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Oil and gas industries including lower carbon energy — Thermoplastics lined tubing for wells

Industries du pétrole et du gaz, y compris les énergies à faible teneur en carbone — Tubes à revêtement thermoplastique pour les puits

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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 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).

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This document was prepared by Technical Committee ISO/TC 67, *Oil and gas industries including lower carbon energy*, Subcommittee SC 5, *Casing, tubing and drill pipe*.

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Oil and gas industries including lower carbon energy — Thermoplastics lined tubing for wells

1 Scope

This document specifies requirements for downhole thermoplastics lined tubing (TLT) used in the oil and gas industries, including configuration, materials, manufacturing, inspection and testing, documentation, marking, packaging, transportation, storage and use.

This document is applicable to downhole thermoplastics lined tubing (TLT) used in contact with media related to oil and gas exploration and production (which involves multiphase flow, as well as water injection).

This document is suitable for thermoplastics including but not limited to polyethylene (PE), polyethylene of raised temperature resistance (PE-RT), ultra-high molecular weight polyethylene (PE-UHMW), crosslinked polyethylene (PE-X), polypropylene (PP), unplasticized polyamide (PA-U), polyketone (PK), polyphenylene sulfide (PPS), polyvinylidene fluoride (PVDF), and polyetheretherketone (PEEK) which meet the requirements of relevant design specifications, standards or regulations.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes the 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 472, *Plastics — Vocabulary*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 10405, *Petroleum and natural gas industries — Care and use of casing and tubing*

ISO 10893-3, *Non-destructive testing of steel tubes — Part 3: Automated full peripheral flux leakage testing of seamless and welded (except submerged arc-welded) ferromagnetic steel tubes for the detection of longitudinal and/or transverse imperfections*

ISO 11960, *Petroleum and natural gas industries — Steel pipes for use as casing or tubing for wells*

ISO 13678, *Petroleum and natural gas industries — Evaluation and testing of thread compounds for use with casing, tubing, line pipe and drill stem elements*

ISO 13679, *Petroleum and natural gas industries — Procedures for testing casing and tubing connections*

ISO 15156-2, *Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production — Part 2: Cracking-resistant carbon and low-alloy steels, and the use of cast irons*

ISO 15527, *Plastics — Compression-moulded sheets of polyethylene (PE-UHMW, PE-HD) — Requirements and test methods*

ISO 23936-1, *Petroleum, petrochemical and natural gas industries — Non-metallic materials in contact with media related to oil and gas production — Part 1: Thermoplastics*

API RP 5B1, *Gauging and Inspection of Casing, Tubing and Line Pipe Threads*

API Spec 5B, *Threading, Gauging, and Inspection of Casing, Tubing, and Line Pipe Threads*

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API Spec 15S:2022, *Spoolable Reinforced Plastic Line Pipe*

API TR 17TR2, *The Ageing of PA-11 in Flexible Pipes*

ASTM A700, *Standard Guide for Packaging, Marking, and Loading Methods for Steel Products for Shipment*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 472 and the following apply.

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

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

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

3.1.1
backing pipe
tubing before being lined with a thermoplastic *liner* (3.1.12)

[SOURCE: ISO/PAS 24565:2022, 3.1.1, modified — "ceramic liner" has been replaced by "a thermoplastic liner".]

3.1.2
batch release test
BRT
test performed by or on behalf of the manufacturer on a batch of products, which must be satisfactorily completed before the batch can be released

3.1.3
bonding strength
shear stress required to strip off the *liner* (3.1.12) from the *backing pipe* (3.1.1) along the axial direction

3.1.4
compatibility
degradation degree of material properties caused by physical or chemical reactions with produced or injected fluids, as well as the stability of the materials in sunlight

3.1.5
CB ring
corrosion barrier ring
polymeric ring inserted between adjacent lengths of *liner* (3.1.12) in a tubing string to provide continuity of corrosion protection

[SOURCE: ISO/PAS 24565:2022, 3.1.6, modified — The full form "corrosion barrier ring" has been changed from a preferred term to an admitted term.]

3.1.6
coupling
internally threaded cylinder for joining two lengths of threaded pipe

[SOURCE: ISO 11960:2020, 3.1.8]

3.1.7
drift mandrel
device used to check the size of casing and tubing before it is run

Note 1 to entry: The drift mandrel is put through each joint of casing and tubing to make certain the inside diameters are sizes specified for the particular job.

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