



SLOVENSKI STANDARD
SIST EN 13445-4:2002/A3:2009
01-april-2009

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Unfired pressure vessels - Part 4: Fabrication - Amendment A3

Unbefeuerte Druckbehälter - Teil 4: Herstellung

Réipients sous pression non soumis a la flamme - Partie 4 : Fabrication

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Ta slovenski standard je istoveten z: EN 13445-4:2002/A3:2009

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ICS:

23.020.30	V æ } ^ Á [• [á ^ Ê ä • \ ^ b \ ^ } \ ^	Pressure vessels, gas cylinders
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SIST EN 13445-4:2002/A3:2009 **en,fr,de**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13445-4:2002/A3

January 2009

ICS 23.020.30

English Version

Unfired pressure vessels - Part 4: Fabrication

Réceptifs sous pression non soumis à la flamme - Partie
4: Fabrication

Unbefeuerte Druckbehälter - Teil 4: Herstellung

This amendment A3 modifies the European Standard EN 13445-4:2002; it was approved by CEN on 9 August 2008.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 13445-4:2002/A3:2009) 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 13445-4:2002 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2009, and conflicting national standards shall be withdrawn at the latest by July 2009.

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 EC Directive(s).

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

This document includes the text of the amendment itself. The corrected pages of EN 13445-4 will be delivered as issue 35 of the standard.

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, 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.

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EN 13445-4:2002/A3:2009 (E)**1 Modification of normative references**

In clause 2 "Normative references" the following references shall be changed:

Delete

EN 288-2:1992, *Specification and approval of welding procedures for metallic materials — Part 2: Welding procedure specification for arc welding.*

and replace with

"EN ISO 15609-1:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding (ISO 15609-1:2004)*"

Delete

EN 288-3:1992, *Specification and approval of welding procedures for metallic materials — Part 3: Welding procedure tests for the arc welding of steels.*

and replace with

"EN ISO 15614-1:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2004)*"

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Delete

EN 288-6:1994, *Specification and approval of welding procedures for metallic materials — Part 6: Approval related to previous experience*

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and replace with

"EN ISO 15611:2003, *Specification and qualification of welding procedures for metallic materials — Qualification based on previous welding experience (ISO 15611:2003)*;

Delete

EN 288-7:1995, *Specification and approval of welding procedures for metallic materials — Part 7: Approval by a standard welding procedure for arc welding*

and replace with

"EN ISO 15612:2004, *Specification and qualification of welding procedures for metallic materials — Qualification by adoption of a standard welding procedure (ISO 15612:2004)*"

Delete

EN 288-8:1995, *Specification and approval of welding procedures for metallic materials — Part 8: Approval by a pre-production welding test*

and replace with

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

In all cited places in the subsequent text of EN 13445-4 the above changes of references shall be performed accordingly.

2 Modification of the text of the note to h_1 in Table 5.4-3

The wording of the note to dimension h_1 in Table 5.4-3 (see sub-clause 5.4.6) shall be modified to read:

"The length of the straight flange need, however, not be more than:"

and in the next line the text in the right column shall be modified to read:

"Length of the straight flange"

3 Modification of the text of paragraph a) in sub-clause 7.3

The text of paragraph a) in sub-clause 7.3 shall be amended to read:

"a) For test plates on butt joints equal to or over 20 mm thickness a longitudinal weld tensile test having a minimum diameter equal to or over 6 mm shall be performed in accordance with EN 876:1995 and R_{et} , R_m and A_5 shall satisfy the specified minimum requirements of the base material or for weld consumables requirements in EN 13445-2:2002, clause 4.3.5 or other relevant values specifically taken into account in the design (e.g. austenitic filler metal in combination with 9 % Nickel steel).

Where the design temperature is higher than 300 °C then the test shall be done at the design temperature.

NOTE 1 It is important that special consideration is given where the mechanical properties of the weld are below the base materials by design, e.g. 9 % Ni steels welded with austenitic filler metal."

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Under paragraph c) in sub-clause 7.3 add after "Annex B shall apply":

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"For austenitic steels see also Clause 8.2 a) 2) of this part of the standard."

