



NSAI
Standards

Irish Standard
I.S. EN 13445-6:2014

Unfired pressure vessels - Part 6:
Requirements for the design and fabrication
of pressure vessels and pressure parts
constructed from spheroidal graphite cast
iron

I.S. EN 13445-6:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

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I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

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National Foreword

I.S. EN 13445-6:2014 is the adopted Irish version of the European Document EN 13445-6:2014, Unfired pressure vessels - Part 6: Requirements for the design and fabrication of pressure vessels and pressure parts constructed from spheroidal graphite cast iron

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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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EUROPÄISCHES KOMITEE FÜR NORMUNG

Correction Notice

EN 13445:2014

Title: Unfired pressure vessels

Brussels, 2015-07-29

With reference to the above, please include the following minor editorial correction(s) in the document :

for the following procedure :

- Enquiry
- Parallel Enquiry (ISO/ CEN Lead)
- Formal Vote
- Parallel Formal Vote (ISO/ CEN Lead)
- UAP
- Comments before voting meeting (ENV)
- 2-year Enquiry (ENV)
- COCOR Vote
- Publication
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In line with resolution **BT 64/2007** and in co-operation with the **Migration Help Desk**, please note that corrections have been brought to some pages of the documents as listed below.

The following pages have been corrected:

EN 13445-1:2014 – WI 00054139 - Part 1: General		
English	French	German
4 - 5 - 6 - 22 - 36 - 37 - 37a to 37c - 38	4 - 5 - 6 - 22 - 36 - 37 - 37a à 37c - 38	4 - 5 - 6 - 22 - 36 - 37 - 37a bis - 37c - 38
EN 13445-2:2014 – WI 00054140 - Part 2: Materials		
English	French	German
5 - 7 - 11 - 17 - 21 - 22 - 23 - 24 - 25 - 58 - 59 - 60 - 61 - 62 - 63 - 64 - 65 - 66 - 67 - 68 - 69 - 70 - 71 - 72 - 73 - 74 - 75 - 76 - 77 - 78 - 79 - 80 - 81	5 - 7 - 11 - 17 - 21 - 22 - 23 - 24 - 25 - 58 - 59 - 60 - 61 - 62 - 63 - 64 - 65 - 66 - 67 - 68 - 69 - 70 - 71 - 72 - 73 - 74 - 75 - 76 - 77 - 78 - 79 - 80 - 81	5 - 7 - 11 - 17 - 21 - 22 - 23 - 24 - 25 - 58 - 59 - 60 - 61 - 62 - 63 - 64 - 65 - 66 - 67 - 68 - 69 - 70 - 71 - 72 - 73 - 74 - 75 - 76 - 77 - 78 - 79 - 80 - 81
EN 13445-3:2014 – WI 00054138 - Part 3: Design		
English	French	German
7 - 102 - 142 - 185 - 614 - 628 - 632a to 632b - 864	7 - 102 - 142 - 185 - 549 - 614 - 628 - 631 - 632a à 632b - 696 - 815 - 864	7 - 102 - 142 - 185 - 405 - 460 - 614 - 628 - 632a bis 632b - 864
EN 13445-4:2014 – WI 00054141 - Part 4: Fabrication		
English	French	German
6 - 67	6 - 67	6 - 67
EN 13445-5:2014 – WI 00054135 - Part 5: Inspection and testing		
English	French	German
6 - 23 - 24 - 77	6 - 23 - 24 - 77	6 - 19 - 23 - 24 - 77
EN 13445-6:2014 – WI 00054136 - Part 6: Requirements for the design and fabrication of pressure vessels and pressure parts constructed from spheroidal graphite cast iron		
English	French	German
6 - 53	6 - 53	6 - 53
EN 13445-8:2014 – WI 00054137 - Part 8: Additional requirements for pressure vessels of aluminium and aluminium alloys		
English	French	German
2 - 3 - 5 - 6 - 6a - 7 - 8 - 9 - 10 - 11 - 11a - 12 - 12a - 13 - 14 - 15 - 16 - 19 - 20 - 21 - 24a to 24f - 25 - 26 - 27	2 - 3 - 5 - 6 - 6a - 7 - 8 - 9 - 10 - 11 - 11a - 12 - 12a - 13 - 14 - 15 - 16 - 19 - 20 - 21 - 24a à 24f - 25 - 26 - 27	2 - 3 - 5 - 6 - 6a - 7 - 8 - 9 - 10 - 11 - 11a - 12 - 12a - 13 - 14 - 15 - 16 - 19 - 20 - 21 - 24a bis 24f - 25 - 26 - 27

EUROPEAN STANDARD

EN 13445-6

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2014

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Supersedes EN 13445-6:2009

English Version

Unfired pressure vessels - Part 6: Requirements for the design and fabrication of pressure vessels and pressure parts constructed from spheroidal graphite cast iron

Réceptifs sous pression non soumis à la flamme - Partie 6:
Exigences pour la conception et la fabrication des réceptifs
sous pression et des parties sous pression moulés en fonte
à graphite sphéroïdal

Unbefeuerte Druckbehälter - Teil 6: Anforderungen an die
Konstruktion und Herstellung von Druckbehältern und
Druckbehälterteilen aus Gusseisen mit Kugelgraphit

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

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 CEN-CENELEC Management Centre or to any CEN member.

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COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 13445-6:2014) 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: *Testing and Inspection*
- 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: *Requirements for the design and fabrication of pressure vessels and pressure parts constructed from spheroidal graphite cast iron.*
- 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 13445-6:2009. 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.

EN 13445-6:2014 (E)
Issue 2 (2015-07)

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 2 (2015-07) 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 European Standard specifies requirements for the design, materials, manufacturing and testing of pressure vessels and pressure vessel parts intended for use with a maximum allowable pressure, PS, equal or less than 100 bar and shell wall thicknesses not exceeding 60 mm, which are constructed of ferritic or austenitic spheroidal graphite cast iron. The thickness limitation of the shell does not apply to thickness of flanges, reinforcements, bosses etc.

The allowable grades do not include lamellar graphite cast iron grades for ferritic and austenitic grades, which are explicitly excluded from this European Standard because of low elongation and brittle material behaviour, which requires the use of different safety factors and a different approach.

NOTE 1 Austenitic spheroidal graphite cast iron grades are principally used for high and low temperature applications and for their corrosion resistance properties.

NOTE 2 The allowable grades of spheroidal graphite cast iron are listed in Tables 3 and Tables 4. Service conditions are given in Clause 4.

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

EN 764-5:2002, *Pressure equipment — Part 5: Compliance and inspection documentation of materials*

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 1369:2012, *Founding — Magnetic particle testing*

EN 1370:2011, *Founding — Examination of surface condition*

EN 1371-1:2011, *Founding — Liquid penetrant testing — Part 1: Sand, gravity die and low pressure die castings*

EN 1559-1:2011, *Founding — Technical conditions of delivery — Part 1: General*

EN 1559-3:2011, *Founding — Technical conditions of delivery — Part 3: Additional requirements for iron castings*

EN 1563:1997, EN 1563:1997/A1:2002, EN 1563:1997/A2:2005, *Founding — Spheroidal graphite cast irons*

EN 12680-3:2011, *Founding — Ultrasonic testing — Part 3: Spheroidal graphite cast iron castings.*

EN 12681:2003, *Founding — Radiographic examination*

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

EN 13445-3:2014, *Unfired pressure vessels — Part 3: Design*

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

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