SLOVENSKI STANDARD
SIST EN 13445-2:2014/A3:2018

01-november-2018

Neogrevane (nekurjene) tlačne posode - 2. del: Materiali - Dopolnilo A3

Unfired pressure vessels - Part 2: Materials

Unbefeuerte Druckbehälter - Teil 2: Werkstoffe

Récipients sous pression non soumis à la flamme - Partie 2 : matériaux

Ta slovenski standard je istoveten z: **EN 13445-2:2014/A3:2018**

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Unfired pressure vessels - Part 2: Materials

Récipients sous pression non soumis à la flamme - Partie 2 : matériaux

Unbefeuerte Druckbehälter - Teil 2: Werkstoffe

This amendment A3 modifies the European Standard EN 13445-2:2014; it was approved by CEN on 13 May 2018.

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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 13445-2:2014/A3:2018) 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of an identical text or by endorsement, at the latest by February 2019, and conflicting national standards shall be withdrawn at the latest by February 2019.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 13445-2:2014.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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 Modification to Clause 2 Normative reference

Replace "EN 10269:1999+A1:2006, *Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties*" *with* "EN 10269:2013, *Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties* "

2 Modifications to B.2.2.4 Bolts and nuts

Replace the text in B.2.2.4 with the following:

"Requirements for prevention of brittle fracture are specified in Tables B.2-8, B.2-9 and B.2-10.

For other bolts and nuts the following applies:

— a specified impact energy of minimum 40 J is required at T_{KV} = RT for $T_M \geq -10$ °C;

— if T_M is lower than −10 °C, specified impact energy of minimum 40 J is required at $T_{KV} \leq T_M$;

— bolting material with a design temperature below –160 °C shall be impact tested at –196 °C."

Replace Table B.2-8 with the following:

"Table B.2–8 — General requirements for prevention of brittle fracture with reference thickness for nuts and bolts for $T_M \geq$ -10 °C

European Standard	Type of material a)	Thickness limitation	Impact test for $T_M \geq$ -10 °C	Test temperature / value
EN 10269:2013	All steels	According to EN 10269:2013	According to EN 10269:2013, Table 4	According to EN 10269:2013, Table 4
EN ISO 898-1:2013	5.6	M ≤ 39	M ≥ 16	RT b) / 40 J
	8.8	M ≤ 39	M ≥ 16	RT b) / 52 J
EN ISO 898-2:2012	5	M ≤ 39	None	—
	8	M ≤ 39	None	—

a) Starting material shall comply with EN 10269:2013. Bolting according to EN ISO 898-1:2013 and EN ISO 898-2:2012 is suitable only for temperatures up to 50 °C (see 4.2.2.1).

b) Testing in accordance with EN 10269:2013. Additional testing is required to comply with T_M = -20°C in accordance with EN ISO 898-1:2013, 9.14.

"

Replace Table B.2-9 with the following:

"Table B.2–9 — General requirements for prevention of brittle fracture with reference thickness for nuts and bolts, bolting material according to EN 10269:2013

Type of material	Thickness limitation	Impact test (impact energy of minimum 40 J)	T_M
1.4307, 1.4301, 1.4303, 1.4404, 1.4401, 1.4948, 1.4919, 1.4941	According to EN 10269:2013, Table 10	According to EN 10269:2013, Table 4	–196 °C
1.4429, 1.4910, 1.4980	According to EN 10269:2013, Table 10	According to EN 10269:2013, Table 4	–273 °C
1.5525, 1.1133	According to EN 10269:2013, Table 10	According to EN 10269:2013, Table 10	–20 °C
1.7218	$d \leq 60$ mm	According to EN 10269:2013, Table 10	–60 °C
	$60 < d \leq 100$ mm		–50 °C
1.6582, 1.6580, 1.7225	According to EN 10269:2013, Table 10	According to EN 10269:2013, Table 10	–40 °C
1.5680	$d \leq 40$ mm	According to EN 10269:2013, Table 10	–120 °C
	$40 < d \leq 75$ mm		–90 °C
1.5662	According to EN 10269:2013, Table 10	According to EN 10269:2013, Table 10	–196 °C

"

Replace in Table B.2-10 with the following

"Table B.2–10 — General requirements for prevention of brittle fracture with reference thickness for nuts and bolts

Standard	Type of material [a]		Thickness limitation	T_M	Impact test
EN ISO 3506-1:2009	A2, A3	50	M ≤ 39	– 200 °C	None
		70	M ≤ 24		
EN ISO 3506-1:2009	A4, A5	50	M ≤ 39	– 60 °C [b]	None
		70	M ≤ 24		
EN ISO 3506-2:2009	A2, A3, A4, A5	50	M ≤ 39	– 200 °C	None
		70	M ≤ 24		

[a] Nuts and bolts shall comply with EN 13445-2:2014, F.2.

[b] –200 °C for studs or hot forged bolts with head in property class 50.

"

3 Modification to Table E.2-1

Add to the lines 174, 176, 178, 183, 186 and 189 the following note i:

"For 1.4923 +QT2, 1.4913 +QT, 1.4307 +C800, 1.4303 +C800, 1.4404 +C800 and 1.4401 +C800: These grades are acceptable as long as the relevant safety factors for bolting specified in EN 13445-3 are applied."

4 Modification to Annex F

Add the following new Annex F:

"

Annex A
(normative)

Special provisions for materials and components

A.1 General

Regularly used materials and components which are not or not properly specified in harmonised material standards may be applied under this standard provided that they comply with the requirements specified below.

Likewise, this annex covers applications for which no European harmonised standards exist but which are deemed essential in the context of this standard.

A.2 Mechanical properties and technical delivery conditions for fasteners in accordance with EN ISO 3506

A.2.1 Mechanical properties for austenitic bolts in accordance with EN ISO 3506-1

Allowable stresses for bolting material in accordance with EN ISO 3506-1 which shall be used for calculation in accordance with EN 13445-3:2014, Annex G, and EN 1591 are given in Table F.2.1.

The value for strength class 50 at 50 °C is 125 MPa, and the value for strength class 70 at 50 °C is 175 MPa if bolting is calculated in accordance with EN 13445-3:2014, Clause 11.

Table F.2.1 — Allowable stresses (nominal design stresses) for bolts at elevated temperatures

Steel group	Strength class	Diameter range	Allowable stresses at:				
			20 °C	100 °C	200 °C	300 °C	400 °C
A2 to A5	50	≤ M 39	140 MPa	117 MPa	103 MPa	90 MPa	83 MPa
	70	≤ M 24	300 MPa	253 MPa	240 MPa	223 MPa	210 MPa
		> M 24 to ≤ M 30	175 MPa	140 MPa	133 MPa	123 MPa	117 MPa

A.2.2 Delivery conditions for austenitic fasteners

The following applies for material specified in Table F.2.1: All fasteners shall comply with EN ISO 3506-1, EN ISO 3506-2, and the requirements specified in Table F.2.2: