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Paints and varnishes — Friction-reduction coatings for the interior of on- and offshore steel pipelines for non-corrosive gases

Peintures et vernis — Revêtements réduisant le frottement pour l'intérieur de gazoducs en acier enterrés et immergés pour le transport de gaz non corrosifs

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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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 35, *Paints and varnishes*, Subcommittee SC 14, *Protective paint systems for steel structures*.

This second edition cancels and replaces the first edition (ISO 15741:2001), which has been technically revised.

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Introduction

Internal coating of pipelines is used to reduce friction and improve the flow conditions when conveying non-corrosive gases, and to offer sufficient corrosion protection during storage and transport of the pipes. The reduction in friction depends on various parameters like the pressure and temperature of the gas, and the diameter of the pipe. Therefore, it is not possible to give a single figure for this reduction in friction.

In order to establish sufficient corrosion protection and to ensure optimum performance of the internal coating in the steel pipes, it is necessary for owners of pipelines, planners, consultants, companies carrying out the work, inspectors of protective coatings and manufacturers of coating materials to have at their disposal state-of-the-art information in concise form including requirements for the coating. Such information has to be as complete as possible, unambiguous and easily understandable to avoid difficulties and misunderstandings between the parties concerned.

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Paints and varnishes — Friction-reduction coatings for the interior of on- and offshore steel pipelines for non-corrosive gases

1 Scope

This document specifies requirements and methods of test for liquid epoxy paints and internal coatings of such paints in steel pipes and fittings for the conveyance of non-corrosive gas. It also deals with the application of the paint. Other paints or paint systems are not excluded provided they comply with the requirements given in this document. The coating consists of one layer, which is normally shop-applied on blast-cleaned steel by airless spray or other suitable spraying techniques. The applied and cured paint film must be smooth to give the desired reduction in friction. Brush application is only used for small repair jobs.

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 2409, *Paints and varnishes — Cross-cut test*

ISO 2811 (all parts), *Paints and varnishes — Determination of density*

ISO 2812-1:2007, *Paints and varnishes — Determination of resistance to liquids — Part 1: Immersion in liquids other than water*

ISO 2812-2, *Paints and varnishes — Determination of resistance to liquids — Part 2: Water immersion method*

ISO 2815, *Paints and varnishes — Buchholz indentation test*

ISO 3233-1, *Paints and varnishes — Determination of the percentage volume of non-volatile matter — Part 1: Method using a coated test panel to determine non-volatile matter and to determine dry film density by the Archimedes principle*

ISO 3251, *Paints, varnishes and plastics — Determination of non-volatile-matter content*

ISO 6743-4, *Lubricants, industrial oils and related products (class L) — Classification — Part 4: Family H (Hydraulic systems)*

ISO 6860, *Paints and varnishes — Bend test (conical mandrel)*

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 8503-1, *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 1: Specifications and definitions for ISO surface profile comparators for the assessment of abrasive blast-cleaned surfaces*

ISO 8503-2, *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 2: Method for the grading of surface profile of abrasive blast-cleaned steel — Comparator procedure*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

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ISO 19840:2012, *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*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618 and the following 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 http://www.iso.org/obp

3.1
coater
company which is responsible for application of the coating material in accordance with the provisions of this document

3.2
coating material manufacturer
supplier of the coating material

3.3
dry film thickness
DFT
thickness of a coating remaining on the surface when the coating has hardened/cured

[SOURCE: ISO 12944-5:2007, 3.10]

3.4
natural gas
complex gaseous mixture of hydrocarbons, primarily methane, but generally also including ethane, propane and higher hydrocarbons in much smaller amounts and some non-combustible gases, such as nitrogen and carbon dioxide

[SOURCE: ISO 14532:2014, 2.1.1.1]

3.5
nominal dry film thickness
NDFT
dry film thickness specified for each coat or for the whole paint system

[SOURCE: ISO 12944-5:2007, 3.11]

3.6
pinhole
film defect characterized by small pore-like flaws in a coating which extend entirely through the applied film and have the general appearance of pinpricks when viewed by reflected light

3.7
purchaser
organization or individual that buys the coated pipes and fittings

4 Coating material

4.1 General

The coating material shall typically be a two-pack epoxy paint. It shall not contain any substances which will be released from the paint film after it has cured and are proven to be detrimental to the operation of the pipeline and the quality of the gas.

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