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SIST EN 13445-3:2002/A11:2007

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ICS 23.020.30

English Version

## Unfired pressure vessels - Part 3: Design

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

Unbefeuerte Druckbehälter - Teil 3: Konstruktion

This amendment A11 modifies the European Standard EN 13445-3:2002; it was approved by CEN on 21 October 2006.

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 Central Secretariat 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 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

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## Foreword

This document (EN 13445-3:2002/A11:2006) has been prepared by Technical Committee CEN/TC 54 "Unfired pressure vessels", the secretariat of which is held by BSI.

This Amendment to the European Standard EN 13445-3:2002 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2007, and conflicting national standards shall be withdrawn at the latest by June 2007.

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.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

This amendment is based on EN 13445-3 up to issue 16 (October 2005).

The document includes the text of the amendment itself. The corrected pages of EN 13445-3 will be delivered as issue 24 of the standard.

## 2 Normative references

Add the following reference:

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

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### 5.4 Design methods

#### 5.4.1 General

Replace by:

This Part provides requirements for the design of pressure vessels or pressure vessel parts using design by formulae (DBF):

In addition, two series of methods may be used to supplement or replace DBF:

- a) methods based on design by analysis (DBA), namely Design by Analysis – Direct Route covered by Annex B and Design by Analysis – Method based on Stress Categories, covered by Annex C;
- b) methods based on experimental techniques.

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Change the heading of 5.4.2:

#### 5.4.2 Vessels of all testing groups, pressure loading of predominantly non-cyclic nature

Change the beginning of the first paragraph to:

The DBF requirements specified in clauses 7 to 16, annexes G and J, and the DBA requirements of Annex C provide satisfactory ...

---

#### 5.4.6 Design by analysis

Replace by:

If for a part no requirement is supplied in Clauses 7 to 16, Annexes G and J, the rules given in Annexes B and C shall be applied.

The rules of Annex B, Design by Analysis – Direct Route, are applicable to vessels or vessel parts designed to testing group 1 only.

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#### 5.4.8 Prevention of brittle fracture

Replace by:

Detailed recommendations to safeguard against brittle fracture of steel vessels are given in EN 13445-2:2002, Annex B.

## 5.7 Design requirements of welded joints

### 5.7.1 General requirements

*Fourth indent, change to read:*

— applicable testing groups, see EN 13445-5:2002, 6.6.1.1.

*Replace the last sentence by:*

Annex A gives requirements and recommendations for pressure bearing welds. It includes specific requirements which shall be fulfilled when Design by Analysis – Direct Route, according to Annex B, is used.

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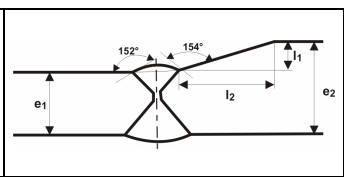
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**Annex A**  
(normative)

**Design requirements for pressure bearing welds**

Modifications and specific requirements are identical to those for creep design

In Table A-1 Longitudinal welds, add a new weld M 8 and renumber the existing weld M 8 as M 9, existing M 9 as M 10 etc.:

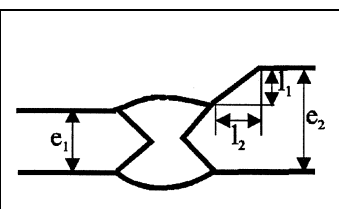
M 8		$l_1/l_2 \leq 1/4$ with smooth transition and angles > 150 °	1, 2, 3, 4	see Table 18.4 details n° 1.3	A	N	1.1.5
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In Table A-1, Column Design requirements, for the new M 9 add:

NOT ALLOWED FOR DBA-DR AND CREEP DESIGN

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In Table A-2 Circular welds, add a new weld C 9 and renumber the existing weld C 9 as C 10, existing C 10 as C 11 etc.:

C 9		$l_1/l_2 \leq 1/3$ with smooth transition and angles > 150 °	1, 2, 3, 4	see Table 18.4 details n° 1.3	A	N	1.1.5
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In Table A-2, Column Design requirements, for the new C 10 add:

NOT ALLOWED FOR DBA-DR AND CREEP DESIGN

In Table A-2, Column Design requirements, from the new C 20 (joint with backing strip) to end add:

NOT ALLOWED FOR DBA-DR AND CREEP DESIGN

Except if the design requirement is already NOT ALLOWED



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*In Table A-2, Column Applicable weld testing group, replace § 5.7.3.1 by § 5.7.4.1 and § 5.7.3.2 by § 5.7.4.2.*

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*In Table A-3 Flat ends, Column Design requirements, add:*

NOT ALLOWED FOR DBA-DR AND CREEP DESIGN

*for welds from E 5 to E 11 and from E 16 to end.*

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*In Table A-4 Tubesheets – Tubesheets to shell, Column Design requirements, add for detail TS 1:*

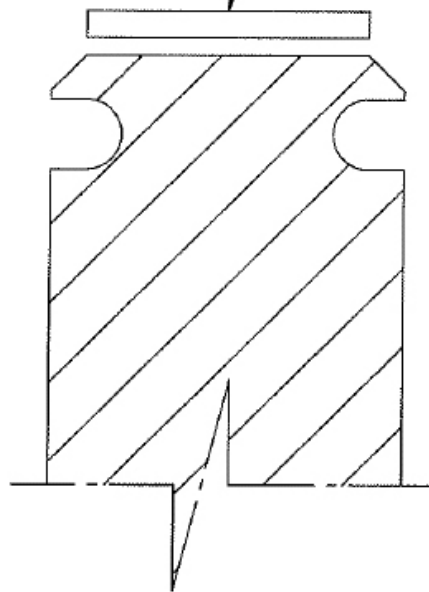
NOT ALLOWED FOR DBA-DR AND CREEP DESIGN unless the tubesheet is a plate or a forging with Z quality testing. At least one tension test shall be made according to the figure below. The specimen (sub-size if necessary) shall be taken from the actual tubesheet with its centreline normal to the tubesheet. It is not acceptable for the test pieces to come from a separated forging as per EN 10222-1:1998 12.2.2.

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### TENSION TEST SPECIMEN

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*In Table A-4 Tubesheets – Tubesheets to shell, Column Design requirements, add for detail TS 2:*