4 Modification of the text of sub-clause 8.2

Delete the text of sub-clause 8.2 beginning from the first paragraph until and including section a) and replace it with the following wording:

"8.2 Reference criteria

The criteria for the determination the number of production test plates is given below. This is dependent upon the material, the length of welded joints, the thickness, post weld heat treatment (PWHT) and the joint coefficient for each qualified weld procedure. Special provisions are given for testing group 4. The actual testing of production test plates is dependent on the material and the thickness. Additional specific impact testing requirements are also addressed below.

a) In addition to the requirements in c) to f) below impact tests (in accordance with EN 13445-2:2002/A5 B 3.) shall be carried out on a production test plate in the following situations.

1) For ferritic and austenitic-ferritic steels:

- When the material thickness is greater than 12 mm and the required impact temperature T_{KV} is below - 10 °C and the impact test temperature of the welding procedure qualification test qualifying the weld to achieve the required impact energy is not more than 15 °C below the T_{KV} .

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- When the material thickness is greater than 6 mm, but less than or equal to 12 mm, and the required impact temperature T_{KV} is below -30 °C and the impact test temperature of the welding procedure qualification test qualifying the weld to achieve the required impact energy is not more than 15 °C below T_{KV} . These requirements are summarised in table 8.2.

Where a test plate is required by c) to f) below then the impact specimens may be cut from the test plate along with the other required test specimens. Where a test plate is not required by c) to e) then a short test plate sufficient in length only to obtain the required impact tests plus any allowance for retests shall be produced at a frequency of one test plate per vessel welded to the same procedure as the longitudinal welds. Where a number of similar vessels are welded at the same time, to the same welding procedure using the same batch of welding consumables, they may be represented by one production test for impact tests up to a maximum of 25 m of longitudinal weld by agreement of the responsible parties, as appropriate.

Table 8.2 Required production control test plate for impact tests

Thickness of weld seam	$T_{KV} \geq -10\text{ °C}$	$T_{KV} < -10\text{ °C} \geq -30\text{ °C}$		$T_{KV} < -30\text{ °C}$	
		$T_{PQR} \leq T_{KV} - 15\text{ °C}$	$T_{PQR} > T_{KV} - 15\text{ °C}$	$T_{PQR} \leq T_{KV} - 15\text{ °C}$	$T_{PQR} > T_{KV} - 15\text{ °C}$
$\leq 6\text{ mm}$	no	no	no	no	no
$> 6 \leq 12\text{ mm}$	no	no	no	no	yes
$> 12\text{ mm}$	no	no	yes	no	yes

T_{PQR} = the impact test temperature used on the relevant Welding Procedure Qualification test to achieve the required impact energy.

T_{KV} = the required impact test temperature taken from EN 13445-2:2002/A5, Annex B.

NOTE 1 For carbon steels in groups 1.1 and 1.2: When PQR data is at a different test temperature from the required impact test temperature, it may be converted to a common temperature base on the basis of 1,5 J per $^{\circ}\text{C}$. Such conversion shall be permitted only in the range of 18 J to 55 J of Charpy V impact energy. Values in excess of 55 J shall be taken as 55 J. The 1,5 J per $^{\circ}\text{C}$ relationship may also be utilised to determine the temperature adjustment when seeking to compare data at common impact energy levels, however, this may not exceed 15 °C reduction.

EXAMPLE 1 Conversion of 33 J at a T_{PQR} of -20 °C towards 40 J:

33 J at -20 °C may be regarded as equivalent to 40 J at -15 °C .

EXAMPLE 2 Conversion of 100 J at a T_{PQR} of -20 °C towards 40 J (restriction to max. 55 J):

100 J at -20 °C may be regarded as equivalent to 40 J at -30 °C .

EXAMPLE 3 Conversion of 100 J at a T_{PQR} of -20 °C towards 27 J (restriction to max. 55 J and reduction of max. 15 °C)

With 100 J at -20 °C one can use an equivalent of 27 J at a temperature not lower than -35 °C .

2. For austenitic steels: