

**Petroleum and natural gas industries -  
Design and installation of piping systems  
on offshore production platforms**

Petroleum and natural gas industries - Design and installation of piping systems on offshore production platforms

## EESTI STANDARDI EESSÖNA

## NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 13703:2001 sisaldb Euroopa standardi EN ISO 13703:2000 + AC:2002 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 13703:2001 consists of the English text of the European standard EN ISO 13703:2000 + AC:2002.
Käesolev dokument on jõustatud 18.05.2001 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.	This document is endorsed on 18.05.2001 with the notification being published in the official publication of the Estonian national standardisation organisation.
Standard on kätesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

<b>Käsitlusala:</b> This International Standard specifies minimum requirements and gives guidance for the design and installation of new piping systems on production platforms located offshore for the petroleum and natural gas industries. It covers piping systems up to 69 000 kPa (ga) maximum, within temperature range limits for the materials meeting the requirements of ASME B31.3.	<b>Scope:</b> This International Standard specifies minimum requirements and gives guidance for the design and installation of new piping systems on production platforms located offshore for the petroleum and natural gas industries. It covers piping systems up to 69 000 kPa (ga) maximum, within temperature range limits for the materials meeting the requirements of ASME B31.3.
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**ICS 75.180.10**

**Võtmesõnad:**

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN ISO 13703

December 2000

ICS 07.018.10

English version

Petroleum and natural gas industries - Design and  
installation of piping systems on offshore production  
platforms (ISO 13703:2000 + AC:2002)

Industries du pétrole et du gaz naturel - Conception et  
installation de systèmes de tuyauterie sur les plates-formes  
de production en mer (ISO 13703:2000 + AC:2002)

Erdöl- und Erdgasindustrie – Auslegung und Verlegung  
von Rohrleitungssystemen auf Offshore-Plattformen  
(ISO 13703:2000 + AC:2002)

This European Standard was approved by CEN on 9 December 2000.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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

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

— Leerseite —

This document is a preview generated by EVS

**Contents**

Page

<b>Foreword</b> .....	v
<b>Introduction</b> .....	vi
<b>1 Scope</b> .....	1
<b>2 Normative references</b> .....	1
<b>3 Terms, definitions, symbols and abbreviated terms</b> .....	2
<b>3.1 Terms and definitions</b> .....	2
<b>3.2 Symbols and abbreviated terms</b> .....	4
<b>4 General considerations</b> .....	6
<b>4.1 Materials</b> .....	6
<b>4.2 Code of pressure piping</b> .....	7
<b>4.3 Demarcation between systems with different pressure ratings</b> .....	7
<b>4.4 Corrosion considerations</b> .....	9
<b>5 Piping design</b> .....	10
<b>5.1 Pipe material grades</b> .....	10
<b>5.2 Sizing criteria — General</b> .....	12
<b>5.3 Sizing methods for liquid lines</b> .....	12
<b>5.4 Sizing criteria for single-phase gas lines</b> .....	19
<b>5.5 Sizing criteria for gas/liquid two-phase lines</b> .....	23
<b>5.6 Pipe wall thicknesses</b> .....	26
<b>5.7 Joint connections</b> .....	30
<b>5.8 Expansion and flexibility</b> .....	31
<b>5.9 Start-up provisions</b> .....	32
<b>6 Selection of valves</b> .....	32
<b>6.1 General</b> .....	32
<b>6.2 Types of valves</b> .....	33
<b>6.3 Fire resistance of valves</b> .....	35
<b>6.4 Valve sizing</b> .....	35
<b>6.5 Valve pressure and temperature ratings</b> .....	36
<b>6.6 Valve materials</b> .....	37
<b>7 Fittings and flanges</b> .....	37
<b>7.1 General</b> .....	37
<b>7.2 Welded fittings</b> .....	38
<b>7.3 Screwed fittings</b> .....	38
<b>7.4 Branch connections</b> .....	38
<b>7.5 Flanges</b> .....	39
<b>7.6 Proprietary connectors</b> .....	41
<b>7.7 Special requirements for sulfide stress-cracking service</b> .....	41
<b>7.8 Erosion prevention</b> .....	41
<b>8 Design considerations for particular piping systems</b> .....	41
<b>8.1 General</b> .....	41
<b>8.2 Wellhead accessory items</b> .....	41
<b>8.3 Flowline and flowline accessories</b> .....	42
<b>8.4 Production manifolds</b> .....	45
<b>8.5 Process vessel piping</b> .....	45
<b>8.6 Utility systems</b> .....	47
<b>8.7 Heating fluid and glycol systems</b> .....	48
<b>8.8 Pressure relief and disposal systems</b> .....	48
<b>8.9 Drain systems</b> .....	50

