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Edition 1 and nat. amdt 1

EN 286-4:1994

Edition 1

Any reference to SABS EN 286-4 is deemed
to be a reference to this standard
(Government Notice No. 1373 of 8 November 2002)

SOUTH AFRICAN NATIONAL STANDARD

**Simple unfired pressure vessels designed to
contain air or nitrogen**

**Part 4: Aluminium alloy pressure vessels
designed for air braking equipment and
auxiliary pneumatic equipment for railway
rolling stock**

This national standard is the identical implementation of EN 286-4:1994, and is adopted with the permission of CEN, rue de Stassart 36, B-1050 Brussels.

SANS 50286-4:1994

Edition 1 and nat. amdt 1

EN 286-4:1994

Edition 1

Table of changes

Change No.	Date	Scope
Nat. amdt 1	2007	Amended to change the designation from SABS to SANS, with no technical changes.

National foreword

This South African standard was approved by National Committee SABS TC 58, *Vessels and systems under pressure*, in accordance with procedures of the SABS Standards Division, in compliance with annex 3 of the WTO/TBT agreement.

This part of SANS 50286 was published in March 2007. This SANS edition is technically identical to the first SABS edition (SABS EN 286-4:1994).

**Reaffirmed and reprinted in March 2013.
This document will be reviewed every five years
and be reaffirmed, amended, revised or withdrawn.**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 286-4

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Descriptors: Railway rolling stock, brakes, pneumatic equipment, pressure vessels, tanks containers, aluminium alloys, design, computation, production control, weld defects, acceptability, assembling, certification, marking

English version

Simple unfired pressure vessels designed to contain air or nitrogen — Part 4: Aluminium alloy pressure vessels designed for air braking equipment and auxiliary pneumatic equipment for railway rolling stock

Réipients à pression simples, non soumis à la flamme, destinés à contenir de l'air ou de l'azote — Partie 4: Réipients à pression en alliages d'aluminium destinés aux équipements pneumatiques de freinage et aux équipements pneumatiques auxiliaires du matériel roulant ferroviaire

Einfache unbefeuerte Druckbehälter für Luft oder Stickstoff — Teil 4: Druckbehälter aus Aluminiumlegierungen für Druckluftbremsanlagen und pneumatische Hilfseinrichtungen in Schienenfahrzeugen

This European Standard was approved by CEN on 1994-09-09. 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 Central Secretariat or to any CEN member.

The European Standards exist 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, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

This European Standard was prepared by CEN/TC 54, Unfired pressure vessels, of which the secretariat is held by BSI.

This European Standard has been prepared under a Mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of the EC Directive(s).

CEN/TC 54 decided to submit the final draft for formal vote by its resolution. The result was positive.

This part is one of a series of four. The other Parts are:

Part 1: *Design, manufacture and testing*

Part 2: *Pressure vessels for air braking and auxiliary systems for motor vehicles and their trailers*

Part 3: *Steel pressure vessels designed for air braking equipment and auxiliary pneumatic equipment for railway rolling stock*

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 March 1995, and conflicting national standards shall be withdrawn at the latest by March 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain and United Kingdom

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1 Scope

1.1 This Part of this European Standard is applicable to simple unfired aluminium alloy pressure vessels, referred to as 'vessel' in this standard, designed for air braking equipment and auxiliary pneumatic equipment for railway rolling stock (see 1.6).

1.2 The vessels to this standard are:

- a) made from a single shell;
- b) made from aluminium alloy;
- c) fabricated by welding;
- d) used at a maximum working pressure of 10 bar;
- e) the product of the maximum working pressure (in bar) and the volume (in litre):
 $500 \text{ bar litres} < PV \leq 10\,000 \text{ bar litres}$;
- f) made of a cylindrical part of circular cross-section called the shell with two outwardly dished torispherical ends, that is two dished ends with the same axis of rotation. This standard therefore does not apply to vessels with one or two flat ends or those made up of several compartments;
- g) calculated with a design pressure P (see 5.1.4.2);
- h) designed for a working temperature of between -50°C and $+100^\circ\text{C}$ [$+65^\circ\text{C}$ for certain grades of aluminium alloy (see 4.1.1)];
- j) fastened to the vehicles by straps;

1.3 In normal service, a momentary overpressure of 1 bar of the maximum working pressure is permitted (10 % of P_s).

1.4 This Part of this European Standard applies to the vessel proper, from the inlet connection to the outlet connection and to all other connections and fittings belonging to the vessel.

1.5 This Part of this European Standard gives the requirements to be met for the calculation, design, fabrication, inspection during fabrication and certification of the vessel, and fittings for assembly to the vehicle.

These requirements cannot be written in sufficient detail to ensure good workmanship or proper construction. Each manufacturer is therefore responsible for taking every necessary step to make sure that the quality of workmanship and construction is such as to ensure compliance with good engineering practice.

This Part of this standard gives:

- a) in annex F, recommendations for assembly to the vehicles;
- b) in annex G, recommendations for the service surveillance of vessels.

1.6 The requirements of this Part of this European Standard apply to vessels designed to be fitted to rail vehicles used on the main national networks, urban networks, underground railways, trams, private networks (regional railways, company railways, . . .).

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- EN 287-2 *Approval testing of welders — fusion welding — Part 2: Aluminium and aluminium alloys*
- EN 288-1 *Specifications and approval of welding procedures for metallic materials — Part 1: General rules for fusion welding*
- EN 288-2 *Specification and approval of welding procedures for metallic materials — Part 2: Welding procedure specification for arc welding*
- EN 288-4 *Specification and approval of welding procedures for metallic materials — Part 4: Welding procedure tests for the arc welding of aluminium and its alloy*
- EN 10025 *Hot rolled products of non-alloy structural steels — Technical delivery conditions*
- EN 26520 *Classification of imperfections in metallic fusion welds, with explanations*
- ISO 209-1 *Wrought aluminium and aluminium alloys — Chemical composition and forms of product — Part 1: Chemical composition*
- ISO 209-2 *Wrought aluminium and aluminium alloys — Chemical composition and forms of product — Part 2: Forms of products*
- ISO 228-1 *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Designation, dimensions and tolerances*
- ISO 261 *ISO general purpose metric screw threads — General plan*
- ISO 1101 *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings*