Norma Española

UNE-EN 13445-3:2014/A8:2019

Idioma: Inglés

Recipientes a presión no sometidos a llama. Parte 3: Diseño. (Ratificada por la Asociación Española de Normalización en septiembre de 2019.)

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Recipientes a presión no sometidos a llama. Parte 3: Diseño. (Ratificada por la Asociación Española de Normalización en septiembre de 2019.)

Unfired pressure vessels - Part 3: Design (Endorsed by Asociación Española de Normalización in September of 2019.)

Récipients sous pression non soumis à la flamme - Partie 3 : Conception (Entérinée par l'Asociación Española de Normalización en septembre 2019.)

En cumplimiento del punto 11.2.5.4 de las Reglas Internas de CEN/CENELEC Parte 2, se ha otorgado el rango de documento normativo español UNE al documento normativo europeo EN 13445-3:2014/A8:2019 (Fecha de disponibilidad 2019-04-03)

Este documento está disponible en los idiomas oficiales de CEN/CENELEC/ETSI.

Este anuncio causará efecto a partir del primer día del mes siguiente al de su publicación en la revista UNE.

La correspondiente versión oficial de este documento se encuentra disponible en la Asociación Española de Normalización (Génova 6 28004 MADRID, www.une.org).

Las observaciones a este documento han de dirigirse a:

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 13445-3:2014/A8

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English Version

Unfired pressure vessels - Part 3: Design

Récipients sous pression non soumis à la flamme - Partie 3 : Conception

Unbefeuerte Druckbehälter - Teil 3: Konstruktion

This amendment A8 modifies the European Standard EN 13445-3:2014; it was approved by CEN on 19 November 2018.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This amendment 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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European foreword

This document (EN 13445-3:2014/A8:2019) 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 October 2019, and conflicting national standards shall be withdrawn at the latest by October 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN 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 EN 13445-3:2014.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Modifications to Clause 2, Normative references

Add a footnote number "[1]" *after the reference* "EN 1991-1-4:2005" *and the corresponding footnote at the bottom of the page:*

"[1] EN 1991-1-4:2005 is impacted by the stand-alone amendment EN 1991-1-4:2005/A1:2010 and the corrigendum EN 1991-1-4:2005/AC:2010.".

In the reference to EN 1991-1-6, replace "EN 1991-1-6" *with* "EN 1991-1-6:2005".

Add the following new reference at the appropriate place:

"EN 12195-1:2010, *Load restraining on road vehicles — Safety — Part 1: Calculation of securing forces*".

2 Modification to 5.3.1, Actions

Add the following note at the end of the subclause:

"

NOTE The combination of actions is given in 5.3.2.4.".

3 Addition of a new Subclause 5.3.2.4, Load combinations

Insert the following new subclause:

"

5.3.2.4 Load combinations

5.3.2.4.1 General

Load combinations of non-pressure loads in Table 5.3.2.4-1 are used in connection with calculations according to Clause 16 and Annex C (linear elastic behaviour). The basic calculation of pressure envelope by design pressures and temperatures shall be made before Clause 16 (or Annex C) calculations. The load combinations in Table 5.3.2.4-1 are minimum to be taken into account, if they are relevant. There may also be other loads.

5.3.2.4.2 Specific definitions

5.3.2.4.2.1 Dead loads

Maximum dead load (G_{max}) is the weight of the whole un-corroded vessel with all internals (trays, packing, etc.), attachments, insulation, fire protection, piping, platforms and ladders.

Corroded dead load (G_{corr}) is defined as G_{max} but with the weight of the corroded vessel.

Minimum dead load (G_{min}) is the weight of the un-corroded vessel during the installation phase, excluding the weight of items not already mounted on the vessel before erection (e.g. removable internals, platforms, ladders, attached piping, insulation and fire protection).

NOTE A scaffold is normally self-supported. In this case, the weight of the scaffold is not included in the vessel weight.

Transport dead load (G_{trans}) is the case, when vessel has the removable internals and insulation already mounted on the vessel in the workshop.

5.3.2.4.2.2 Live loads

Live loads (L) used in this clause are weight loads of the contents (fluids or solids in the bottom of the vessel, on trays and in packing) and traffic loads on platforms and ladders by personnel and machinery.

5.3.2.4.2.3 Wind loads

Wind loads (W) are horizontal global pressure loads caused by wind and acting on the projected area of the vessel and its attachments, as influenced by the force coefficients (see 22.4.4).

5.3.2.4.2.4 Earthquake loads

Earthquake loads (E) are quasi-static horizontal forces on the vessel sections caused by seismic accelerations at the base of vessel calculated by the "lateral force method of analysis" (see 22.4.5).

5.3.2.4.2.5 Forces from attached external piping

Reaction forces from attached external piping are forces resulting from weight (G), wind (W), earthquake (E) and other additional forces (F) as far as they influence the global equilibrium of the vessel (see 22.4.6 for columns).

NOTE Forces and moments on nozzles and supports on the vessel caused by attached external piping can act as internal and/or external loads. Internal loads are those that cause local loads only and have no influence on the global equilibrium because they are self-compensating. Furthermore, attached pipes can either load the vessel or restrain it depending on their layout. Consideration of these aspects is given in the recommendations in 22.4.6.

5.3.2.4.3 Specific symbols and abbreviations

The following specific symbols and abbreviations are used in Table 5.3.2.4-1 in addition to those in Clause 4:

E earthquake load (see 5.3.2.4.2.4)

F additional loads from piping (thermal expansion loads) (see 5.3.2.4.2.5)

$f_{B,op}$ nominal design stress for operation conditions for anchor bolts, see Formula (6.7–1)

G_{min} minimum dead loads (see 5.3.2.4.2.1)

G_{max} maximum dead loads (see 5.3.2.4.2.1)

G_{corr} corroded dead loads (see 5.3.2.4.2.1)

G_{trans} transport dead loads (see 5.3.2.4.2.1)

L live loads of each loading case (contents, etc.) (see 5.3.2.4.2.2)

P_i internal calculation pressure as defined in 5.3.10 for $P > 0$ (including hydrostatic pressure)

P_e external calculation pressure as defined in 5.3.10 for $P < 0$ (e.g. vacuum)

W wind load (Clause 22 and EN 1991-1-4)

$\sigma_{c,all}$ maximum allowable compressive stress for operation conditions in accordance with 16.14.8, with σ_e as defined in 8.4 and with a safety factor of 1,5 in Formula (16.14–29)

$\sigma_{c,all,test}$ maximum allowable compressive stress for test conditions in accordance with 16.14.8, with σ_e as defined in 8.4 and with safety factor 1,05 in Formula (16.14–29)

& operator which means: superposition of the different load types for the axial and lateral forces, the bending moments and the resulting shear and longitudinal stresses using the beam theory for non-pressure loads and the membrane theory for pressure loads