Irish Standard
I.S. EN ISO 13704:2007&AC:2009

Petroleum, petrochemical and natural gas industries - Calculation of heater-tube thickness in petroleum refineries (ISO 13704:2007)

I.S. EN ISO 13704:2007&AC:2009

Incorporating amendments/corrigenda/National Annexes issued since publication:

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National Foreword

I.S. EN ISO 13704:2007&AC:2009 is the adopted Irish version of the European Document EN ISO 13704:2007, Petroleum, petrochemical and natural gas industries - Calculation of heater-tube thickness in petroleum refineries (ISO 13704:2007)

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In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 13704:2007/AC

April 2009
Avril 2009
April 2009

ICS 75.180.20

English version
Version Française
Deutsche Fassung

Petroleum, petrochemical and natural gas industries - Calculation of heater-tube thickness in petroleum refineries (ISO 13704:2007/Cor 1:2008)

Industries du pétrole, de la pétrochimie et du gaz naturel - Calcul de l'épaisseur des tubes de fours de raffineries de pétrole (ISO 13704:2007/Cor 1:2008)

Erdöl- und Erdgasindustrie - Berechnung der Wanddicke von Heizrohren in Erdölraffinerien (ISO 13704:2007/Cor 1:2008)

This corrigendum becomes effective on 29 April 2009 for incorporation in the three official language versions of the EN.

Ce corrigendum prendra effet le 29 avril 2009 pour incorporation dans les trois versions linguistiques officielles de la EN.

Die Berichtigung tritt am 29.April 2009 zur Einarbeitung in die drei offiziellen Sprachfassungen der EN in Kraft.

EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Endorsement notice

The text of ISO 13704:2007/Cor.1:2008 has been approved by CEN as a European Corrigendum without any modification.

INTERNATIONAL STANDARD ISO 13704:2007
TECHNICAL CORRIGENDUM 1

Published 2008-06-15

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

Petroleum, petrochemical and natural gas industries — Calculation of heater-tube thickness in petroleum refineries

TECHNICAL CORRIGENDUM 1

Industries du pétrole, de la pétrochimie et du gaz naturel — Calcul de l'épaisseur des tubes de fours de raffineries de pétrole

RECTIFICATIF TECHNIQUE 1

Technical Corrigendum 1 to ISO 13704:2007 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems*.

Page 61, Figure E.11:

Replace term on the horizontal axis in the upper right-hand corner with the following:

$$(T_d + 273)\,(30 + \lg t_{DL}) \times 10^{-3}$$

Pages 62 to 69, Figures E.12 to E.19:

Replace term on the horizontal axis in the upper right-hand corner with the following:

$$(T_d + 273)\,(15 + \lg t_{DL}) \times 10^{-3}$$

Page 81, Figure F.11:

Replace term on the horizontal axis in the upper right-hand corner with the following:

$$(T_d + 460)\,(30 + \lg t_{DL}) \times 10^{-3}$$

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Published in Switzerland

ISO 13704:2007/Cor.1:2008(E)

Pages 82 to 89, Figures F.12 through F.19

Replace term on the horizontal axis in the upper right-hand corner with the following:

$$(T_d + 460)\,(15 + \lg t_{DL}) \times 10^{-3}$$

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 13704

November 2007

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English Version

Petroleum, petrochemical and natural gas industries - Calculation of heater-tube thickness in petroleum refineries (ISO 13704:2007)

Industries du pétrole, de la pétrochimie et du gaz naturel - Calcul de l'épaisseur des tubes de fours de raffineries de pétrole (ISO 13704:2007)

Erdöl- und Erdgasindustrie - Berechnung der Wanddicke von Heizrohren in Erdölraffinerien (ISO 13704:2007)

This European Standard was approved by CEN on 3 November 2007.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN ISO 13704:2007: E

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Foreword

This document (EN ISO 13704:2007) 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, 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 May 2008, and conflicting national standards shall be withdrawn at the latest by May 2008.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 13704:2007 has been approved by CEN as a EN ISO 13704:2007 without any modification.

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INTERNATIONAL STANDARD

ISO 13704

Second edition
2007-11-15

Petroleum, petrochemical and natural gas industries — Calculation of heater-tube thickness in petroleum refineries

Industries du pétrole, de la pétrochimie et du gaz naturel — Calcul de l'épaisseur des tubes de fours de raffineries de pétrole

Reference number
ISO 13704:2007(E)

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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.

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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.

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ISO 13704 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 6, *Processing equipment and systems*.

This second edition cancels and replaces the first edition (ISO 13704:2001), which has been technically revised.

Petroleum, petrochemical and natural gas industries — Calculation of heater-tube thickness in petroleum refineries

1 Scope

This International Standard specifies the requirements and gives recommendations for the procedures and design criteria used for calculating the required wall thickness of new tubes and associated component fittings for petroleum-refinery heaters. These procedures are appropriate for designing tubes for service in both corrosive and non-corrosive applications. These procedures have been developed specifically for the design of refinery and related process-fired heater tubes (direct-fired, heat-absorbing tubes within enclosures). These procedures are not intended to be used for the design of external piping.

This International Standard does not give recommendations for tube retirement thickness; Annex A describes a technique for estimating the life remaining for a heater tube.

2 Terms and definitions

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

2.1
actual inside diameter
D_i
inside diameter of a new tube

NOTE The actual inside diameter is used to calculate the tube skin temperature in Annex B and the thermal stress in Annex C.

2.2
component fitting
fitting connected to the fired heater tubes

EXAMPLES Return bends, elbows, reducers.

NOTE 1 There is a distinction between standard component fittings and specially designed component fittings; see 4.9.

NOTE 2 Typical material specifications for standard component fittings are ASTM A 234, ASTM A 403 and ASTM B 366.

2.3
corrosion allowance
δ_{CA}
additional material thickness added to allow for material loss during the design life of the component

2.4
design life
t_{DL}
operating time used as a basis for tube design

NOTE The design life is not necessarily the same as the retirement or replacement life.