

DIN EN ISO 15547-1

ICS 71.120.30

Mit
DIN EN ISO 15547-2:2006-02
Ersatz für
DIN EN ISO 15547:2003-09

**Erdöl-, petrochemische und Erdgasindustrie –
Plattenwärmetauscher –****Teil 1: Plattenwärmeaustauscher (ISO 15547-1:2005);
Englische Fassung EN ISO 15547-1:2005**

Petroleum, petrochemical and natural gas industries –
Plate-type heat exchangers –
Part 1: Plate-and-frame heat exchangers (ISO 15547-1:2005);
English version EN ISO 15547-1:2005

Industries du pétrole, de la pétrochimie et du gaz naturel –
Echangeurs thermiques à plaques –
Partie 1: Echangeurs thermiques à plaques et cadre (ISO 15547-1:2005);
Version anglaise EN ISO 15547-1:2005

Gesamtumfang 31 Seiten

Normenausschuss Erdöl- und Erdgasgewinnung (NÖG) im DIN
Normenausschuss Maschinenbau (NAM) im DIN

Nationales Vorwort

Diese Europäische Norm wurde vom Technischen Komitee CEN/TC 12 „Materialien, Ausrüstungen und Offshore-Bauwerke für die Erdöl-, petrochemische- und Erdgasindustrie“ (Sekretariat: Frankreich) erstellt. Es handelt sich dabei um die unveränderte Übernahme von ISO 15547-1:2005, erarbeitet vom ISO/TC 67 „Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries“, Subkomitee SC 6 „Processing equipment and systems“ (Sekretariat: Frankreich), zu welchem die fachliche nationale Zuarbeit beim NAM im DIN liegt.

Diese Europäische Norm enthält unter Berücksichtigung des DIN-Präsidialbeschlusses 13/1983 nur die englische Originalfassung der ISO-Norm.

Änderungen

Gegenüber DIN EN ISO 15547:2003-09 wurden folgende Änderungen vorgenommen:

- a) die Norm wurde in die Teile 1 und 2 aufgeteilt;
- b) aus diesem Teil 1, der im Grundsatz dem Inhalt der Fassung 2003-09 von DIN EN ISO 15147 entspricht, wurde der Abschnitt über die „Vorabklärung strittiger Anforderungen vor Fertigung der Wärmeaustauscher“ gestrichen;
- c) die Angaben hinsichtlich der Kennzeichnung der Wärmeaustauscher erfolgen künftig auf den Typenschildern; es ist keine Stempelung mehr direkt auf dem Produkt vorgesehen;
- d) der Anhang A wurde hinsichtlich von Verweisungen redaktionell an API RP 662 angeglichen.

Frühere Ausgaben

DIN EN ISO 15547: 2003-09

English Version

Petroleum, petrochemical and natural gas industries – Plate-type
heat exchangers – Part 1: Plate-and-frame heat exchangers
(ISO 15547-1:2005)

Industries du pétrole, de la pétrochimie et du gaz naturel –
Echangeurs thermiques à plaques – Partie 1: Echangeurs
thermiques à plaques et cadre (ISO 15547-1:2005)

Erdöl-, petrochemische und Erdgasindustrie –
Plattenwärmetauscher – Teil 1: Plattenwärmetauscher
(ISO 15547-1:2005)

This European Standard was approved by CEN on 28 October 2005.

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.



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

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

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Foreword

This document (EN ISO 15547-1:2005) 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 2006, and conflicting national standards shall be withdrawn at the latest by May 2006.

This document supersedes EN ISO 15547:2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, 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.

Endorsement notice

The text of ISO 15547-1:2005 has been approved by CEN as EN ISO 15547-1:2005 without any modifications.

Introduction

Users of this part of ISO 15547 should be aware that further or differing requirements may be needed for individual applications. This part of ISO 15547 is not intended to inhibit a vendor from offering, or the purchaser from accepting, alternative equipment or engineering solutions for the individual application. This may be particularly applicable where there is an innovative or developing technology. Where an alternative is offered, the vendor should identify any variations from this part of ISO 15547 and provide details.

This part of ISO 15547 requires the purchaser to specify certain details and features.

A bullet (●) at the beginning of a clause or subclause indicates a requirement for the purchaser to make a decision or provide information (for information, a checklist is provided in Annex B).

In this part of ISO 15547, where practical, US Customary units are included in parentheses for information.

1 Scope

This part of ISO 15547 gives requirements and recommendations for the mechanical design, materials selection, fabrication, inspection, testing, and preparation for shipment of plate-and-frame heat exchangers for use in petroleum, petrochemical and natural gas industries. It is applicable to gasketed, semi-welded and welded plate-and-frame heat exchangers.

