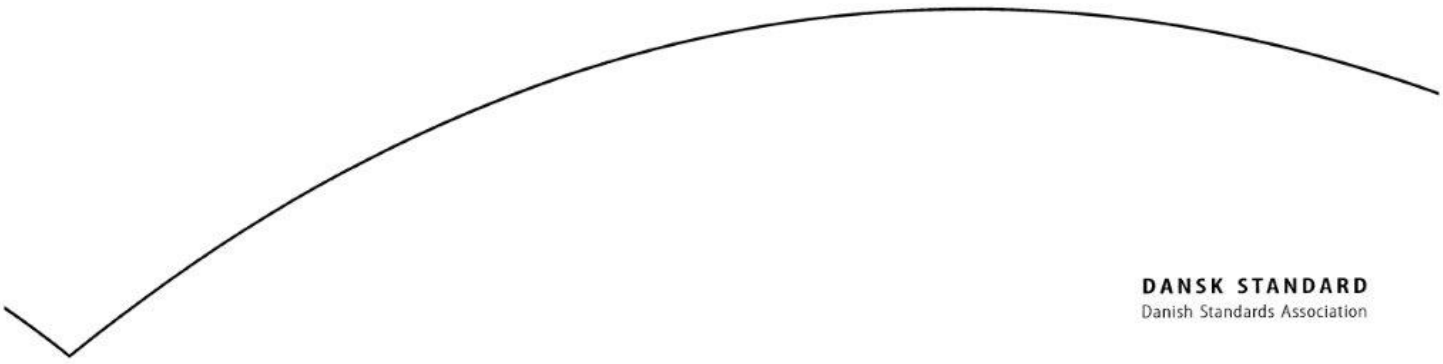
2017-09-04

Ufyrede trykbeholdere – Del 3: Konstruktion

Unfired pressure vessels – Part 3: Design



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IDT med: EN 13445-3:2014.

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Denne publikation erstatter: DS/EN 13445-3:2014/Issue 3:2016, DS/EN 13445-3:2014/A2:2016.

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EUROPÄISCHE NORM

September 2014

ICS 23.020.30

Supersedes EN 13445-3:2009

English Version

Unfired pressure vessels - Part 3: Design

Récipients sous pression - Partie 3: Conception

Unbefeuerte Druckbehälter - Teil 3: Konstruktion

This European Standard was approved by CEN on 19 August 2014.

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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.

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

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Ref. No. EN 13445-3:2014 E

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Foreword

This document (EN 13445-3:2014) has been prepared by Technical Committee CEN/TC 54 “Unfired pressure vessels”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by December 2014, and conflicting national standards shall be withdrawn at the latest by December 2014.

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.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative annex ZA, which is an integral part of this document.

This European Standard consists of the following Parts:

— Part 1: *General*.

— Part 2: *Materials*.

— Part 3: *Design*.

— Part 4: *Fabrication*.

— Part 5: *Inspection and testing*.

— Part 6: *Requirements for the design and fabrication of pressure vessels and pressure parts constructed from spheroidal graphite cast iron*.

— CR 13445-7, *Unfired pressure vessels — Part 7: Guidance on the use of conformity assessment procedures*.

— Part 8: *Additional requirements for pressure vessels of aluminium and aluminium alloys.*

— CEN/TR 13445-9, *Unfired pressure vessels — Part 9: Conformance of EN 13445 series to ISO 16528*

Although these Parts may be obtained separately, it should be recognised that the Parts are inter-dependant. As such the manufacture of unfired pressure vessels requires the application of all the relevant Parts in order for the requirements of the Standard to be satisfactorily fulfilled.

Corrections to the standard interpretations where several options seem possible are conducted through the Migration Help Desk (MHD). Information related to the Help Desk can be found at http://www.unm.fr (en13445@unm.fr). A form for submitting questions can be downloaded from the link to the MHD website. After subject experts have agreed an answer, the answer will be communicated to the questioner. Corrected pages will be given specific issue number and issued by CEN according to CEN Rules. Interpretation sheets will be posted on the website of the MHD.

This document supersedes EN 13445-3:2009. This new edition incorporates the Amendments which have been approved previously by CEN members, and the corrected pages up to Issue 5 without any further technical change. Annex Y provides details of significant technical changes between this European Standard and the previous edition.

