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*Part 3: Fittings*

*Part 4: Valves*

*Part 5: Fitness for purpose of the system*

*Part 6: Code of practice for design, handling and installation*

*Part 7: Assessment of conformity of the system (proposal in preparation)*

A list of all parts in the ISO 16486- series can also be found on the ISO website.

Parts 1, 2, 3 (this document), 5 and 6 have been prepared by ISO/TC138/SC4, and a future part 7: *Assessment of conformity* is under preparation. Part 4 has been prepared by Technical Committee ISO/TC138/SC 7 *Valves and auxiliary equipment of plastics materials*.

Part 6 will not be implemented as European Standard under the Vienna Agreement.

NOTE Future CEN/TS 12007-x, *Gas infrastructure — Pipelines for maximum operating pressure up to and including 16 bar — Part x: Design, handling, installation and operation of unplasticized polyamide (PA-U) piping systems with fusion joining and mechanical jointing - Functional recommendation*, to be prepared by Technical Committee CEN/TC234 *Gas infrastructure* will deal with the recommended practice for installation of plastics pipes system in accordance with EN ISO 16486 (all parts except for part 6).

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).

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## Introduction

This part of ISO 16486 specifies the requirements for a piping system and its components made from unplasticized polyamide (PA-U), and which is intended to be used for the supply of gaseous fuels.

Requirements and test methods for material and components, other than fittings of the piping system are specified in ISO 16486-1, ISO 16486-2, 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 European Standard under the Vienna Agreement. Recommended practice for installation will be given in future CEN/TS 12007-x, *Gas infrastructure — Pipelines for maximum operating pressure up to and including 16 bar — Part x: Design, handling, installation and operation of unplasticized polyamide (PA-U) piping systems with fusion joining and mechanical jointing - Functional recommendation*, that is under preparation by Technical Committee CEN/TC234 *Gas infrastructure*.

This part of ISO 16486 covers the characteristics of fittings.

Assessment of conformity of the system is to form the subject of a future part 7.

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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 3: Fittings

### 1 Scope

This part of ISO 16486 specifies the physical and mechanical properties of fittings 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.

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

In addition, it lays down dimensional characteristics and requirements for the marking of fittings.

In conjunction with the other parts of ISO 16486, it is applicable to PA-U fittings, their joints, to joints with components of PA-U and to joints with mechanical fittings of other materials, and to the following fitting types:

- fusion fittings — electrofusion fittings and butt fusion fittings;
- transition fittings.

### 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 1110, *Plastics — 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 1167-4, *Thermoplastics pipes, fittings and assemblies for the conveyance of fluids — Determination of the resistance to internal pressure — Part 4: Preparation of assemblies*

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

ISO 4433-1, *Thermoplastics pipes — Resistance to liquid chemicals — Classification — Part 1: Immersion test method*

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

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

ISO/DIS 12176-5, *Plastics pipes and fittings – Equipment for fusion jointing polyethylene systems Part 5: Two-dimensional data coding of components and data exchange format for PE piping systems*

ISO 13950, *Plastics pipes and fittings — Automatic recognition systems for electrofusion joints*

ISO 13951, *Plastics piping systems — Test method for the resistance of plastic pipe/pipe or pipe/fitting assemblies to tensile loading*

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

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 13955, *Plastics pipes and fittings — Crushing decohesion test for polyethylene (PE) electrofusion assemblies*

ISO 13956, *Plastics pipes and fittings — Decohesion test of polyethylene (PE) saddle fusion joints — Evaluation of ductility of fusion joint interface by tear test*

ISO 13957, *Plastics pipes and fittings — Polyethylene (PE) tapping tees — Test method for impact resistance*

ISO 15512, *Plastics — Determination of water content*

ISO 16486-1, *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 16486-2, *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 16486-5, *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 17885, *Plastics piping systems — Mechanical fittings for pressure piping systems — Specifications*

EN 682, *Elastomeric seals — Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids*

IEC 60529:2013, *Degrees of protection provided by enclosures (IP Code)*

API 5L, *Specification to Line Pipe*

**3 Terms and definitions**

For the purposes of this document, the terms, definitions, symbols and abbreviated terms given in ISO 16486-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

**3.1****electrofusion socket fitting**

polyamide (PA-U) fitting which contains one or more integral heating elements that are capable of transforming electrical energy into heat to realise a fusion joint with a spigot end and/or a pipe