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Petroleum, petrochemical and natural gas industries - Internal coating and lining of steel storage tanks (ISO 16961:2015)

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

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/16

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 16961

August 2015

ICS 75.200

English Version

Petroleum, petrochemical and natural gas industries - Internal coating and lining of steel storage tanks (ISO 16961:2015)

Industries du pétrole, de la pétrochimie et du gaz naturel - Revêtement de protection interne et doublure des réservoirs de stockage en acier (ISO 16961:2015)

Erdöl-, petrochemische und Erdgasindustrie - Innere Schutzbeschichtungen und Auskleidungen für überirdische Stahltanklager (ISO 16961:2015)

This European Standard was approved by CEN on 20 May 2015.

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European foreword

This document (EN ISO 16961:2015) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" in collaboration with 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.

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of an identical text or by endorsement, at the latest by February 2016, and conflicting national standards shall be withdrawn at the latest by February 2016.

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Endorsement notice

The text of ISO 16961:2015 has been approved by CEN as EN ISO 16961:2015 without any modification.

INTERNATIONAL STANDARD

ISO 16961

First edition
2015-08-01

Petroleum, petrochemical and natural gas industries — Internal coating and lining of steel storage tanks

Industries du pétrole, de la pétrochimie et du gaz naturel — Revêtement de protection interne et doublure des réservoirs de stockage en acier

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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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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries.*

Introduction

This International Standard is based on GSO 2057 – 2010 (E). The objectives of this International Standard are to define minimum technical requirements for the corrosion protection by coating and lining of internal surfaces of steel storage tanks, to provide technical guidance for developing local standards and specifications, and to ensure compliance in coating and lining material selection and performance with contract requirements.

Users of this International Standard should be aware that further or differing requirements can be needed for individual applications. This International Standard is not limiting the contractor and/or manufacturer from proposing or the company from accepting alternative engineering solutions for the individual application. This can be particularly applicable where there is innovative or developing technology. Where an alternative is proposed, the specification issuer should identify any deviations from this International Standard and provide details.

Annexes A, B, C and D of this International Standard are informative only.

INTERNATIONAL STANDARD **ISO 16961:2015(E)**

Petroleum, petrochemical and natural gas industries — Internal coating and lining of steel storage tanks

1 Scope

This International Standard specifies the minimum requirements for surface preparation, materials, application, inspection and testing of internal coating lining systems that are intended to be applied on internal surfaces of steel storage tanks of crude oil, hydrocarbons and water for corrosion protection.

It covers both new construction and maintenance works of tank internal coating and lining as well as the repair of defective and deteriorated systems.

This International Standard also provides the minimum requirements for shop performance testing of the coated/lined samples and the criteria for their approval.

2 Conformance

2.1 Rounding

Unless otherwise stated in this International Standard, to determine conformance with the specified requirements, observed or calculated values shall be rounded to the nearest unit in the last right-hand place of figures used in expressing the limiting value, in accordance with ISO 80000-1:2009, Annex B, Rule A.

NOTE For the purpose of this provision, the rounding method of ASTM E29–08 is equivalent to ISO 80000-1:2009, Annex B, Rule A.

2.2 Compliance to this International Standard

A quality system should be applied to assist compliance with the requirements of this International Standard. ISO/TS 29001 gives sector-specific guidance on quality management systems.

The applicator shall comply with all of the applicable requirements of this International Standard. It shall be permissible for the client to make any investigations necessary in order to be ensured of compliance by the applicator and to reject any material that does not comply.

3 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API RP 652, *Lining of Aboveground Petroleum Storage Tank Bottoms*

API STD 653, *Tank Inspection, Repair, Alteration and Reconstruction*

API STD 2015, *Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks*

ASTM C868-02 (2012), *Standard Test Method for Chemical Resistance of Protective Linings*

ASTM D412, *Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers — Tension*

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 D790, *Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials*

ASTM D870, *Standard Practice for Testing Water Resistance of Coatings Using Water Immersion*

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 D4541, *Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers*

ASTM D4940, *Standard Test Method for Conductimetric Analysis of Water Soluble Ionic Contamination of Blasting Abrasives*

ASTM D5420, *Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact)*

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

ASTM G42, *Standard Test Method for Cathodic Disbonding of Pipeline Coatings Subjected to Elevated Temperatures*

EN 14020 (all parts), *Reinforcements — Specification for textile glass roving's*

ISO 2808, *Paints and varnishes — Determination of film thickness*

ISO 2812-1, *Paints and varnishes — Determination of resistance to liquids — Part 1: Immersion in liquids other than water*

ISO 3233 (all parts), *Paints and varnishes — Determination of percentage volume of non-volatile matter by measuring the density of a dried coating*

ISO 4624, *Paints and varnishes — Pull-off test*

ISO 4628-2, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 2: Assessment of degree of blistering*

ISO 4628-3, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 3: Assessment of degree of rusting*

ISO 7027, *Water quality — Determination of turbidity*

ISO 8501-1, *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)*

ISO 8502-6, *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 8502-9, *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 10474, *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 11126 (all parts), *Preparation of steel substrates before application of paints and related products — Specifications for non-metallic blast-cleaning abrasives*

ISO 11127-7, *Preparation of steel substrates before application of paints and related products — Test methods for non-metallic blast-cleaning abrasives — Part 7: Determination of water-soluble chlorides*

ISO 12944-3, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 3: Design considerations*

ISO 19840, *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 29601, *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*

NACE SP0188, *Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates*

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

SSPC-AB1, *Abrasive Specification No.1, Mineral and Slag Abrasive*

SSPC-AB2, *Abrasive Specification No.2, Cleanliness of Recycled Ferrous Metallic Abrasives*

SSPC-Guide 12, *Guide for Illumination of Industrial Painting Projects*

SSPC-PA 2, *Steel Structure Painting Council Surface Preparation Specifications Measurement of Dry Coating Thickness with Magnetic Gages*

SSPC-SP 1, *Steel Structure Painting Council Surface Preparation Specifications — Solvent Cleaning*

SSPC-SP 5/NACE No.1, *Joint Surface Preparation Standard-White Metal Blast* Cleaning

SSPC-SP 11, *Surface Preparation Standard, Power-Tool Cleaning to Bare Metal*