Amendments to this new edition may be issued from time to time and then used immediately as alternatives to rules contained herein. It is intended to deliver a new Issue of EN 13445:2014 each year, consolidating these Amendments and including other identified corrections. . Issue 4 (2017-07) includes the corrected pages listed in Annex Y.

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.

1 Scope

This Part of this European Standard specifies requirements for the design of unfired pressure vessels covered by EN 13445-1:2014 and constructed of steels in accordance with EN 13445-2:2014.

EN 13445-5:2014, Annex C specifies requirements for the design of access and inspection openings, closing mechanisms and special locking elements.

NOTE This Part applies to design of vessels before putting into service. It may be used for in service calculation or analysis subject to appropriate adjustment.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 286-2:1992, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 2: Pressure vessels for air braking and auxiliary systems for motor vehicles and their trailers*

EN 764-1:2004, *Pressure equipment — Terminology — Part 1: Pressure, temperature, volume, nominal size*

EN 764-2:2012, *Pressure equipment — Part 2: Quantities, symbols and units*

EN 764-3:2002, *Pressure equipment — Part 3: Definition of parties involved*

EN 837-1:1996, *Pressure gauges — Part 1: Bourdon tube pressure gauges — Dimensions, metrology, requirements and testing*

EN 837-3:1996, *Pressure gauges — Part 3: Diaphragm and capsule pressure gauges — Dimensions, metrology, requirements and testing*

EN 1092-1:2007, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN-designated — Part 1: Steel flanges*

EN 1591-1:2011, *Flanges and their joints — Design rules for gasketed circular flange connections — Calculation method*

EN 1708-1:2010, *Welding — Basic weld joint details in steel — Part 1: Pressurized components*

EN 1990, *Eurocode — Basis of structural design*

EN 1992-1-1:2005, *Eurocode 2 — Design of concrete structures — Part 1-1: General rules and rules for buildings*

EN 1991-1-4:2005, *Eurocode 1: Actions on structures — Part 1-4: General actions — Wind actions*

EN 1991-1-6, *Eurocode 1 — Actions on structures — Part 1-6: General actions — Actions during execution*

EN 1998-1:2004, *Design of structures for earthquake resistance — Part 1: General rules, seismic actions and rules for buildings*

EN 10222-1:1998, EN 10222-1:1998/A1:2002, *Steel forgings for pressure purposes — Part 1: General requirements for open die forgings*

EN 13445-1:2014, *Unfired pressure vessels — Part 1: General*

EN 13445-2:2014, *Unfired pressure vessels — Part 2: Materials*

EN 13445-4:2014, *Unfired pressure vessels — Part 4: Fabrication*

EN 13445-5:2014, *Unfired pressure vessels — Part 5: Inspection and testing*

EN 13445-8:2014, *Unfired pressure vessels — Part 8: Additional requirements for pressure vessels of aluminium and aluminium alloys*

EN ISO 4014:2011, *Hexagon head bolts — Product grades A and B* (ISO 4014:2011)

EN ISO 4016:2011, *Hexagon head bolts — Product grade C* (ISO 4016:2011)

EN ISO 15613:2004, *Specification and qualification of welding procedures for metallic materials — Qualification based on pre-production welding test*

ISO 261:1998, *ISO general purpose metric threads — General plan*

3 Terms and definitions

For the purposes of this Part of this European Standard, the terms and definitions given in EN 13445-1:2014, EN 13445-2:2014 and the following apply:

NOTE EN 13445-1:2014 and EN 13445-2:2014 have adopted terminology, symbols and definitions of EN 764-1:2004, EN 764-2:2012 and EN 764-3:2002.

3.1
action
imposed thermo-mechanical influence which causes stress and/or strain in a structure, e.g. an imposed pressure, force, temperature

3.2
analysis thickness
effective thickness available to resist the loading depending on the load case, see 5.3.2

3.3
assumed thickness
thickness assumed by the designer between the minimum required shell thickness e and the shell analysis thickness e_a

3.4
calculation pressure
differential pressure used for the purpose of the design calculations for a component
[EN 764-1:2004]

3.5
calculation temperature
temperature used for the purpose of the design calculations for a component
[EN 764-1:2004]

3.6
chamber
fluid space within a unit of pressure equipment
[EN 764-1:2004]

3.7
component
part of pressure equipment which can be considered as an individual item for the calculation
[EN 764-1:2004]