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

Tubes et raccords en matières plastiques — Préparation d'éprouvettes par assemblage tube/raccord électrosoudable en polyéthylène (PE)

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Foreword

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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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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 5, *General properties of pipes, fittings and valves of plastic materials and their accessories — Test methods and basic specifications*.

This third edition cancels and replaces the second edition (ISO 11413:2008) which has been technically revised.

The changes compared to the previous addition are as follows:

— normative references have been updated;

— Annex D has been technically revised.

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

1 Scope

This document specifies a method for the preparation of test pieces assembled from polyethylene (PE) pipes or spigot-ended fittings and electrofusion fittings (e.g. socket fittings such as couplers, or saddles).

The assembly criteria specified include parameters such as ambient temperature, fusion conditions, fitting and pipe dimensions, pipe configuration (coiled or straight pipe), taking into account the limiting service conditions specified by the relevant product standards.

This document can apply to other shapes, e.g. re-rounded pipes, dependent on the manufacturer's instructions.

NOTE For the purpose of this document, PE is understood to be PE, PE-RT or PE-X.

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 4427-2, *Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 2: Pipes*

ISO 4427-3, *Plastics piping systems — Polyethylene (PE) pipes and fittings for water supply — Part 3: Fittings*

ISO 4437-2, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 2: Pipes*

ISO 4437-3, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 3: Fittings*

ISO 12176-2, *Plastics pipes and fittings — Equipment for fusion jointing polyethylene systems — Part 2: Electrofusion*

ISO 14531-1, *Plastics pipes and fittings — Crosslinked polyethylene (PE-X) pipe systems for the conveyance of gaseous fuels — Metric series — Specifications — Part 1: Pipes*

ISO 15494, *Plastics piping systems for industrial applications — Polybutene (PB), polyethylene (PE), polyethylene of raised temperature resistance (PE-RT), crosslinked polyethylene (PE-X), polypropylene (PP) — Metric series for specifications for components and the system*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

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3.1
reference time
t_R
theoretical fusion time indicated by the fitting manufacturer for the reference ambient temperature

3.2
fusion energy
electrical energy supplied during the fusion-jointing cycle as measured at the terminals of the fitting at a given ambient temperature, T_a, and for electrical parameters whose values lie within the tolerance ranges stated by the manufacturer

Note 1 to entry: The fitting manufacturer is generally required to state in the technical file any variations in fusion energy input required as a function of the ambient temperature in the range T_{min} to T_{max}

Note 2 to entry: Where applicable, energy measurement should exclude the effect of terminal contact resistance.

3.3
reference energy
energy supplied to a fitting having a nominal electrical resistance and using the nominal fusion parameters defined by the manufacturer at the reference ambient temperature, T_R

3.4
maximum energy
maximum value of the fusion energy supplied for jointing at a given ambient temperature, T_a

3.5
minimum energy
minimum value of the fusion energy supplied for jointing at a given ambient temperature, T_a

3.6
nominal energy
nominal energy supplied for jointing at given ambient temperature, T_a

4 Symbols

4.1 General symbols (see Figure A.1)

d_e	outside diameter of a pipe or fitting spigot, which is equal to the nominal outside diameter
d_{em}	mean outside diameter of a pipe or fitting spigot in conformity with the relevant International Standard for the product concerned and calculated from the measured circumference
$d_{em,p}$	mean outside diameter of a pipe or fitting spigot after preparation for assembly with the outer layer removed by scraping or peeling and calculated from the circumference measured in a radial plane coincident with the centre of the fusion zone at a distance $L_3 + 0{,}5L_2$ from the face of the fitting socket after assembly
D_{im}	mean inside diameter of the fusion zone of a fitting in the radial plane located at distance $L_3 + 0{,}5L_2$ from the face of the fitting socket
$D_{im,max}$	maximum theoretical value of D_{im}, as stated by the fitting manufacturer
$D_{i,max}$	maximum inside diameter of the fusion zone of the fitting
$D_{i,min}$	minimum inside diameter of the fusion zone of the fitting
e_n	nominal wall thickness, in millimetres, of the pipe

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