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 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*

3 Terms and definitions

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

3.1

drip tray

tray that is able to collect droplets from an entire heat exchanger plate pack

3.2

end plate

plate which prevent the fluids in a plate-and-frame heat exchanger from contacting the fixed and removable covers

NOTE There are two end plates, one at each end of the plate-and-frame heat exchanger.

3.3

frame

assembly that provides the structural support and pressure containment of a plate-and-frame heat exchanger

3.4**welded plate pack**

plate pack where the gaskets have been replaced by welds

3.5**heat transfer area**

sum of the surface areas of one side of all plates in contact with both heat-transfer fluids

NOTE Areas of end plates are not included.

3.6**item number**

purchaser's identification number for a plate-and-frame heat exchanger

3.7**minimum design metal temperature**

lowest metal temperature at which pressure-containing elements can be subjected to design pressure

EXAMPLE Ambient temperature, process fluid temperature.

3.8**pass plate**

plate used to change the direction of flow of a stream in a plate-and-frame heat exchanger with two or more passes

3.9**plate**

sheet of material precision-pressed or -formed into a corrugated pattern

3.10**plate chevron angle**

angle formed between the corrugated plate pattern and the horizontal

3.11**plate-and-frame heat exchanger**

assembly of a gasketed, semi-welded or welded plate pack and its supporting frame

See Figure 1.

3.12**plate gap**

b

height to the underside of a corrugation of a plate

See Figure 2.

3.13**plate pack**

grouping of all plates contained within a frame

3.14**port**

inlet or outlet opening in the plate

3.15**pressure design code**

recognized pressure vessel standard specified or agreed by the purchaser

EXAMPLE ASME Section VIII, EN 13445.

3.16

semi-welded plate pair

two adjacent plates welded together where the weld replaces the function of a gasket

NOTE Gaskets are used to seal adjacent semi-welded plate pairs

3.17

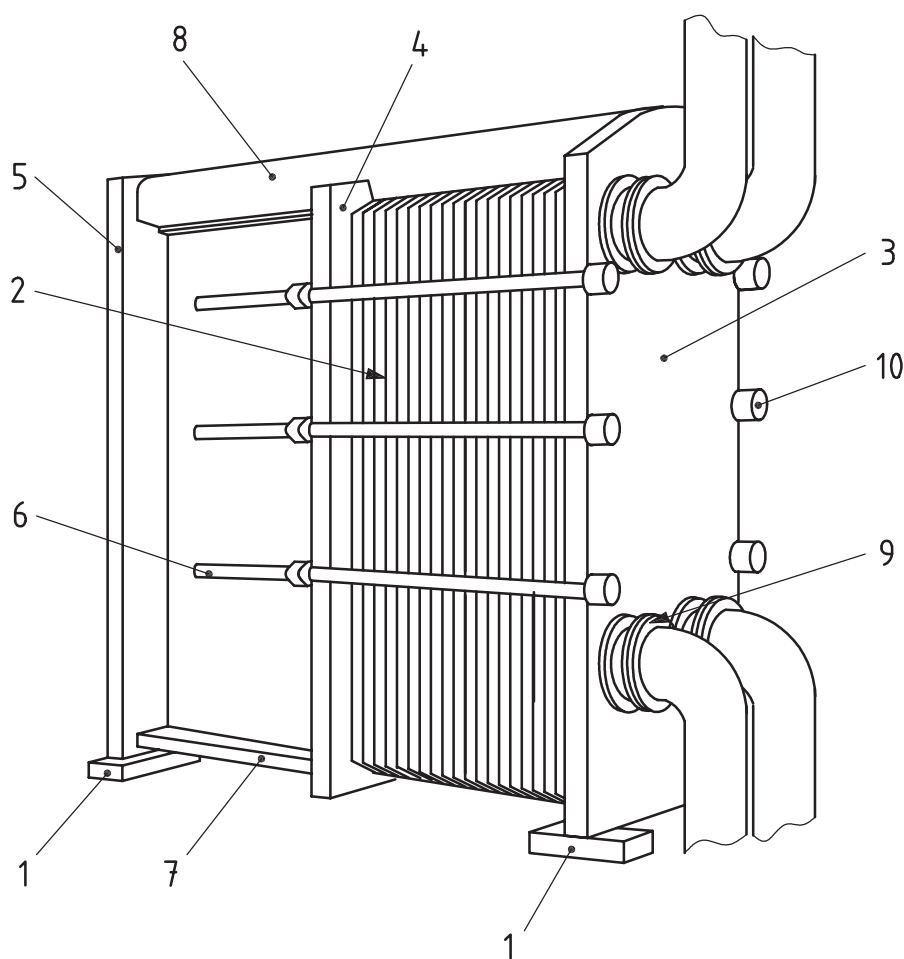
shroud

removable covering for the top and sides of the plate pack of the plate-and-frame heat exchanger, which provides protection in the event of a spray leak or fire

