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BSI Standards Publication

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

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National foreword

This British Standard is the UK implementation of EN ISO 16486-5:2021. It is identical to ISO 16486-5:2021.

The UK participation in its preparation was entrusted to Technical Committee PRI/88, Plastics piping systems.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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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 5: Fitness for purpose of the system (ISO 16486-5:2021)

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 5: Aptitude à l'emploi du système (ISO 16486-5:2021)

Kunststoff-Rohrleitungssysteme für die Gasversorgung - Rohrleitungssysteme aus weichmacherfreiem Polyamid (PA-U) mit Schweißverbindungen und mechanischen Verbindungen - Teil 5: Gebrauchstauglichkeit des Systems (ISO 16486 5:2021)

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European foreword

This document (EN ISO 16486-5:2021) 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of an identical text or by endorsement, at the latest by November 2021, and conflicting national standards shall be withdrawn at the latest by November 2021.

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Endorsement notice

The text of ISO 16486-5:2021 has been approved by CEN as EN ISO 16486-5:2021 without any modification.

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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).

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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 16486-5:2012), which has been technically revised.

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

— for transition fittings, reference is made to ISO 17885;

— new Clause 5, Design Coefficient, has been added;

— Annex A refers to ISO 11414 for test piece assemblies by butt fusion and has been brought in line with ISO 12176-1 for butt fusion equipment.

— Annex A has been brought in line with ISO 21307, with a definition of PA fusion parameters for the single low-pressure and the single high-pressure butt fusion jointing procedures (the dual low-pressure procedure is not investigated for PA-U so far);

— in Table A.2 for the single low-pressure butt fusion procedure, the pressure, p_1, has been changed from (0,3 ± 0,1) MPa to (0,3 ± 0,05) MPa to raise the minimum pressure from 0,2 MPa to 0,25 MPa;

— Annex B refers to ISO 11413 for test piece assemblies by electro fusion and to ISO 12176-2 for electro fusion equipment;

— Annex C of ISO 16486-5:2012, Assessment of fitness for purpose of transition fittings, has been deleted;

— new Annex C, Derating coefficients for operating temperatures, has been transferred from ISO 16486-6;

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— new Annex D, Rapid crack propagation (RCP) resistance of pipe at temperature less than 0 °C, 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.

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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 of the piping system are specified in ISO 16486-1, ISO 16486-2, ISO 16486-3, and ISO 16486-4.

This document covers the characteristics for fitness for purpose of the system.

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

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.*

Assessment of conformity of the system is to form the subject the future ISO/TS 16486-7[1)].

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INTERNATIONAL STANDARD **ISO 16486-5:2021**

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

1 Scope

This document specifies the requirements of fitness for purpose of unplasticized polyamide (PA-U) piping system, intended to be buried and used for the supply of gaseous fuels. It also specifies the definitions of electrofusion and butt fusion joints.

This document specifies the method of preparation of test piece joints and the tests to be carried out on these joints for assessing the fitness for purpose of the system under normal and extreme conditions. 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.

In conjunction with the other parts of ISO 16486, it is applicable to PA-U fittings, their joints and to joints with components of PA-U.

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 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 11413:2019, *Plastics pipes and fittings — Preparation of test piece assemblies between a polyethylene (PE) pipe and an electrofusion fitting*

ISO 11414:2009, *Plastics pipes and fittings — Preparation of polyethylene (PE) pipe/pipe or pipe/fitting test piece assemblies by butt fusion*

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*

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