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Unfired pressure vessels - Part 2: Materials

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/24

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EUROPEAN STANDARD

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EUROPÄISCHE NORM

EN 13445-2:2021+A1

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English Version

Unfired pressure vessels - Part 2: Materials

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

Unbefeuerte Druckbehälter - Teil 2: Werkstoffe

This European Standard was approved by CEN on 24 February 2021 and includes Amendment 1 approved by CEN on 21 February 2023 and Amendment 1 approved by CEN on 13 June 2023.

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.

This European Standard 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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 13445-2:2021+A1:2023) 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of an identical text or by endorsement, at the latest by February 2024, and conflicting national standards shall be withdrawn at the latest by February 2024.

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 supersedes ▌A1⟩ EN 13445-2:2021 ⟨A1▌.

This document includes Amendment 1 approved by CEN on 21 February 2023.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ▌A1⟩ ⟨A1▌.

This document has been prepared under a standardisation request addressed to [the relevant ESO] by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

The list of all parts in the EN 13445 series can be found on the CEN website.

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 13445-2:2014. 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.

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 13445:2021 each year, starting with the precedent as Issue 1, consolidating these Amendments and including other identified corrections.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies the requirements for steel products used for unfired pressure vessels.

For some metallic materials other than steel, such as spheroidal graphite cast iron, aluminium, nickel, copper, titanium, requirements are or will be formulated in separate parts of this document.

For metallic materials which are not covered by a harmonized material standard and are not likely to be in near future, specific rules are given in this part or the above cited parts of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 764-1:2015+A1:2016, *Pressure equipment — Terminology — Part 1: Pressure, temperature, volume, nominal size*

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

[A1] *Deleted reference* [A1]

EN 764-4:2014, *Pressure equipment — Part 4: Establishment of technical delivery conditions for metallic materials*

EN 764-5:2014, *Pressure equipment — Part 5: Inspection documentation of metallic materials and compliance with the material specification*

EN 1092-1:2018, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

[A1] EN 10028-2:2017 [A1], *Flat products made of steels for pressure purposes — Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

[A1] EN 10028-3:2017 [A1], *Flat products made of steels for pressure purposes — Part 3: Weldable fine grain steels, normalized*

[A1] EN 10028-4:2017 [A1], *Flat products made of steels for pressure purposes — Part 4: Nickel alloy steels with specified low temperature properties*

[A1] EN 10028-5:2017 [A1], *Flat products made of steels for pressure purposes — Part 5: Weldable fine grain steels, thermomechanically rolled*

[A1] EN 10028-6:2017 [A1], *Flat products made of steels for pressure purposes — Part 6: Weldable fine grain steels, quenched and tempered*

[A1] EN 10028-7:2016 [A1], *Flat products made of steels for pressure purposes — Part 7: Stainless steels*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN 10216-3:2013, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 3: Alloy fine grain steel tubes*

EN 10216-4:2013, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 4: Non-alloy and alloy steel tubes with specified low temperature properties*

▌A1⟩ EN 10217-3:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 3: Electric welded and submerged arc welded alloy fine grain steel tubes with specified room, elevated and low temperature properties* ⟨A1▌

▌A1⟩ EN 10217-4:2019 ⟨A1▌, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 4: Electric welded non-alloy steel tubes with specified low temperature properties*

▌A1⟩ EN 10217-6:2019 ⟨A1▌, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 6: Submerged arc welded non-alloy steel tubes with specified low temperature properties*

▌A1⟩ EN 10222-3:2017 ⟨A1▌, *Steel forgings for pressure purposes — Part 3: Nickel steels with specified low temperature properties*

▌A1⟩ EN 10222-4:2017+A1:2021 ⟨A1▌, *Steel forgings for pressures purposes — Part 4: Weldable fine grain steels with high proof strength*

EN 10269:2013, *Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties*

▌A1⟩ EN 10273:2016 ⟨A1▌, *Hot rolled weldable steel bars for pressure purposes with specified elevated temperature properties*

EN 12074:2000, *Welding consumables — Quality requirements for manufacture, supply and distribution of consumables for welding and allied processes*

EN 13445-1:2021, *Unfired pressure vessels — Part 1: General*

EN 13445-3:2021, *Unfired pressure vessels — Part 3: Design*

EN 13445-4:2021, *Unfired pressure vessels — Part 4: Fabrication*

EN 13445-5:2021, *Unfired pressure vessels — Part 5: Inspection and testing*

▌A1⟩ EN 13479:2017 ⟨A1▌, *Welding consumables — General product standard for filler metals and fluxes for fusion welding of metallic materials*

▌A1⟩ EN ISO 148-1:2016, Metallic materials — Charpy pendulum impact test — Part 1: Test method (ISO 148-1:2016) ⟨A1▌

▌A1⟩ EN ISO 204:2018 ⟨A1▌, *Metallic materials — Uniaxial creep testing in tension — Method of test* (ISO 204:2009)

EN ISO 898-1:2013, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread* (ISO 898-1:2013)

EN ISO 898-2:2012, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 2: Nuts with specified property classes — Coarse thread and fine pitch thread* (ISO 898-2:2012)

〚A1〛 EN ISO 2566-1:2021, Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels (ISO 2566-1:2021) 〚A1〛

〚A1〛 EN ISO 2566-2:2021, Steel — Conversion of elongation values — Part 2: Austenitic steels (ISO 2566-2:2021) 〚A1〛

〚A1〛 EN ISO 3506-1:2020, *Mechanical properties of corrosion-resistant stainless-steel fasteners — Part 1: Bolts, screws and studs with specified grades and property classes* (ISO 3506-1:2020) 〚A1〛

〚A1〛 EN ISO 3506-2:2020, *Mechanical properties of corrosion-resistant stainless-steel fasteners — Part 2: Nuts with specified grades and property classes* (ISO 3506-2:2020) 〚A1〛

〚A1〛 EN ISO 6892-1:2019, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature* (ISO 6892-1:2019) 〚A1〛

〚A1〛 CEN ISO/TR 15608:2017, *Welding — Guidelines for a metallic materials grouping system (ISO/TR 15608:2017)* 〚A1〛