
Petrokemična industrija ter industrija za predelavo nafte in zemeljskega plina - Zunanja protikorozijska zaščita dvižnih cevi s prevlekami in oblogami - 2. del: Vzdrževanje in popravilo proizvodnih cevi na kraju samem (ISO/DIS 18797-2:2020)

Petroleum, petrochemical and natural gas industries - External corrosion protection of risers by coatings and linings - Part 2: Maintenance and field repair coatings for riser pipes (ISO/DIS 18797-2:2020)

Erdöl-, petrochemische und Erdgasindustrie - Äußerer Korrosionsschutz von Steigleitungen durch Beschichtungen und Auskleidungen - Teil 2: Wartungs- und Reparaturbeschichtungen für Steigleitungen (ISO/DIS 18797-2:2020)

Industries du pétrole, de la pétrochimie et du gaz naturel - Protection de la corrosion externe des tubes de production par revêtements et doublures - Partie 2: Entretien et réparation in situ des tubes de production (ISO/DIS 18797-2:2020)

Ta slovenski standard je istoveten z: prEN ISO 18797-2

ICS:

25.220.01	Površinska obdelava in prevleke na splošno	Surface treatment and coating in general
75.180.10	Oprema za raziskovanje, vrtanje in odkopavanje	Exploratory, drilling and extraction equipment

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DRAFT INTERNATIONAL STANDARD

ISO/DIS 18797-2

ISO/TC 67

Secretariat: NEN

Voting begins on:
2020-07-03Voting terminates on:
2020-09-25

Petroleum, petrochemical and natural gas industries - External corrosion protection of risers by coatings and linings —

Part 2: Maintenance and field repair coatings for riser pipes

Industries du pétrole, de la pétrochimie et du gaz naturel — Protection de la corrosion externe des tubes de production par revêtements et doublures —

Partie 2: Partie 2: Entretien et réparation in situ des tubes de production

ICS: 75.180.10

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Reference number
ISO/DIS 18797-2:2020(E)

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Published in Switzerland

Contents

	Page
Foreword	vi
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions	3
4 Symbols and abbreviated terms	6
4.1 Symbols.....	6
4.2 Abbreviated terms.....	7
5 Coating types	7
6 General requirements	7
6.1 Responsibility of the client.....	7
6.2 Rounding.....	7
6.3 Conformance to this document.....	8
7 Qualification processes and application procedures	8
7.1 General.....	8
7.2 Information to be supplied by the client.....	8
7.3 APS and ITP.....	9
7.4 Coating materials.....	11
7.5 Technical assessment of coating conformity.....	11
7.6 Procedure qualification trial.....	12
7.7 Pre-production trial.....	12
7.8 Production, testing and inspection.....	13
7.8.1 General.....	13
7.8.2 Inspection documents and traceability.....	13
8 Selection criteria for repair coatings	13
8.1 General.....	13
8.2 Application constraints.....	14
8.2.1 Wet substrates.....	14
8.2.2 Contamination by soluble salts.....	15
8.2.3 Dust contamination.....	15
8.2.4 Contamination by oil, grease and other petroleum-like products.....	15
8.2.5 Compatibility with existing coating.....	15
8.2.6 Feasibility of surface cleaning.....	16
8.2.7 Space and riser access constraints.....	16
8.2.8 Time constraints.....	16
8.2.9 Temperatures and relative humidity.....	16
8.2.10 Coating continuity.....	16
8.3 Operational conditions.....	17
8.3.1 Resistance to ageing, weathering and water.....	17
8.3.2 Resistance to mechanical loads.....	17
8.3.3 Interaction with cathodic protection.....	17
9 Test programs	17
9.1 Substrate conditions used for tests.....	17
9.2 Inspections, tests and frequencies.....	18
9.3 Retest.....	18
10 Non-crystalline low-viscosity polyolefin based coatings	18
10.1 Coating identification.....	18
10.2 Description of the coatings.....	19
10.3 Surface preparation.....	19
10.4 Application of coatings.....	20

ISO/DIS 18797-2:2020(E)

10.4.1	General	20
10.4.2	Overlap	20
10.5	Testing of coatings	20
10.5.1	General	20
10.5.2	Thickness	20
10.5.3	Glass transition temperature and crystallization temperature	21
10.5.4	Holiday detection	21
10.5.5	Drip resistance	21
10.5.6	Adhesion to pipe surface and existing coating	21
10.5.7	Lap shear resistance	22
10.5.8	Specific electrical insulation resistance	22
10.5.9	Impact resistance	22
10.5.10	Indentation resistance	22
10.5.11	Cathodic disbondment resistance	22
10.5.12	Resistance to ageing and weathering	23
10.5.13	Peel strength between layers of outer wrap	23
10.5.14	Thermal ageing resistance	23
10.5.15	Hot-water immersion test	24
11	Petrolatum and wax-based tape wrap systems	30
11.1	Coating identification	30
11.2	Description of the tape wrap systems	30
11.2.1	Petrolatum tape wrap systems (type 11A)	30
11.2.2	Wax-based tape wrap systems (type 11B)	31
11.3	Surface preparation	31
11.4	Application of coating systems	31
11.4.1	General	31
11.4.2	Overlap	31
11.5	Testing of the coating systems	32
11.5.1	General	32
11.5.2	Density	32
11.5.3	Dielectric strength	32
11.5.4	Thickness	32
11.5.5	Holiday detection	33
11.5.6	Impact resistance	33
11.5.7	Indentation resistance	33
11.5.8	Specific electrical insulation resistance	33
11.5.9	Cathodic disbondment resistance	33
11.5.10	Adhesion to pipe surface and existing coating	34
11.5.11	Drip resistance	34
11.5.12	Thermal ageing resistance	34
11.5.13	Hot water immersion test	34
11.5.14	Resistance to ageing and weathering	34
12	Polychloroprene based elastomeric coatings	41
12.1	Coating identification	41
12.2	Description of the coatings	41
12.3	Surface preparation	41
12.4	Application of the coating	42
12.4.1	General	42
12.4.2	Overlap	42
12.5	Testing of the coatings	42
12.5.1	General	42
12.5.2	Visual appearance	42
12.5.3	Thickness	42
12.5.4	Holiday detection	42
12.5.5	Hardness	43
12.5.6	Adhesion to pipe surface and existing coating	43
12.5.7	Cathodic disbondment resistance	43

12.5.8	Density.....	43
12.5.9	Rheometer curve.....	43
12.5.10	Tensile strength.....	43
12.5.11	Elongation at break.....	43
12.5.12	Tear strength.....	43
12.5.13	Electrical volume resistivity.....	44
12.5.14	Ozone resistance.....	44
12.5.15	Resistance to seawater.....	44
12.5.16	Hot-water immersion test.....	44
12.5.17	Thermal ageing resistance.....	44
12.5.18	Resistance to ageing and weathering.....	44
13	Liquid-applied epoxy coatings.....	47
13.1	Coating identification.....	47
13.2	Description of the liquid-applied epoxy coating.....	47
13.3	Surface preparation.....	48
13.4	Application of the coatings.....	48
	13.4.1 General.....	48
	13.4.2 Overlap.....	48
13.5	Testing of the coatings.....	48
	13.5.1 General.....	48
	13.5.2 Dry-film thickness.....	48
	13.5.3 Holiday detection.....	48
	13.5.4 Hardness.....	49
	13.5.5 Impact resistance.....	49
	13.5.6 Indentation resistance.....	49
	13.5.7 Specific electrical insulation resistance.....	49
	13.5.8 Cathodic disbondment resistance.....	49
	13.5.9 Adhesion to pipe surface and existing coating.....	49
	13.5.10 Thermal ageing resistance.....	49
	13.5.11 Hot-water immersion test.....	50
	13.5.12 Resistance to ageing and weathering.....	50
	Annex A (informative) Likelihood of exposure in splash zone area.....	54
	Bibliography.....	56

ISO/DIS 18797-2:2020(E)

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 of the voluntary nature of standards, 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 www.iso.org/iso/foreword.html.

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

A list of all parts in the ISO 18797 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.

Introduction

This document has been developed in response to worldwide demand for minimum specifications for field applied maintenance and repair coatings for riser pipes. ISO 18797-1 specifies the shop applied coatings for risers. Coated offshore risers are intermittently exposed to varying conditions. This includes – but is not limited to – sunlight, rain, snow, hail, water spray, salt spray, high humidity, fluctuating ambient temperatures (varying from sub-zero to high temperature), water currents, and impacts from waves and drifting debris, and marine growth. Exposure to such conditions can cause severe coating deterioration in time, resulting in ineffective corrosion prevention of the steel riser pipe.

Users of this document are advised that further or differing requirements can be utilized for individual applications. This document does not limit the contractor and/or manufacturer from proposing, or the client 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 is expected to identify any deviations from this document and provide details.

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Petroleum, petrochemical and natural gas industries - External corrosion protection of risers by coatings and linings —

Part 2: Maintenance and field repair coatings for riser pipes

1 Scope

This document specifies the selection criteria and minimum requirements for protective coating systems for field maintenance and repair of risers exposed to conditions in the splash zone.

This document does not cover the selection of techniques and materials used to restore integrity of the risers to be coated. This document neither covers the selection of additional mechanical protective materials that are not part of the described coating systems included in this document.

This document is applicable for maintenance requirements and field repairs of risers. New construction riser coatings and repair of damaged applied coatings before installation are covered in ISO 18797-1.

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2 Normative references (standards.iteh.ai)

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 34-1, *Rubber, vulcanized or thermoplastic — Determination of tear strength — Part 1: Trouser, angle and crescent test pieces*

ISO 37, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 48-2, *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2: Hardness between 10 IRHD and 100 IRHD*

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

ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

ISO 527-3, *Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets*

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

ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method*

ISO 1431-1, *Rubber, vulcanized or thermoplastic — Resistance to ozone cracking — Part 1: Static and dynamic strain testing*

ISO 1523, *Determination of flash point — Closed cup equilibrium method*

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 2781, *Rubber, vulcanized or thermoplastic — Determination of density*

ISO/DIS 18797-2:2020(E)

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

ISO 2811-1, *Paints and varnishes — Determination of density — Part 1: Pycnometer method*

ISO 3233-1, *Paints and varnishes — Determination of 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 3801, *Textiles — Woven fabrics — Determination of mass per unit length and mass per unit area*

ISO 4591, *Plastics — Film and sheeting — Determination of average thickness of a sample, and average thickness and yield of a roll, by gravimetric techniques (gravimetric thickness)*

ISO 4593, *Plastics — Film and sheeting — Determination of thickness by mechanical scanning*

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

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 4628-4, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 4: Assessment of degree of cracking*

ISO 4628-5, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 5: Assessment of degree of flaking*

ISO 4628-6, *Paints and varnishes — Evaluation of degradation of coatings — Designation of quantity and size of defects, and of intensity of uniform changes in appearance — Part 6: Assessment of degree of chalking by tape method*

ISO 4892-2, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 6502-2, *Rubber — Measurement of vulcanization characteristics using curemeters — Part 2: Oscillating disc curemeter¹⁾*

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 8501-4, *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness — Part 4: Initial surface conditions, preparation grades and flash rust grades in connection with high-pressure water jetting*

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 8502-4, *Preparation of steel substrates before application of paints and related products — Tests for the assessment of surface cleanliness — Part 4: Guidance on the estimation of the probability of condensation prior to paint application*

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 water soluble contaminants for analysis (Bresle method)*

1) ISO 6502-2 replaces ISO 3417, which has been withdrawn.

ISO 8502-9, *Preparation of steel substrate 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 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 8503-5, *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates — Part 5: Replica tape method for the determination of the surface profile*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 11357-1, *Plastics — Differential scanning calorimetry (DSC) — Part 1: General principles*

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

ISO 11357-3, *Plastics — Differential scanning calorimetry (DSC) — Part 3: Determination of temperature and enthalpy of melting and crystallization*

ISO 12944-9:2018, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 9: Protective paint systems and laboratory performance test methods for offshore and related structures*

ISO 16474-3, *Paints and varnishes — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps*

ISO 21809-3:2016, *Petroleum and natural gas industries — External coatings for buried or submerged pipelines used in pipeline transportation systems — Part 3: Field joint coatings*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

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

ASTM D149, *Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies*

ASTM D991, *Standard Test Method for Rubber Property — Volume Resistivity Of Electrically Conductive and Antistatic Products*

ASTM D1141, *Standard Practice for the Preparation of Substitute Ocean Water*

ASTM F22, *Standard Test Method for Hydrophobic Surface Films by the Water-Break Test*

NACE SP0274, *High-Voltage Electrical Inspection of Pipeline Coatings*

3 Terms and definitions

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

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

application procedure specification

document describing procedures, methods, equipment and tools used for coating application

ISO/DIS 18797-2:2020(E)**3.2****applicator**

organization appointed by the contractor to perform application of coatings/linings on riser pipes as per project procedures prepared in accordance with this document

3.3**atmospheric zone**

external surface of a riser that extends upward from the splash zone up to top decks of the platform which are exposed to sun, wind, sprays and rains

Note 1 to entry: Other definitions can be found in e.g. DNV-OS-C101 and NACE SP0176.

3.4**client**

organization for which professional services are rendered or person that receives a product

Note 1 to entry: For the purpose of this document the client is also considered as end user

3.5**complete coating**

installed coating ready for commissioning comprising all individual parts of the coating material

3.6**contractor**

organization appointed by the client to perform the works in accordance with this document

Note 1 to entry: For the purpose of this document, the contractor is also considered as applicator.

Note 2 to entry: For the purpose of this document, the contractor is also considered as purchaser.

3.7**end user**

company (companies) that own(s) and/or operate(s) risers

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3.8**failure mechanism**

process that leads to failure

Note 1 to entry: ISO 14224:2016. B.2.2 and Table B.2 define failure causes for all equipment classes.

3.9**failure mode**

manner in which failure occurs

Note 1 to entry: ISO 14224:2016. B.2.6 contains tables with relevant failure modes defining failure modes to be used for each equipment class.

3.10**inspection and testing plan**

document providing an overview of the sequence of inspections and tests, including standard references, recommended apparatuses (tools), and testing procedures

3.11**maintenance and repair of a coating**

activities dedicated to retain or restore the integrity of the existing coating in order to reach a level of protection against corrosion that enables a metallic structure to continue in service operation safely and economically for a determinate period

Note 1 to entry: Maintenance of a coating can refer to either coating repair which means the activities to restore damages that are localized on small areas and do not require the complete removal of existing coating, or coating rehabilitation which means the activities to restore damages over larger areas that require the complete removal of existing coating and installation of new coating.

Note 2 to entry: For the purpose of this document, all types of coating used for maintenance and repair of riser coatings are designated as "repair coating".

Note 3 to entry: In ISO 14224:2016, 3.49 "maintenance" is defined as combination of all technical and management actions intended to retain an item in, or restore it to, a state in which it can perform as required.

Note 4 to entry: In ISO 14224:2016, 3.8 "corrective maintenance" is defined as maintenance carried out after fault detection to effect restoration.

Note 5 to entry: "Repair" is a type of maintenance activity as defined in ISO 14224:2016, Table B.5.

3.12

manufacturer

organization responsible for the manufacture of coating material(s)

3.13

nominal strain at break elongation at break

nominal strain at the last recorded data point before the stress is reduced to less than or equal to 10 % of the strength if the break occurs after yielding

[SOURCE: ISO 527-1, 3.8.1]

3.14

pre-production trial

application of coating and subsequent inspection and testing of its properties, to confirm that the APS contains all necessary instructions to install the coatings in conformance with minimum requirements as stated in this document, carried out at job site immediate prior to production

3.15

procedure qualification trial

application of coating and subsequent inspection and testing of its properties, to confirm that the APS contains all necessary instructions to install the coatings in conformance with minimum requirements as stated in this document, carried out at the premises of the contractor or other agreed location

3.16

purchaser

party responsible for providing the purchase order requirements

3.17

riser

section of pipeline carrying crude oil or gas between ocean floor and upper decks of platform on offshore structures

Note 1 to entry: In ISO 14224:2016, "riser" is a specific equipment class as per Table A.4 (level 6), and "coating" is a "maintainable item" for risers, as per Table A.93.

3.18

self-healing of coating

ability of a coating to restore its original film thickness (leaving no holidays as a result), after a 6 mm diameter defect is made down to bare metal

3.19

shift

time period when a crew of workers is at work

3.20

splash zone

external surface of a riser that is periodically wet and dry by the influence of the astronomical tides, winds and waves

Note 1 to entry: The limits are as defined by the contract specifications.