

**SLOVENSKI STANDARD
SIST EN ISO 16486-1:2024****01-marec-2024****Nadomešča:****SIST EN ISO 16486-1:2020**

Cevni sistemi iz polimernih materialov za oskrbo s plinastimi gorivi - Cevni sistemi iz nemehčanega poliamida (PA-U) z zvari in mehanskimi spoji - 1. del: Splošno (ISO 16486-1:2023)

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 16486-1:2023)

Kunststoff-Rohrleitungssysteme für die Gasversorgung - Rohrleitungssysteme aus weichmacherfreiem Polyamid (PA-U) mit Schweißverbindungen und mechanischen Verbindungen - Teil 1: Allgemeines (ISO 16486-1:2023)

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 16486-1:2023)

Ta slovenski standard je istoveten z: EN ISO 16486-1:2023

ICS:

75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment
83.140.30	Polimerne cevi in fittingi za snovi, ki niso tekočine	Plastics pipes and fittings for non fluid use

SIST EN ISO 16486-1:2024**en,fr,de**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 16486-1

December 2023

ICS 75.200; 83.140.30

Supersedes EN ISO 16486-1:2020

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 16486-1:2023)**

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 16486-1:2023)

Kunststoff-Rohrleitungssysteme für die Gasversorgung
- Rohrleitungssysteme aus weichmacherfreiem
Polyamid (PA-U) mit Schweißverbindungen und
mechanischen Verbindungen - Teil 1: Allgemeines (ISO
16486-1:2023)

This European Standard was approved by CEN on 19 May 2023.

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, 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, Türkiye 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

Contents	Page
European foreword.....	3

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[SIST EN ISO 16486-1:2024](https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024)

<https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024>

European foreword

This document (EN ISO 16486-1:2023) 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 June 2024, and conflicting national standards shall be withdrawn at the latest by June 2024.

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 16486-1:2020.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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, Türkiye and the United Kingdom.

iTeh Standards
(<https://standards.iteh.ai>)
Endorsement notice

The text of ISO 16486-1:2023 has been approved by CEN as EN ISO 16486-1:2023 without any modification.

[SIST EN ISO 16486-1:2024](https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024)

<https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024>

INTERNATIONAL STANDARD

ISO 16486-1

Third edition
2023-12

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

[SIST EN ISO 16486-1:2024](https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024)

<https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024>



Reference number
ISO 16486-1:2023(E)

© ISO 2023

ISO 16486-1:2023(E)

iTeh Standards (<https://standards.iteh.ai>) Document Preview

[SIST EN ISO 16486-1:2024](https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024)

<https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
3.1 Terms related to geometrical characteristics	3
3.2 Terms related to materials.....	3
3.3 Terms related to material characteristics	4
3.4 Terms related to service conditions.....	4
4 Symbols and abbreviated terms	5
4.1 Symbols.....	5
4.2 Abbreviated terms	5
5 Material	6
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 Virgin 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
Annex A (normative) Chemical resistance	11
Annex B (normative) Hoop stress at burst	14
Annex C (informative) Continuous liquid hydrocarbon exposure from transported fluid or soil contamination	16
Annex D (informative) Permeation of different gases	17
Bibliography	22

ISO 16486-1:2023(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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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.

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 third edition cancels and replaces the second edition (ISO 16486-1:2020), which has been technically revised.

The main changes are as follows:

- in [Table 1](#), the old requirement for "pigment or carbon black dispersion" has been substituted by new requirements with reference to ISO 18553 and no reference to Annex A. Footnote ^a has also been corrected;
- the former Annex A, "Assessment of degree of pigment or carbon black dispersion in unplasticized polyamide compounds," has been deleted and reference is made to ISO 18553 instead;
- in [Table D.2](#) and [Figure D.2](#), permeation coefficients of methane for PA-U 11 are given;
- in [Table D.4](#) and [Figure D.4](#), permeation coefficients of hydrogen for PA-U 11 are given.

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.

Introduction

This document specifies the general 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 materials and components of the piping system are specified in this document and in ISO 16486-2, ISO 16486-3 and ISO 16486-4.

Characteristics for fitness for purpose of the system and generic fusion parameters as well as related requirements and test methods 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 forms the subject of ISO/TS 16486-7.

ISO/TS 16486-8 specifies the training and assessment of fusion operators.

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

NOTE 2 EN 13067^[8] also gives recommendations for the qualification of welders for thermoplastics welded assemblies.

NOTE 3 A list of ASTM standards related to polyamide pipes and fittings for the supply of gas is given in the Bibliography.^{[9], [10], [11], [12]}

iTeh Standards (<https://standards.iteh.ai>) Document Preview

[SIST EN ISO 16486-1:2024](https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024)

<https://standards.iteh.ai/catalog/standards/sist/4b000c9c-8084-4fa8-9be8-80cf7b85bde9/sist-en-iso-16486-1-2024>