3.18

structural welding code

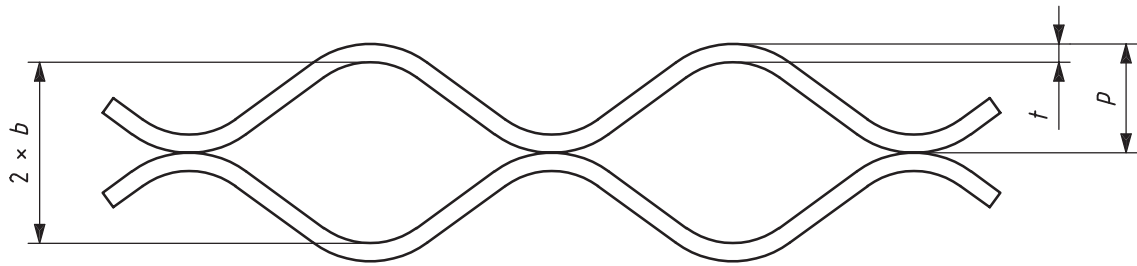
recognized structural welding code specified or agreed by the purchaser



Key

- | | |
|------------------|-----------------------------------|
| 1 mounting feet | 6 tie bolts |
| 2 plate pack | 7 guide bar (bottom) |
| 3 fixed cover | 8 carrying bar (top) |
| 4 movable cover | 9 connections, studded or flanged |
| 5 support column | 10 tie nuts |

Figure 1 — Typical single-pass plate-and-frame heat exchanger



$$b = p - t$$

Key

- b plate gap
- t plate thickness
- p compressed pitch per plate

Figure 2 — Plate gap

4 General

- **4.1** The pressure design code shall be specified or agreed by the purchaser. Pressure components (i.e. covers, tie bolts, tie nuts and connections) shall comply with the pressure design code and the supplemental requirements in this part of ISO 15547.

The structural welding code shall be specified or agreed by the purchaser.

Annex A provides some recommended mechanical and design details for information. Annex A also includes some precautions for consideration when specifying fouling margin, fireproof shrouds and plate gaskets.

- **4.2** The vendor shall comply with the applicable local regulations specified by the purchaser.

5 Proposal information required

5.1 The vendor shall complete all information requested on the data sheet. Annex C provides suitable formats.

5.2 For components whose terms and definitions are not fully identified by Clause 3, the vendor shall describe the details of construction and assembly.

5.3 The vendor shall include a detailed description of any exception to the specified requirements.

5.4 The first-time use of a plate-and-frame heat exchanger design, component or material by the vendor for the purchaser's intended service shall be clearly indicated by the vendor.

5.5 The vendor shall state the anticipated life of the proposed gaskets in the specified service and in storage. Special requirements for gasket storage to maintain gasket shelf-life shall be specified.

5.6 The vendor shall state the method of support used for the movable cover.

5.7 The vendor shall supply a recommended spare parts list for each plate-and-frame heat exchanger.

5.8 If a fireproof shroud is specified, the plate-and-frame heat exchanger vendor shall submit proof that the proposed design has passed suitable type testing.

6 Drawings and other data requirements

6.1 Drawings

6.1.1 The vendor shall submit general arrangement drawings for each plate-and-frame heat exchanger for review. The drawings shall include the following information:

- a) service, item number, project name and location, vendor's shop order number and purchaser's order number;
- b) design pressure, test pressure, maximum design temperature, minimum design metal temperature and any restrictions regarding testing or operation of the plate-and-frame heat exchanger;
- c) dimensions and location of supports;
- d) overall exchanger dimensions;
- e) maximum and minimum compressed plate pack length;
- f) side clearance required for plate removal;
- g) mass of the plate-and-frame heat exchanger, both empty and full of water;
- h) centre of gravity of the exchanger for empty and operating conditions;
- i) corrosion allowance;
- j) material specifications for all components;
- k) allowable forces and moments on connections;
- l) size, flange rating and facing, location, orientation, and flow identification of all connections;
- m) applicable design codes;
- n) number of plates installed and maximum number of plates for specified frame;
- o) gasket materials and attachment method (e.g. glued, clip-on, etc.).

6.1.2 The vendor shall recommend the tools needed for the assembly and maintenance of the plate-and-frame heat exchanger. If torquing of bolts is required, the vendor shall provide torquing procedures.

6.1.3 The review of general configuration drawings by the purchaser shall not relieve the vendor of the responsibility of meeting the requirements of the purchase order.

6.1.4 After receipt of the purchaser's general arrangement drawing review comments, the vendor shall furnish the certified general configuration drawings and the detail drawings.

- **6.1.5** If specified by the purchaser, the vendor shall furnish copies of applicable welding procedure specifications and weld map for review or record.
- **6.1.6** If specified by the purchaser, the vendor shall furnish copies of applicable calculations for review or record.