SLOVENSKI STANDARD
oSIST prEN ISO 21809-1:2006

01-december-2006

Naftna industrija in industrija zemeljskega plina - Zunanje prevleke za cevovode, zakopane v zemljo ali potopljene v vodo, v sistemih cevovodnega transporta - 1. del: Poliolefinske prevleke (3-slojni PE in 3-slojni PP) (ISO/DIS 21809-1:2006)

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/DIS 21809-1:2006)

Industries du pétrole et du gaz naturel - Revetements externes des conduites enterrées et immergées utilisées dans les systemes de transport par conduites - Partie 1: Revetements a base de polyoléfines (PE tri couche et PP tri couche) (ISO/DIS 21809-1:2006)

Ta slovenski standard je istoveten z: **prEN ISO 21809-1**

ICS:

75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment
77.140.75	Jeklene cevi in cevni profili za posebne namene	Steel pipes and tubes for specific use

oSIST prEN ISO 21809-1:2006 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

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DRAFT
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English Version

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/DIS 21809-1:2006)

Industries du pétrole et du gaz naturel - Revêtements externes des conduites enterrées et immergées utilisées dans les systèmes de transport par conduites - Partie 1: Revêtements à base de polyoléfines (PE tri couche et PP tri couche) (ISO/DIS 21809-1:2006)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee ECISS/TC 29.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. prEN ISO 21809-1:2006: E

Foreword

This document (prEN ISO 21809-1:2006) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum and natural gas industries" in collaboration with Technical Committee ECISS/TC 29 "Steel tubes and fittings for steel tubes", the secretariat of which is held by UNI.

This document is currently submitted to the parallel Enquiry.

Endorsement notice

The text of ISO/DIS 21809-1:2006 has been approved by CEN as prEN ISO 21809-1:2006 without any modifications.

DRAFT INTERNATIONAL STANDARD ISO/DIS 21809-1

ISO/TC **67**/SC **2** Secretariat: **NEN**

Voting begins on: **2006-09-21**

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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)

Industries du pétrole et du gaz naturel — Revêtements externes des conduites enterrées et immergées utilisées dans les systèmes de transport par conduites —

Partie 1: Revêtements à base de polyoléfines (PE tri couche et PP tri couche)

ICS 75.200

ISO/CEN PARALLEL ENQUIRY

The CEN Secretary-General has advised the ISO Secretary-General that this ISO/DIS covers a subject of interest to European standardization. **In accordance with the ISO-lead mode of collaboration as defined in the Vienna Agreement, consultation on this ISO/DIS has the same effect for CEN members as would a CEN enquiry on a draft European Standard.** Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

Conformément aux dispositions de la Résolution du Conseil 15/1993, ce document est distribué en version anglaise seulement.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 21809-1 was prepared by Technical Committee ISO/TC 67, *Petroleum and natural gas industries*, Subcommittee SC 2, *Pipeline transportation systems*.

ISO 21809 consists of the following parts, under the general title *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)*

— *Part 2: Fusion Bonded Epoxy Coatings*

— *Part 3: Field joint coatings*

— *Part 4: Polyethylene coatings (2-layer PE)*

— *Part 5: External concrete coatings*

Introduction

Users of this part of ISO 21809 should be aware that further or differing requirements might be needed for individual applications. This part of ISO 21809 is not intended to inhibit a vendor from offering, or the purchaser from accepting, alternative equipment or engineering solutions for the individual application. This can be particularly applicable where there is innovative or developing technology. Where an alternative is offered, the vendor should identify any variations from this part of ISO 21809 and provide details.

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)

1 Scope

This part of ISO 21809 specifies requirements of plant applied external three layer extruded polyethylene and polypropylene based coatings for corrosion protection of welded and seamless steel pipes for pipeline transportation systems in the petroleum and natural gas industries as defined in ISO 13623.

NOTE Pipes coated in accordance with this part of ISO 21809 are considered suitable to further protection by means of cathodic protection.

2 Normative references

The following referenced documents are indispensable for the application 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 31-0, *Quantities and units – Part 0: General principles*

ISO 179-1, *Plastics- Determination of Charpy impact properties – Part 1: Non- instrumented impact test*

ISO 179-2, *Plastics- Determination of Charpy impact properties – Part 1: Instrumented impact test*

ISO 306, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST))*

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

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

ISO 1872, *Plastics – Polyethylene (PE) moulding and extrusion materials – Part 2: Preparation of test specimens and determination of properties*

ISO 1873-2, *Plastics – Polypropylene (PP) moulding and extrusion materials – Part 2: Preparation of test specimens and determination of properties*

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

ISO 2811 (all parts), *Paint and varnishes- Determination of density*

ISO 3183 (all parts), *Petroleum and natural gas industries- steel pipe for pipelines*

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

ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters*

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

ISO 6964, *Polyolefin pipes and fittings - Determination of carbon black content by calcinations and pyrolysis; test method and basic specification*

