

SLOVENSKI STANDARD

SIST-TS CEN ISO/TS 24817:2012

01-januar-2012

Petrokemična industrija ter industrija za predelavo nafte in zemeljskega plina - Popravila cevovodov s kompozitnimi materiali - Ocenitev in načrtovanje, montaža, preskus in nadzor (ISO/TS 24817:2006)

Petroleum, petrochemical and natural gas industries - Composite repairs for pipework - Qualification and design, installation, testing and inspection (ISO/TS 24817:2006)

Erdöl-, petrochemische und Erdgasindustrie - Reparatur von Rohrleitungen mit Verbundwerkstoffe - Bewertung und Ausführung, Montage, Test und Inspektion (ISO/TS 24817:2006)

Industries du pétrole, de la pétrochimie et du gaz naturel - Réparations en matériau composite pour canalisations - Conformité aux exigences de performance et conception, installation, essai et inspection (ISO/TS 24817:2006)

Ta slovenski standard je istoveten z: CEN ISO/TS 24817:2011

ICS:

75.180.20 Predelovalna oprema Processing equipment

SIST-TS CEN ISO/TS 24817:2012 en,fr

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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
TECHNISCHE SPEZIFIKATION

CEN ISO/TS 24817

February 2011

ICS 75.180.20

English Version

**Petroleum, petrochemical and natural gas industries -
Composite repairs for pipework - Qualification and design,
installation, testing and inspection (ISO/TS 24817:2006)**

Industries du pétrole, de la pétrochimie et du gaz naturel -
Réparations en matériau composite pour canalisations -
Conformité aux exigences de performance et conception,
installation, essai et inspection (ISO/TS 24817:2006)

Erdöl-, petrochemische und Erdgasindustrie - Reparatur
von Rohrleitungen mit Verbundwerkstoffen - Bewertung und
Ausführung, Montage, Test und Inspektion (ISO/TS
24817:2006)

This Technical Specification (CEN/TS) was approved by CEN on 27 December 2010 for provisional application.

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Foreword

The text of ISO/TS 24817:2006 has been prepared by Technical Committee ISO/TC 67 “Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries” of the International Organization for Standardization (ISO) and has been taken over as CEN ISO/TS 24817:2011 by Technical Committee CEN/TC 12 “Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries” the secretariat of which is held by AFNOR.

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The text of ISO/TS 24817:2006 has been approved by CEN as a CEN ISO/TS 24817:2011 without any modification.

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TECHNICAL SPECIFICATION

**ISO/TS
24817**

First edition
2006-12-15

Petroleum, petrochemical and natural gas industries — Composite repairs for pipework — Qualification and design, installation, testing and inspection

*Industries du pétrole, de la pétrochimie et du gaz naturel — Réparations
en matériau composite pour canalisations — Conformité aux exigences
de performance et conception, installation, essai et inspection*

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Reference number
ISO/TS 24817:2006(E)

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Published in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote.
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 24817 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems*.

Introduction

The objective of ISO/TS 24817 is to ensure that composite repairs to pipework when qualified, designed, installed and inspected using ISO/TS 24817 will meet the specified performance requirements. Composite repairs are designed for use in oil and natural gas industry processing and utility service applications. The main users of this Technical Specification will be owners of the pipework, design contractors, suppliers contracted to deliver the repairs, certifying authorities, installation contractors and maintenance contractors.

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Petroleum, petrochemical and natural gas industries — Composite repairs for pipework — Qualification and design, installation, testing and inspection

1 Scope

This Technical Specification gives requirements and recommendations for the qualification and design, installation, testing and inspection for the external application of composite repairs to corroded or damaged pipework used in the petroleum, petrochemical and natural gas industries.

