

Petroleum and natural gas industries - Pipeline transportation systems - Design, construction and maintenance of steel cased pipelines (ISO 16440:2016)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 16440:2016 sisaldab Euroopa standardi EN ISO 16440:2016 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 16440:2016 consists of the English text of the European standard EN ISO 16440:2016.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 23.11.2016.	Date of Availability of the European standard is 23.11.2016.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 75.200, 77.140.75

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

**Petroleum and natural gas industries - Pipeline
transportation systems - Design, construction and
maintenance of steel cased pipelines (ISO 16440:2016)**

Industries du pétrole et du gaz naturel - Systèmes de
transport par conduites - Conception, construction et
maintenance de conduites en fourreau en acier (ISO
16440:2016)

Erdöl- und Erdgasindustrien - Rohrleitungs-
Transportsysteme - Auslegung, Konstruktion und
Instandhaltung von stahlverkleideten Rohrleitungen
(ISO 16440:2016)

This European Standard was approved by CEN on 7 August 2016.

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

European foreword

This document (EN ISO 16440:2016) 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 NEN.

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 May 2017, and conflicting national standards shall be withdrawn at the latest by May 2017.

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 16440:2016 has been approved by CEN as EN ISO 16440:2016 without any modification.

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Design	2
4.1 General	2
4.2 Carrier pipe design	3
4.3 Casing design	3
4.4 Electrical isolation	4
4.5 Corrosion protection	4
5 Installation	4
5.1 General	4
5.2 Handling and storage	4
5.3 New casing	4
5.3.1 General	4
5.3.2 Carrier pipe installation	5
5.3.3 Casing end seals	6
5.3.4 Test leads	6
5.3.5 Backfilling	7
5.4 Split-sleeve type casing extensions and installations	7
6 Inspection and monitoring	8
6.1 General	8
6.2 Integrity inspection of carrier pipe	8
6.3 Monitoring of carrier pipe and casing	9
6.4 Leakage survey	9
6.5 Corrosiveness of the annular space	9
7 Maintenance and repair	9
7.1 General	9
7.2 Maintenance of vents and test leads	10
7.3 Clearing of shorted casings	10
7.4 Filling of casings	11
7.5 Removal of casings	11
Annex A (informative) Casing filling procedures for Dielectric Filler Materials	12
Annex B (informative) Examples of cathodic protection testing and monitoring techniques for carrier pipes and casings	15
Annex C (informative) Inspection tools for cased carrier pipe	30
Annex D (informative) Clearing a shorted casing	35
Annex E (informative) Removing and cutting a casing	37
Bibliography	39

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

Introduction

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

Petroleum and natural gas industries — Pipeline transportation systems — Design, construction and maintenance of steel cased pipelines

1 Scope

This document specifies requirements, including corrosion protection, for the design, fabrication, installation and maintenance of steel-cased pipelines for pipeline transportation systems in the petroleum and natural gas industries in accordance with ISO 13623.

NOTE 1 Steel casings can be used for mechanical protection of pipelines at crossings, such as at roads and railways and the installation of a casing at a highway, railway, or other crossing can be required by the permitting agency or pipeline operator.

NOTE 2 This document does not imply that utilization of casings is mandatory or necessary.

NOTE 3 This document does not imply that cased crossings, whether electrically isolated or electrically shorted, contribute to corrosion of a carrier pipe within a cased crossing. However, cased crossings can adversely affect the integrity of the carrier pipe by shielding cathodic protection (CP) current to the carrier pipe or reducing the CP effectiveness on the carrier pipe in the vicinity of the casing. Their use is not recommended unless required by load considerations, unstable soil conditions, or when their use is dictated by sound engineering practices.

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 15589-1, *Petroleum, petrochemical and natural gas industries — Cathodic protection of pipeline systems — Part 1: On-land pipelines*

EN 12954, *Cathodic protection of buried or immersed metallic structures — General principles and application for pipelines*

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:

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

3.1

carrier pipe

pipe that conveys the fluid

Note 1 to entry: Note to entry: This applies to both transmission and distribution piping.

3.2

casing

steel pipe installed around a carrier pipe for mechanical protection