

STN	Ropný a plynárenský priemysel. Tepelnoizolačné povlaky potrubí, zariadení a podmorských konštrukcií (ISO 12736: 2014).	STN EN ISO 12736 45 1415
------------	---	--

Petroleum and natural gas industries - Wet thermal insulation coatings for pipelines, flow lines, equipment and subsea structures (ISO 12736: 2014)

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. 05/15

Obsahuje: EN ISO 12736:2014, ISO 12736:2014

120738

Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, odbor SÚTN, 2015
Podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov sa môžu slovenské technické normy rozmnožovať a rozširovať iba so súhlasom Úradu pre normalizáciu, metrológiu a skúšobníctvo SR.

ICS 25.220.20; 75.180.10

English Version

Petroleum and natural gas industries - Wet thermal insulation coatings for pipelines, flow lines, equipment and subsea structures (ISO 12736:2014)

Industries du pétrole et du gaz naturel - Revêtements pour isolation thermique humide de canalisations, lignes d'écoulement et structures sous-marines (ISO 12736:2014)

Erdöl- und Erdgasindustrie- Wärmedämmschicht für Rohrleitungen, Vorlauf, Zubehör und Unterwasserkonstruktionen (ISO 12736:2014)

This European Standard was approved by CEN on 8 November 2014.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....3

Foreword

This document (EN ISO 12736:2014) 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 June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

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

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 12736:2014 has been approved by CEN as EN ISO 12736:2014 without any modification.

**Petroleum and natural gas
industries — Wet thermal insulation
coatings for pipelines, flow lines,
equipment and subsea structures**

*Industries du pétrole et du gaz naturel — Revêtements pour
isolation thermique humide de canalisations, lignes d'écoulement et
structures sous-marines*





COPYRIGHT PROTECTED DOCUMENT

© ISO 2014

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	3
4 Abbreviated terms	6
5 General recommendations and requirements	6
6 Qualification dossier	7
6.1 General.....	7
6.2 Content of qualification dossier.....	7
6.3 Anti-corrosion coating documentation.....	7
7 Layer test requirements	8
7.1 General.....	8
7.2 Ageing tests.....	8
7.2.1 General.....	8
7.2.2 Water absorption kinetic test.....	9
7.2.3 Wet heat ageing behaviour.....	10
7.2.4 Full insulation system ageing test (optional).....	10
7.2.5 Weathering and UV resistance.....	11
8 Insulation system test requirements	11
8.1 General.....	11
8.2 Full scale test program.....	12
8.2.1 Test summary.....	12
8.2.2 Baseline tests (optional).....	12
8.2.3 Simulated bend test.....	13
8.2.4 Cyclic (fatigue) bend test.....	13
8.2.5 Simulated tensioner test (optional).....	13
8.2.6 Impact test.....	14
8.2.7 Simulated service test (factory applied coating).....	14
8.2.8 Simulated service test (field joint).....	14
8.2.9 Simulated service test (subsea equipment) (optional).....	15
9 Application process and quality control	15
9.1 General.....	15
9.2 Qualification of operators.....	16
9.3 Application procedure specification (APS).....	16
9.4 Procedure qualification test (PQT).....	16
9.5 Pre-production test (PPT).....	17
9.6 Production tests.....	17
9.6.1 General.....	17
9.6.2 Polypropylene insulation system.....	17
9.6.3 Polyurethane insulation systems.....	19
9.6.4 Silicone insulation systems.....	23
9.6.5 Rubber insulation systems.....	25
9.6.6 Epoxy insulation systems.....	29
9.6.7 Phenolic insulation systems.....	31
9.7 Final documentation.....	33
10 Requirements for field joints	33
10.1 General.....	33
10.2 Specific information relevant for field joint design and qualification.....	34
10.3 Qualification requirements.....	34

