

# **Petroleum and natural gas industries - Induction bends, fittings and flanges for pipeline transportation systems - Part 1: Induction bends**

Petroleum and natural gas industries - Induction  
bends, fittings and flanges for pipeline transportation  
systems - Part 1: Induction bends

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

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| <p>Käesolev Eesti standard EVS-EN 14870-1:2004 sisaldab Euroopa standardi EN 14870-1:2004 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 21.12.2004 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p> | <p>This Estonian standard EVS-EN 14870-1:2004 consists of the English text of the European standard EN 14870-1:2004.</p> <p>This document is endorsed on 21.12.2004 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p> |
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| <p><b>Käsitlusala:</b></p> <p>This part of EN 14870 specifies the technical delivery conditions for bends made by the induction bending process for use in pipeline transportation systems for the petroleum and natural gas industries as defined in ISO 13623.</p> | <p><b>Scope:</b></p> <p>This part of EN 14870 specifies the technical delivery conditions for bends made by the induction bending process for use in pipeline transportation systems for the petroleum and natural gas industries as defined in ISO 13623.</p> |
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**ICS** 23.040.40, 23.040.60, 75.200

**Võtmesõnad:**

ICS 75.200; 23.040.40; 23.040.60

English version

**Petroleum and natural gas industries - Induction bends, fittings  
and flanges for pipeline transportation systems - Part 1:  
Induction bends (ISO 15590-1:2001 modified)**

Industries du pétrole et du gaz naturel - Coudes d'induction,  
raccords et brides pour systèmes de transport par  
conduites -Partie 1: Coudes d'induction (ISO 15590-1:2001  
modifiée)

Erdöl- und Erdgasindustrie - Im Induktionsverfahren  
gefertigte Rohrbögen, Fittings und Flansche für  
Rohrleitungstransportsysteme - Teil 1: Im  
Induktionsverfahren gefertigte Rohrbögen (ISO 15590-  
1:2001 modifiziert)

This European Standard was approved by CEN on 15 July 2004.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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



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## Explanatory Note

ISO 15590-1:2001, developed within ISO/TC 67 SC 2, has been adopted as EN 14870-1:2004 (ISO 15590-1 : 2001 modified).

The scope of ISO/TC 67/SC 2 is pipeline transportation systems for the petroleum and natural gas industries without exclusions. However in CEN, the scopes of CEN/TC 12 and CEN/TC 234 overlapped until 1995. This scope overlap caused problems for the parallel procedure for the above-mentioned items. The conflict in scope was resolved when both the CEN/Technical Committees and the CEN/BT took the following resolution:

**Resolution BT 38/1995:**

**Subject: Revised scope of CEN/TC 12**

***“BT endorses the conclusions of the coordination meeting between CEN/TC 12 “Materials, equipment and offshore structures for petroleum and natural gas industries” and CEN/TC 234 “Gas supply” and modifies the CEN/TC 12 scope, to read:***

***“Standardization of the materials, equipment and offshore structures used in drilling, production, refining and the transport by pipelines of petroleum and natural gas, excluding on-land supply systems used by the gas supply industry and those aspects of offshore structures covered by IMO requirement (ISO/TC 8).***

***The standardization is to be achieved wherever possible by the adoption of ISO Standards.”***

Resulting from Resolution BT 38/1995, ***“gas supply on land”*** has been excluded from the scope of ISO 15590-1 : 2001 for the European adoption by CEN/TC 12.

## Foreword

The text of ISO 15590-1:2001 has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum and natural gas industries" of the International Organization for Standardization (ISO) and has been taken over as EN 14870-1:2004 by 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 April 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

International Standard ISO 15590-1 was prepared by Technical Committee ISO/TC 67, Materials, equipment and offshore structures for petroleum and natural gas industries, Subcommittee SC 2, Pipeline transportation systems.

EN 14870 consists of the following parts, under the general title *Petroleum and natural gas industries — Induction bends, fittings and flanges for pipeline transportation systems* :

- *Part 1 : Induction bends*
- *Part 2 : Fittings*
- *Part 3 : Flanges*

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

## Introduction

Users of this part of EN 14870 should be aware that further or differing requirements may be needed for individual applications. This part of EN 14870 is not intended to inhibit a manufacturer 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 manufacturer should identify any variations from this part of EN 14870 and provide details.

## 1 Scope

This part of EN 14870 specifies the technical delivery conditions for bends made by the induction bending process for use in pipeline transportation systems for the petroleum and natural gas industries as defined in ISO 13623.

This part of EN 14870 is applicable to induction bends made from seamless and welded pipe of unalloyed or low-alloy steels.

This part of EN 14870 specifies three classes of induction bend corresponding to increasing quality requirements in accordance with the technical delivery conditions of ISO 3183 for pipe as indicated in Table 1 (see also ISO 3183-3:1999, Introduction).

**Table 1 — Induction bend class and corresponding pipe standard**

| Induction bend class | Corresponding pipe standard |
|----------------------|-----------------------------|
| Class A              | ISO 3183-1                  |
| Class B              | ISO 3183-2                  |
| Class C              | ISO 3183-3                  |

This part of EN 14870 is not applicable to the selection of the induction bend class.

This part of EN 14870 is not applicable to pipeline bends made by other manufacturing processes.

On-land supply systems used by the gas supply industry are excluded from the scope of this standard.

## 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 148, *Steel – Charpy impact test (V-notch)*.

EN ISO 377, *Steel and steel products - Location and preparation of samples and test pieces for mechanical testing (ISO 377:1997)*

ISO 783, *Metallic materials – Tensile testing at elevated temperature*.

EN ISO 2566-1, *Steel – Conversion of elongation values – Part 1 : Carbon and low alloy steels (ISO 2566-1:1984)*.

ISO 3183-1, *Petroleum and natural gas industries – Steel pipe for pipelines – Technical delivery conditions – Part 1 : Pipes of requirement class A*.

ISO 3183-2, *Petroleum and natural gas industries – Steel pipe for pipelines – Technical delivery conditions – Part 2 : Pipes of requirement class B*.

ISO 3183-3:1999, *Petroleum and natural gas industries – Steel pipe for pipelines – Technical delivery conditions – Part 3 : Pipes of requirement class C*.

EN ISO 6507-1, *Metallic materials – Vickers hardness test – Part 1 : Test method (ISO 6507-1:1997)*



ISO 6892, *Metallic materials – Tensile testing at ambient temperature.*

EN ISO 7438, *Metallic materials – Bend test (ISO 7438:1985).*

ISO/TR 7705:1991, *Guidelines for specifying Charpy V-notch impact prescriptions in steel specifications.*

EN 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 8501-1:1988).*

ISO 9305, *Seamless steel tubes for pressure purposes – Full peripheral ultrasonic testing for the detection of transverse imperfections.*

ISO 9712, *Non-destructive testing – Qualification and certification of personnel.*

ISO 10124, *Seamless and welded (except submerged arc-welded) steel tubes for pressure purposes – Ultrasonic testing for the detection of laminar imperfections.*

ISO 10474, *Steel and steel products – Inspection documents.*

ISO 11496, *Seamless and welded steel tubes for pressure purposes – Ultrasonic testing of tube ends for the detection of laminar imperfections.*

ISO 12094, *Welded steel tubes for pressure purposes – Ultrasonic testing for the detection of laminar imperfections in strips/plates used in the manufacture of welded tubes.*

ISO 12095, *Seamless and welded steel tubes for pressure purposes – Liquid penetrant testing.*

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

ISO 13664, *Seamless and welded steel tubes for pressure purposes – Magnetic particle inspection of the tube ends for the detection of laminar imperfections.*

ISO 13665, *Seamless and welded steel tubes for pressure purposes – Magnetic particle inspection of the tube body for the detection of surface imperfections.*

ASTM E 112, *Standard test methods for determining average grain size.*

ASTM E 340, *Standard test method for macroetching metals and alloys.*

ASTM E 797, *Standard practice for measuring thickness by manual ultrasonic pulse-echo contact method.*

EN ISO 15156-2:2003, *Petroleum, petrochemical and natural gas industries - Materials for use in H<sub>2</sub>S-containing environments in oil and gas production - Part 2: Cracking-resistant carbon and low alloy steels, and the use of cast irons (ISO 15156-2:2003)*

### 3 Terms and definitions

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

#### 3.1

##### **arc**

curved portion of a bend