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Petroleum, petrochemicals and natural gas industries - Internal coating and lining of carbon steel process vessels - Part 1: Technical requirements (ISO 18796-1:2018)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

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**Petroleum, petrochemicals and natural gas industries -
Internal coating and lining of carbon steel process vessels -
Part 1: Technical requirements (ISO 18796-1:2018)**

Industries du pétrole, de la pétrochimie et du gaz naturel - Revêtement de protection interne et doublure des récipients de production en acier au carbone - Partie 1: Exigences techniques (ISO 18796-1:2018)

Erdöl-, petrochemische und Erdgasindustrie - Innere Schutzbeschichtungen und Auskleidungen für Prozessbehälter aus unlegiertem Stahl - Teil 1: Allgemeine Anforderungen (ISO 18796-1:2018)

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EN ISO 18796-1:2020 (E)

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European foreword

The text of ISO 18796-1:2018 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 EN ISO 18796-1:2020 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 NEN.

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Petroleum, petrochemicals and natural gas industries — Internal coating and lining of carbon steel process vessels —

Part 1: Technical requirements

*Industries du pétrole, de la pétrochimie et du gaz naturel —
Revêtement de protection interne et doublure des récipients de
production en acier au carbone —*

Partie 1: Exigences techniques



Reference number
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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.

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This document was prepared by ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

A list of all parts in the ISO 18796 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.

ISO 18796-1:2018(E)**Introduction**

The objective of this document is to define the minimum technical requirements for the corrosion protection by coating/lining of internal surfaces of carbon steel process vessels used in the oil and gas industry and subject to marked pressure/temperature changes and/or acidic or other aggressive chemicals. In addition, this document provides technical guidance for developing project specifications and helps to ensure compliance in coating/lining material selection and performance with contract requirements.

Further or differing requirements can be specified for individual applications. This document does not limit the contractor and/or manufacturer from proposing, or the company from accepting, alternative engineering solutions for the individual application. This can particularly be applicable where there is an innovative or emerging technology. Where an alternative is proposed, the specification issuer will need to identify any deviation from this document and provide details.

Petroleum, petrochemicals and natural gas industries — Internal coating and lining of carbon steel process vessels —

Part 1: Technical requirements

1 Scope

This document specifies the minimum technical requirements for surface preparation, materials, application, inspection and testing of internal coating and lining systems that are intended to be applied on internal surfaces of process vessels that are subject to marked pressure/temperature changes and/or potentially corrosive conditions or processes and aggressive chemicals, used in the oil and gas industry.

This document covers both new construction and maintenance works of process vessels as well as the repair of defective and deteriorated coating and lining systems.

This document also provides the minimum requirements for the coated and lined samples and the criteria for their approval.

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 2812 (all parts), *Paints and varnishes — Determination of resistance to liquids*

ISO 3233 (all parts), *Paints and varnishes — Determination of the percentage volume of non-volatile matter*

ISO 4624¹⁾, *Paints and varnishes — Pull-off test for adhesion*

ISO 7027, *Water quality — Determination of turbidity*

ISO 7619-1, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 1: Durometer method (Shore hardness)*

ISO 8501-1²⁾, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings*

ISO 8501-3, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 3: Preparation grades of welds, edges and other areas with surface imperfections*

ISO 8502-3, *Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 3: Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method)*

1) ASTM D4541 is equivalent to this document.

2) SSPC-SP5/NACE No. 1 is equivalent to this document.

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ISO 8502-6³⁾, *Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 6: Extraction of soluble contaminants for analysis — The Bresle method*

ISO 8502-9⁴⁾, *Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 9: Field method for the conductometric determination of water-soluble salts*

ISO 10474⁵⁾, *Steel and steel products — Inspection documents*

ISO 11124 (all parts), *Preparation of steel substrates before application of paints and related products — Specifications for metallic blast-cleaning abrasives*

ISO 11125 (all parts), *Preparation of steel substrates before application of paints and related products — Test methods for metallic blast-cleaning abrasives*

ISO 11126 (all parts), *Preparation of steel substrates before application of paints and related products — Specifications for non-metallic blast-cleaning abrasives*

ISO 11127-6, *Preparation of steel substrates before application of paints and related products — Test methods for non-metallic blast-cleaning abrasives — Part 6: Determination of water-soluble contaminants by conductivity measurement*

ISO 16276 (all parts)⁶⁾, *Corrosion protection of steel structures by protective paint systems — Assessment of, and acceptance criteria for, the adhesion/cohesion (fracture strength) of a coating*

ISO 19840⁷⁾, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces*

ISO 21809-3:2016⁸⁾, *Petroleum and natural gas industries — External coatings for buried or submerged pipelines used in pipeline transportation systems — Part 3: Field joint coatings*

ISO 29601⁹⁾, *Paints and varnishes — Corrosion protection by protective paint systems — Assessment of porosity in a dry film*

ISO 80000-1:2009, *Quantities and units — Part 1: General*

ASTM D522, *Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings*

ASTM D610, *Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces*

ASTM D714, *Standard Test Method for Evaluating Degree of Blistering of Paints*

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

ASTM D4060, *Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser*

ASTM D4285, *Standard Test Method for Indicating Oil or Water in Compressed Air*

ASTM D4414, *Standard Practice for Measurement of Wet Film Thickness by Notch Gages*

3) SSPC-Guide 15 is equivalent to this document (together with ISO 8502-9).

4) SSPC-Guide 15 is equivalent to this document (together with ISO 8502-6).

5) EN 10204 is equivalent to this document.

6) ASTM D4541 is equivalent to this document.

7) SSPC-PA2 is equivalent to this document.

8) ASMT G42 is equivalent to this document.

9) NACE SP0188 is equivalent to this document.

ASTM F21, Standard Test Method for Hydrophobic Surface Films by the Atomizer Test

NACE/TM 0174, Standard Test Method — Laboratory Methods for the Evaluation of Protective Coatings and Lining Materials on Metallic Substrates in Immersion Service

SSPC-SP1. Steel Structure Painting Council Surface Preparation Specifications — Solvent Cleaning

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