2 Normative references

The following referenced documents are indispensable for the application 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 75-3, *Plastics — Determination of temperature of deflection under load — Part 3: High-strength thermosetting laminates and long-fibre-reinforced plastics*

ISO 527-1, *Plastics — Determination of tensile properties — Part 1: General principles*

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ISO 527-4, *Plastics — Determination of tensile properties — Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites*

ISO 868, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness)*

ISO 10952, *Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Determination of resistance to chemical attack on the inside of a section in deflected condition*

ISO 11357-2, *Plastics — Differential scanning calorimetry (DSC) — Part 2: Determination of glass transition temperature*

ISO 11359-2, *Plastics — Thermomechanical analysis (TMA) — Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature*

ISO 14692 (all parts), *Petroleum and natural gas industries — Glass-reinforced plastics (GRP) piping*

ANSI/API RP 579, *Recommended Practice for Fitness-for-Service*

ASME B31G, *Manual for Determining the Remaining Strength of Corroded Pipelines: a Supplement to B31, Code for Pressure Piping*

ASTM C581, *Standard Practice for Determining Chemical Resistance of Thermosetting Resins Used in Glass-Fibre-Reinforced Structures Intended for Liquid Service*

ASTM D543, *Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents*

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ASTM D696, *Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between – 30 °C and 30 °C with a Vitreous Silica Dilatometer*

ASTM D1598, *Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure*

ASTM D1599, *Standard Test Method for Resistance to Short-Time Hydraulic Failure Pressure of Plastic Pipe, Tubing, and Fittings*

ASTM D2583, *Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor*

ASTM D2992, *Standard Practice for Obtaining Hydrostatic or Pressure Design Basis for “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe and Fittings*

ASTM D3039, *Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials*

ASTM D3165, *Standard Test Method for Strength Properties of Adhesives in Shear by Tension Loading of Single-Lap-Joint Laminated Assemblies*

ASTM D3681, *Standard Test Method for Chemical Resistance of “Fiberglass” (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe in a Deflected Condition*

ASTM D5379/D5379M-05, *Standard Test Method for Shear Properties of Composite Materials by the V-Notched Beam Method*

ASTM D6604, *Standard Practice for Glass Transition Temperatures of Hydrocarbon Resins by Differential Scanning Calorimetry*

ASTM E831, *Standard Test Method for Linear Thermal Expansion of Solid Materials by Thermomechanical Analysis*

ASTM E1640, *Standard Test Method for Assignment of the Glass Transition Temperature by Dynamic Mechanical Analysis*

ASTM E2092, *Standard Test Method for Distortion Temperature in Three-Point Bending by Thermomechanical Analysis*

ASTM G8, *Standard Test Methods for Cathodic Disbonding of Pipeline Coatings*

BS 7910, *Guide to methods for assessing the acceptability of flaws in metallic structures*

EN 59, *Glass reinforced plastics — Measurement of hardness by means of a Barcol impressor* (BS 2782-10: Method 1001, *Methods of testing plastics. Glass reinforced plastics. Measurement of hardness by means of a Barcol impressor*)

EN 1465, *Adhesives — Determination of tensile lap shear strength of rigid-to-rigid bonded assemblies*

3 Terms and definitions

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

3.1

anisotropic

exhibiting different physical properties in different directions

3.2

Barcol hardness

measure of surface hardness using a surface impressor

3.3**composite**

thermoset resin system that is reinforced by fibres

3.4**cure****curing**

setting of a thermosetting resin system, such as polyester or epoxy, by an irreversible chemical reaction

3.5**delamination**

separation of layers within a repair laminate or between a repair laminate and the substrate

3.6**differential scanning calorimetry****DSC**

method of determining the glass transition temperature of a thermosetting resin

3.7**glass transition temperature**

temperature at which a resin undergoes a marked change in physical properties

3.8**hardener**

component added to a thermosetting resin to effect cure

3.9**heat distortion temperature****HDT**

temperature at which a standard test bar deflects by a specified amount under a given load

3.10**in-fill material**

material used to repair external surface imperfections prior to the application of the composite laminate

3.11**laminate****repair laminate**

that part of a repair system that is the composite

NOTE

Most composites considered in this Technical Specification are composed of discrete lamina or layers which are wrapped or stacked one on top of the other. This stacked construction is the laminate.

3.12**leak**

condition of a substrate wall that can allow the contents to make contact with, and act directly upon, the (composite) repair laminate

NOTE

This does not refer to a fluid leaking through a hole or breach in the substrate.

3.13**occasional load**

load that occurs rarely and during a short time

NOTE

Occasional loads typically occur less than 10 times in the life of the component and each load duration is less than 30 min.

3.14**owner**

organization that owns or operates the substrate to be repaired