ISO 8501(all parts), *Preparation of steel substrates before application of paints and related products — Visual assessment of surface cleanliness*

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

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

ISO 8503 (all parts), *Preparation of steel substrates before application of paints and related products — Surface roughness characteristics of blast-cleaned steel substrates*

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

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

ISO 11126, *Preparation of steel substrates before application of paints and related products – Specification 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 11357 (all parts), *Plastics — Differential scanning calorimetric (DSC) — Part 2: Determination of glass transition temperature*

ISO 13623, *Petroleum and natural gas industries — Pipeline transportation systems*

ISO 18533, *Method for the assessment of the degree of pigment or carbon black dispersion in polyolefin pipes, fittings and compounds*

ISO 15512, *Plastics – Determination of water content*

ASTM D 1693, *Standard Test Method for Environmental Stress-Cracking of Ethylene Plastics*

ASTM E-29-02, *Standard Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications*

ASTM D 4940, *Standard Test method for conductimetric analysis of water soluble ionic contamination of blasting abrasives*

3 Terms and definitions

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

3.1
applicator
company which undertakes the coating application in accordance with the provisions of this part of ISO 21809

NOTE If the compounding of the top layer is done prior to or during the application process by the applicator then he is considered as manufacturer (see 3.7)

3.2
application procedure specification
APS
document describing procedures, methods, equipment and tools to be used for coating application

3.3
batch
quantity of material produced in a continuous manufacturing operation using raw materials of the same source and grade

3.4
batch certificate
certificate of analysis issued by the manufacturer

3.5
certificate of compliance
one of the types of documents defined by ISO 10474 to be issued in accordance with the purchasing requirements

3.6
cut-back
length of pipe left uncoated at each end for joining purposes (e.g. welding)

3.7
design temperature range
temperature range including maximum and minimum temperature likely to be reached during transport, handling, installation and operation

3.8
end user
company operating the pipeline system

3.9
holiday
coating discontinuity that exhibits electrical conductivity when exposed to a specific voltage

3.10
inspection and testing plan
(ITP)
document providing an overview of the sequence of inspections and tests, including appropriate resources and procedures Symbols and abbreviated terms

3.11
manufacturer
company responsible for the manufacture of coating material(s)

3.12
manufacturer's specification
document which specifies the characteristics, test requirements and application recommendations for the coating materials.

3.13
operating temperature
temperature experienced by the pipe or pipeline system during operation which should not exceed the design temperature.

3.14
pipeline
those facilities through which fluids are conveyed, including pipe, pig traps, components and appurtenances, up to and including the isolating valves

[ISO 13623:2000]

3.15
pipeline system
pipeline with compressor or pump stations, pressure control stations, flow control stations, metering, tankage, supervisory control and data acquisition system (SCADA), safety systems, corrosion protection systems, and any other equipment, facility or building used in the transportation of fluids

[ISO 13623:2000]

3.16
procedure qualification trial
PQT
application of a coating and subsequent inspection/testing of its properties to confirm that the APS is adequate to produce coating of specified properties

3.17
purchaser
company responsible for providing the product order requirements

3.18
test report
document that provides the quantitative test results for tests conducted in accordance with the requirements of this part of ISO 21809

3.19
total coating thickness
sum of all three layers as defined in 8.1

4 Symbols and abbreviated terms

4.1 Symbols

ΔT_g	variation of the glass transition temperature (T_{g4} - T_{g3}) in °C
T_g	glass transition temperature in °C

4.2 Abbreviations

DSC	differential scanning calorimetry
ESC	Environmental stress cracking resistance
FBE	fusion bonded epoxy
HDPE	high density polyethylene
LDPE	low density polyethylene
M	nominal pipe mass per metre (kg/m)
MDPE	medium density polyethylene
MFR	melt flow rate
PE	Polyethylene
PP	Polypropylene
SAW	submerged arc welding
3LPE	three layer polyethylene coating
3LPP	three layer polypropylene coating

5 General requirements

5.1 Rounding

Unless otherwise stated in this part of ISO 21809, 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 31-0, Annex B; Rule A.

NOTE For the purpose of this provision, the rounding method of ASTM E 29 is equivalent to ISO 31-0, Annex B, Rule A

5.2 Compliance to standard

A quality system should be applied to assist compliance with the requirements of this document.

NOTE ISO/TS 29001[1] gives sector-specific guidance on quality management systems.

The applicator shall be responsible for complying with all of the applicable requirements of this part of ISO 21809. It shall be permissible for the purchaser to make any investigations necessary in order to be assured of compliance by the applicator and to reject any material that does not comply.

6 Coating classification

6.1 General

Coating class shall be selected based on the expected field duty. The transport, handling, laying conditions, operating conditions, soil conditions and the expected environmental conditions shall be considered in the selection of the coating thickness.

6.2 Coating classes

The coating shall be capable of withstanding the temperature range required as shown in Table 1. The coating class shall be specified in the purchase order.