10.4	Qualification of operators.....	34
10.5	Field joint coating APS/PQT/PPT.....	34
10.6	Production tests.....	35
10.6.1	Polypropylene field joint using injection moulded technique.....	35
10.6.2	Polyurethane field joint using casting technique.....	36
10.6.3	Elastomeric field joint coatings.....	39
10.7	Final documentation.....	41
11	Handling, storage and transportation requirements.....	41
Annex A	(normative) Hydrostatic compressive behaviour/Tri-axial test procedures.....	42
Annex B	(normative) Simulated bend test.....	47
Annex C	(normative) Cyclic (fatigue) bend test.....	49
Annex D	(normative) Simulated tensioner test.....	50
Annex E	(normative) Simulated impact test.....	52
Annex F	(normative) Simulated service test (factory applied coating).....	53
Annex G	(normative) Simulated service test (field joint).....	55
Annex H	(informative) Simulated service test (subsea equipment).....	57
Annex I	(normative) Ring shear test procedure.....	65
Annex J	(normative) Determination of mass ratio of glass microspheres, density of glass microspheres after processing and entrapped air ratio for glass syntactic materials.....	66
Annex K	(informative) End of life through thickness water profile calculation.....	69
Bibliography	74

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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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 Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 2, *Pipeline transportation systems*.

Introduction

Users of this International Standard are advised that further or differing requirements can be required for individual applications.

Petroleum and natural gas industries — Wet thermal insulation coatings for pipelines, flow lines, equipment and subsea structures

1 Scope

This International Standard defines the minimum requirements for qualification, application, testing, handling, storage and transportation of new and existing wet thermal insulation systems for pipelines, flowlines, equipment and subsea structures in the petroleum and natural gas industries. The purpose of these systems is to provide external corrosion protection and thermal insulation.

This International Standard is applicable to wet thermal insulation systems submerged in seawater.

This International Standard is not applicable to thermal insulation in the annulus of a steel pipe-in-pipe system.

2 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.

ISO 34 (all parts), *Rubber, vulcanized or thermoplastic — Determination of tear strength*

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

ISO 62, *Plastics — Determination of water absorption*

ISO 178, *Plastics — Determination of flexural properties*

ISO 527 (all parts), *Plastics — Determination of tensile properties*

ISO 813, *Rubber, vulcanized or thermoplastic — Determination of adhesion to a rigid substrate — 90 degree peel method*

ISO 844, *Rigid cellular plastics — Determination of compression properties*

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

ISO 1133 (all parts), *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics*

ISO 1172:1996, *Textile-glass-reinforced plastics — Prepregs, moulding compounds and laminates — Determination of the textile-glass and mineral-filler content — Calcination methods*

ISO 1183 (all parts), *Plastics — Methods for determining the density of non-cellular plastics*

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

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

ISO 2808:2007, *Paints and varnishes — Determination of film thickness*

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

ISO 2884 (all parts), *Paints and varnishes — Determination of viscosity using rotary viscometers*

ISO 12736:2014(E)

ISO 3104, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*

ISO 3219, *Plastics — Polymers/resins in the liquid state or as emulsions or dispersions — Determination of viscosity using a rotational viscometer with defined shear rate*

ISO 4590, *Rigid cellular plastics — Determination of the volume percentage of open cells and of closed cells*

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

ISO 4649, *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

ISO 4897, *Cellular plastics — Determination of the coefficient of linear thermal expansion of rigid materials at sub-ambient temperatures*

ISO 6502, *Rubber — Guide to the use of curemeters*

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

ISO 7822:1990, *Textile glass reinforced plastics — Determination of void content — Loss on ignition, mechanical disintegration and statistical counting methods*

ISO 8301, *Thermal insulation — Determination of steady-state thermal resistance and related properties — Heat flow meter apparatus*

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 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 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 11357 (all parts), *Plastics — Differential scanning calorimetry (DSC)*

ISO 14896, *Plastics — Polyurethane raw materials — Determination of isocyanate content*

ISO 15711, *Paints and varnishes — Determination of resistance to cathodic disbonding of coatings exposed to sea water*

ISO 21809-1:2011, *Petroleum and natural gas industries — External coatings for buried or submerged pipelines used in pipeline transportation systems — Part 1: Polyolefin coatings (3-layer PE and 3-layer PP)*

ISO 21809-3:2008, *Petroleum and natural gas industries — External coatings for buried or submerged pipelines used in pipeline transportation systems — Part 3: Field joint coatings*

EN 253, *District heating pipes — Preinsulated bonded pipe systems for directly buried hot water networks — Pipe assembly of steel service pipe*

ASTM D4060, *Standard test method for abrasion resistance of organic coatings by the taber abraser*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN