



SLOVENSKI STANDARD

SIST EN 14286:2007

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Nadomešča:
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Aluminij in aluminijeve zlitine – Varljivi valjani izdelki za rezervoarje za shranjevanje in prevažanje nevarnih snovi

Aluminium and aluminium alloys - Weldable rolled products for tanks for the storage and transportation of dangerous goods

Aluminium und Aluminiumlegierungen - Schweißbare Walzerzeugnisse für Tanks für Lagerung und Transport von Gefahrgut

Aluminium et alliages d'aluminium - Produits laminés soudables pour réservoirs de stockage et de transport des matières dangereuses

Ta slovenski standard je istoveten z: EN 14286:2007

ICS:

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Aluminium and aluminium alloys - Weldable rolled products for tanks for the storage and transportation of dangerous goods

Aluminium et alliages d'aluminium - Produits laminés soudables pour réservoirs de stockage et de transport des matières dangereuses

Aluminium und Aluminiumlegierungen - Schweißbare Walzerzeugnisse für Tanks für Lagerung und Transport von Gefahrgut

This European Standard was approved by CEN on 15 February 2007.

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Foreword

This document (EN 14286:2007) has been prepared by Technical Committee CEN/TC 132 "Aluminium and aluminium alloys", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by September 2007, and conflicting national standards shall be withdrawn at the latest by September 2007.

This document supersedes EN 14286:2004.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 7 "Sheets, strips and plates" to revise EN 14286:2004.

The following technical changes have been made:

- Clause 4: addition of alloys EN AW-5059 and EN AW-5088;
- subclause 7.3 – Table 1: addition of alloys EN AW-5059 and EN AW-5088 with their mechanical properties;
- separation between EN AW-5083 & EN AW-5383, EN AW-5182 & EN AW-5186.

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Introduction

It is essential that aluminium alloy semi-finished rolled products intended for the construction of tanks for the storage and transportation of dangerous goods satisfy a certain number of specific technical conditions for inspection and delivery as well as specific mechanical and other properties which distinguish them from similar semi-finished products for general applications.

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1 Scope

This document specifies the technical conditions of inspection and delivery, the mechanical properties, the tolerances on dimensions and form of rolled semi-finished aluminium alloy products intended for tanks for the storage and transportation of dangerous goods, in particular of gasoline and other liquid hydrocarbons.

It applies to hot or cold-rolled strip, sheet and plate with a thickness from 3,0 mm and up to and including 12,0 mm used as a wall material.

NOTE Compliance with the present document does not ensure compliance with national or international regulations. The user of the document is responsible for checking that the material he orders or sells complies with all applicable regulations. Depending on the chemical and physical properties of the dangerous good to be transported or stored, it can be necessary to agree on additional properties or inspection conditions in order to comply with applying regulations.

2 Normative references

The following referenced documents are indispensable for the application 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.

prEN 485-1, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 1: Technical conditions for inspection and delivery*

EN 485-3, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 3: Tolerances on dimensions and form for hot-rolled products*

EN 485-4, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 4: Tolerances on shape and dimensions for cold-rolled products*

EN 515, *Aluminium and aluminium alloys — Wrought products — Temper designations*

EN 573-3, *Aluminium and aluminium alloys — Chemical composition and form of wrought products — Part 3: Chemical composition*

EN 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

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

EN 12258-1:1998, *Aluminium and aluminium alloys — Terms and definitions — Part 1: General terms*

EN ISO 7438, *Metallic materials — Bend test (ISO 7438:2005)*

ASTM G66, *Standard Test Method for Visual Assessment of Exfoliation Corrosion Susceptibility of 5XXX Series Aluminum Alloys (ASSET Test)*

ASTM G67, *Standard Test Method for Determining the Susceptibility to Intergranular Corrosion of 5XXX Series Aluminum Alloys by Mass Loss After Exposure to Nitric Acid (NAMLT Test)*

ASTM B928/B928M-04a, *Standard Specification for High Magnesium Aluminum-Alloy Sheet and Plate for Marine Service*

EN 14286:2007 (E)**3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 12258-1:1998 and the following apply.

3.1**capability clause**

reference to “capability clause” signifies that sufficient evidence of a statistical nature with respect to the properties under consideration can be submitted by the manufacturer to demonstrate that the requirements of the relevant material standard or specification can be met on the basis of a reduced amount of testing

4 Selection of materials

Appropriate material of the series 1xxx (with a minimum aluminium content of 99,5 %), 2xxx, 5xxx and 6xxx can be used. Their chemical composition shall conform to EN 573-3 or to Annex A.

NOTE 1 Annex A is used for those alloys which are not yet included in EN 573-3 at the time of publication of this European Standard, eg. EN AW-5059 and EN AW-5088.

NOTE 2 Weldability and corrosion resistance of 2xxx series alloys are globally inferior compared to 1xxx, 5xxx and 6xxx series alloys. This aspect should be taken into account when selecting appropriate material.

The following alloys are recommended for tanks for the storage and transportation of gasoline and other liquid hydrocarbons: EN AW-5059, EN AW-5083, EN AW-5086, EN AW-5088, EN AW-5182, EN AW-5186, EN AW-5383, EN AW-5454, EN AW-5754.

Although the supplier of the material is not responsible for the final use and application, it is helpful to indicate the final use of the product, and especially the type of dangerous goods which will be in contact with the material (such as gasoline, other hydrocarbon liquids, halogenated hydrocarbon liquids, phenols, alcohols, ketones, sodium perchlorate etc.).

5 Designation of the products

The designation of the aluminium alloys shall conform to EN 573-3 or to Annex A.

The designation of the tempers shall conform to EN 515.

6 Ordering information

The relevant requirements of prEN 485-1 shall apply, with the following additional provisions:

- a) the order document shall refer to the present document;
- b) the order document should specify the type of the inspection document according to EN 10204 (see 8.2);
- c) the order document should specify the tolerances on thickness applicable (see 7.5);
- d) the order document shall specify mechanical and other relevant properties, if they differ from those specified in the present document or if materials other than those recommended in the present document are used.

7 Requirements

7.1 General

For determination of the final use, the manufacturer of the tank shall take into account additional legal regulation and the suitability of the material chosen.

7.2 Technical conditions for inspection and delivery

Unless otherwise specified in the present document or in the order, the relevant requirements of prEN 485-1 shall apply.

7.3 Mechanical properties

For all aluminium and aluminium alloys, the following requirements shall be fulfilled:

- a) the elongation at rupture (in %) shall not be less than the greater of the following two values: $10\,000 / 6 R_m$ (where R_m is expressed in MPa), or 12 %.

NOTE 1 Materials listed in Table 1 always fulfil this requirement;

- b) the minimum guaranteed proof stress $R_{p0,2}$ shall not be greater than 0,85 times the minimum tensile strength R_m .

NOTE 2 Materials listed in Table 1 always fulfil this requirement;

- c) the minimum bending radius at 180°, measured according to EN ISO 7438, shall be smaller than 5 times the thickness if $R_m \leq 98$ MPa, or smaller than 6 times the thickness if $R_m > 98$ MPa;

- d) for thickness from 6 mm to 12 mm, the bending radius at 90° shall be measured according to prEN 485-1.

Unless otherwise specified by the purchaser, the "capability clause" shall apply for bending radius.

For the materials recommended in Clause 4, the mechanical properties at ambient temperature shall conform to Table 1. Higher mechanical properties can be agreed upon between supplier and purchaser.

NOTE 3 The mechanical properties specified in Table 1 allow the determination of the minimum wall thickness of the tank on the basis of the equivalence formula specified in the A.D.R. regulation.

The mechanical properties at ambient temperature shall be measured according to EN 10002-1, using proportional test pieces, and taking into account the particular requirements of the A.D.R. [1]. The elongation A shall be measured, in accordance with this Regulation, in the following manner:

For rolled products, the axis of the tensile test pieces shall be perpendicular to the rolling direction. The elongation at rupture A shall be measured by means of round-section test pieces, the gauge length L_o of which shall be equal to five times the diameter d . In the case of test pieces with rectangular cross-section, the gauge length shall be calculated by the formula:

$$L_o = 5,65 \sqrt{S_o}, \text{ where } S_o \text{ is the initial section of the test piece.}$$