

English Version

Simple unfired pressure vessels designed to contain air or  
nitrogen - Part 2: Pressure vessels for air braking and  
auxiliary systems for motor vehicles and their trailers

Réipients à pression simples, non soumis à la flamme,  
destinés à contenir de l'air ou de l'azote - Partie 2 :  
Réipients à pression pour circuits de freinage et  
circuits auxiliaires des véhicules routiers et leurs  
remorques

Einfache, unbefeuerte Druckbehälter für Luft oder  
Stickstoff - Teil 2: Druckbehälter für  
Druckluftbremsanlagen und Hilfseinrichtungen in  
Kraftfahrzeugen und deren Anhängerfahrzeugen

This draft European Standard is submitted to CEN members for formal vote. It has been drawn up by the Technical Committee CEN/TC 54.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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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 (FprEN 286-2:2022) has been prepared by Technical Committee CEN/TC 54 “Unfired pressure vessels”, the secretariat of which is held by BSI.

This document is currently submitted to the Formal Vote.

This document will supersede EN 286-2:1992.

Modifications to EN 286-2:1992:

- adaptation to Directive 2014/29/EU;
- general revision and correction;
- update of normative references;
- revision of Clause 4 “Materials”;
- revision of the annexes and restructuring.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

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

## 1 Scope

**1.1** This document applies to the design and manufacture of simple unfired serially pressure vessels, herein after referred to as vessels, designed for air brake equipment and auxiliary systems for motor vehicles and their trailers, and which:

- a) include fabrication by welding;
- b) have a simple geometry enabling simple-to-use production procedures. This is achieved by either:
  - 1) a cylindrical shell of circular cross section closed by outwardly dished and/or flat ends having the same axis of revolution as the shell; or
  - 2) two dished ends having the same axis of revolution;
- c) have branches not larger in diameter than 0,5 of the diameter of the cylinder to which they are welded.

**1.2** It applies to vessels intended to contain only compressed air, and which operate within the following constraints:

- a) subjected to an internal pressure greater than 0,5 bar;
- b) the parts and assemblies contributing to the strength of the vessel under pressure to be made either of non-alloy quality steel or of non-alloy aluminium or non-age hardening aluminium alloys;
- c) maximum working pressure 30 bar, the product of that pressure and the capacity of the vessel ( $PS \cdot V$ ) is greater than 50 bar l and not exceeding 1 500 bar l;
- d) capacity not exceeding 150 l;
- e) minimum working temperature not lower than  $-50\text{ °C}$  and maximum working temperature not higher than  $100\text{ °C}$  for aluminium vessels and not higher than  $150\text{ °C}$  for steel vessels.

It does not apply to vessels specifically designed for nuclear use, to vessels specifically intended for installation in or the propulsion of ships and aircraft, or to fire extinguishers.

## 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.

FprEN 286-1:2022, *Simple unfired pressure vessels designed to contain air or nitrogen — Part 1: Pressure vessels for general purposes*

EN 1515-4:2021, *Flanges and their joints — Bolting — Part 4: Selection of bolting for equipment subject to the Pressure Equipment Directive 2014/68/EU*

EN 10028-1:2017, *Flat products made of steels for pressure purposes — Part 1: General requirements*

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

EN 10207:2017, *Steels for simple pressure vessels — Technical delivery requirements for plates, strips and bars*

EN 10216-1:2013, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 1: Non-alloy steel tubes with specified room temperature properties*

EN 10216-2:2013+A1:2019, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 2: Non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10217-1:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 1: Electric welded and submerged arc welded non-alloy steel tubes with specified room temperature properties*

EN 10217-2:2019, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10222-2:2017+A1:2021, *Steel forgings for pressure purposes — Part 2: Ferritic and martensitic steels with specified elevated temperatures properties*

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

EN ISO 148-1:2016<sup>1</sup>, *Metallic materials — Charpy pendulum impact test — Part 1: Test method (ISO 148-1:2016)*

EN ISO 1461:2009, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods (ISO 1461:2009)*

EN ISO 2409:2020, *Paints and varnishes — Cross-cut test (ISO 2409:2020)*

EN ISO 3834-2:2021, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements (ISO 3834-2:2021)*

EN ISO 3834-3:2021, *Quality requirements for fusion welding for metallic materials — Part 3: Standard quality requirements (ISO 3834-3:2021)*

EN ISO 4136:2022, *Destructive tests on welds in metallic materials — Transverse tensile test (ISO 4136:2022)*

EN ISO 5173:2010, *Destructive tests on welds in metallic materials — Bend tests (ISO 5173:2009)*

EN ISO 5817:2014, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections (ISO 5817:2014)*

EN ISO 6520-1:2007, *Welding and allied processes — Classification of geometric imperfections in metallic materials — Part 1: Fusion welding (ISO 6520-1:2007)*

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

EN ISO 9227:2017, *Corrosion tests in artificial atmospheres — Salt spray tests (ISO 9227:2017)*

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<sup>1</sup> As impacted by EN ISO 148-1 Supplement 1.

EN ISO 9606-1:2017, *Qualification testing of welders — Fusion welding — Part 1: Steels (ISO 9606-1:2012 including Cor 1:2012 and Cor 2:2013)*

EN ISO 9606-2:2004, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys (ISO 9606-2:2004)*

EN ISO 9712:2022, *Non-destructive testing — Qualification and certification of NDT personnel (ISO 9712:2021)*

EN ISO 10042:2018, *Welding — Arc-welded joints in aluminium and its alloys — Quality levels for imperfections (ISO 10042:2018)*

EN ISO 14341:2020, *Welding consumables — Wire electrodes and weld deposits for gas shielded metal arc welding of non alloy and fine grain steels — Classification (ISO 14341:2020)*

EN ISO 14732:2013, *Welding personnel — Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials (ISO 14732:2013)*

EN ISO 15607:2019, *Specification and qualification of welding procedures for metallic materials — General rules (ISO 15607:2019)*

EN ISO 15609-1:2019, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding (ISO 15609-1:2019)*

EN ISO 15614-1:2017, *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 15614-1:2017)*

EN ISO 15614-2:2005, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 2: Arc welding of aluminium and its alloys (ISO 15614-2:2005)*

EN ISO 17636-1:2022, *Non-destructive testing of welds — Radiographic testing — Part 1: X- and gamma-ray techniques with film (ISO 17636-1:2022)*

EN ISO 17636-2:2013, *Non-destructive testing of welds — Radiographic testing — Part 2: X- and gamma-ray techniques with digital detectors (ISO 17636-2:2013)*

EN ISO 18273:2015, *Welding consumables — Wire electrodes, wires and rods for welding of aluminium and aluminium alloys — Classification (ISO 18273:2015)*

ISO 209:2007, *Aluminium and aluminium alloys — Chemical composition*

ISO 2107:2007, *Aluminium and aluminium alloys — Wrought products — Temper designations*

ISO 6361-2:2014, *Wrought aluminium and aluminium alloys — Sheets, strips and plates — Part 2: Mechanical properties*

ISO 6362-2:2022, *Wrought aluminium and aluminium alloys — Extruded rods/bars, tubes and profiles — Part 2: Mechanical properties*