8.10	Bridge piping between platforms .....	50
8.11	Risers .....	50
8.12	Sampling valves .....	51
9	Considerations of related items .....	51
9.1	General .....	51
9.2	Layout .....	51
9.3	Elevations .....	51
9.4	Piping supports .....	51
9.5	Other corrosion considerations .....	51
9.6	Thermal insulation .....	54
9.7	Noise .....	56
9.8	Pipe, valves and fittings tables .....	56
9.9	Inspection, maintenance, repair and modification .....	56
10	Installation and quality control .....	56
10.1	General .....	56
10.2	Welding .....	56
10.3	Pressure testing .....	57
10.4	Test record .....	58
	Annex A (informative) Example problems .....	59
	Annex B (informative) Examples of pipe, valves and fittings tables .....	71
	Annex C (informative) Acceptable butt-welded joint design for unequal wall thicknesses .....	74
	Bibliography .....	76

## Foreword

The text of the International Standard ISO 13703:2000 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 CEN/TC 12 "Materials, equipment and offshore structures for petroleum 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 2001, and conflicting national standards shall be withdrawn at the latest by June 2001.

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

**NOTE FROM CMC:** The foreword is susceptible to be amended on reception of the German language version. The confirmed or amended foreword, and when appropriate, the normative annex ZA for the references to international publications with their relevant European publications will be circulated with the German version.

### Endorsement notice

The text of the International Standard ISO 13703:2000 was approved by CEN as a European Standard without any modification.

## Introduction

This International Standard is based on API RP 14E, 5<sup>th</sup> edition, October 1991.

## 1 Scope

This International Standard specifies minimum requirements and gives guidance for the design and installation of new piping systems on production platforms located offshore for the petroleum and natural gas industries. It covers piping systems up to 69 000 kPa (ga) maximum, within temperature range limits for the materials meeting the requirements of ASME B31.3.

NOTE For applications outside these pressure and temperature ranges, this International Standard may be used but special consideration should be given to material properties.

Annex A gives some worked examples for solving piping design problems.

## 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

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

API RP 520-2<sup>1)</sup>, *Recommended practice for design and installation of pressure-relieving systems in refineries — Part 2*.

ASME<sup>2)</sup>, *Boiler and pressure vessel code: Section VIII: Pressure vessels, Division 1*.

ASME B 31.3, *Process piping*.

NACE MR0175<sup>3)</sup>, *Sulfide stress cracking resistant metallic materials for oil field equipment*.

NACE TM0177, *Laboratory testing of metals for resistance to specific forms of environmental cracking in H<sub>2</sub>S environments*.

NACE TM0284, *Evaluation of pipeline and pressure vessel steels for resistance to hydrogen-induced cracking*.

---

1) American Petroleum Institute, 1220 L Street, N.W., Washington, DC 20005-4070, U.S.A.

2) American Society of Mechanical Engineers, 345 East 47<sup>th</sup> Street, New York, N.Y. 10017, U.S.A.

3) National Association of Corrosion Engineers, P.O. Box 218340, Houston, Texas 77218-8340, U.S.A.