

# SVENSK STANDARD

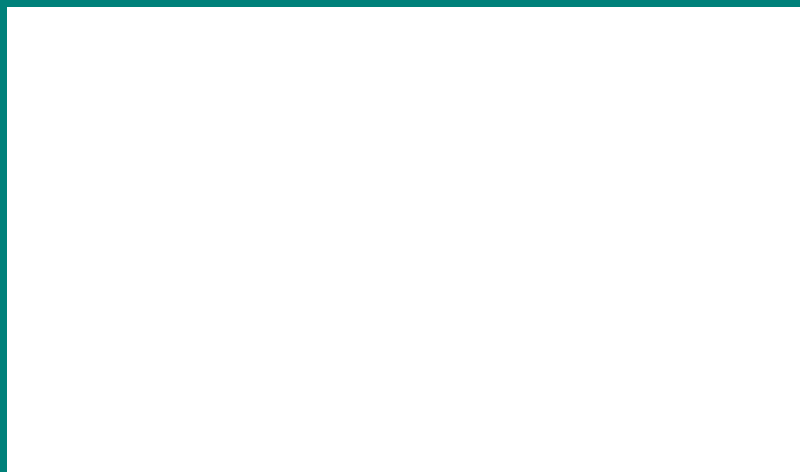
## SS-EN 14286:2008

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**Aluminium och aluminiumlegeringar – Svetsbara valsade produkter för tankar för transport och lagring av farligt gods**

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



# Hitta rätt produkt och ett leveranssätt som passar dig

## Standarder

Genom att följa gällande standard både effektiviserar och säkrar du ditt arbete. Många standarder ingår dessutom ofta i paket.

## Tjänster

Abonnemang är tjänsten där vi uppdaterar dig med aktuella standarder när förändringar sker på dem du valt att abonnera på. På så sätt är du säker på att du alltid arbetar efter rätt utgåva.

e-nav är vår online-tjänst som ger dig och dina kollegor tillgång till standarder ni valt att abonnera på dygnet runt. Med e-nav kan samma standard användas av flera personer samtidigt.

## Leveranssätt

Du väljer hur du vill ha dina standarder levererade. Vi kan erbjuda dig dem på papper och som pdf.

## Andra produkter

Vi har böcker som underlättar arbetet att följa en standard. Med våra böcker får du ökad förståelse för hur standarder ska följas och vilka fördelar den ger dig i ditt arbete. Vi tar fram många egna publikationer och fungerar även som återförsäljare. Det gör att du hos oss kan hitta över 500 unika titlar. Vi har även tekniska rapporter, specifikationer och "workshop agreement".

Matriser är en översikt på standarder och handböcker som bör läsas tillsammans. De finns på sis.se och ger dig en bra bild över hur olika produkter hör ihop.

## Standardiseringsprojekt

Du kan påverka innehållet i framtida standarder genom att delta i någon av SIS ca 400 Tekniska Kommittéer.

# Find the right product and the type of delivery that suits you

## Standards

By complying with current standards, you can make your work more efficient and ensure reliability. Also, several of the standards are often supplied in packages.

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## Standardisation project

You can influence the content of future standards by taking part in one or other of SIS's 400 or so Technical Committees.

Europastandarden EN 14286:2008 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 14286:2008.

Denna standard ersätter SS-EN 14286:2007, utgåva 2.

The European Standard EN 14286:2008 has the status of a Swedish Standard. This document contains the official English version of EN 14286:2008.

This standard supersedes the Swedish Standard SS-EN 14286:2007, edition 2.

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Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00.

Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), tel +46 8 555 520 00.

Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 14286**

September 2008

ICS 77.150.10

Supersedes EN 14286:2007

English Version

## 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 8 August 2008.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 14286:2008) 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 March 2009, and conflicting national standards shall be withdrawn at the latest by March 2009.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14286:2007.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 7 "Sheets, strips and plates" to revise EN 14286:2007.

The following technical changes have been made:

- Table 1: change of the elongation and the bending radius at 180° values for alloy EN AW-5059 temper H112;
- Table 1: change of the elongation value for alloy EN AW-5186 temper O/H111;
- Table 1: name of  $R_m$  (tensile strength),  $R_{p0,2}$  (yield strength) and  $A$  (elongation after fracture) have been completed.

CEN/TC 132 affirms it is policy that in the case when a patentee refuses to grant licenses on standardised standard products under reasonable and not discriminatory condition, then this product shall be removed from the corresponding document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

## **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.



## 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.

EN 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 and form of products*

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 Aluminium Alloys (ASSET Test)*

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

ASTM B928/B928M, *Standard Specification for High Magnesium Aluminium-Alloy Sheet and Plate for Marine Service and Similar Environments*

**SS-EN 14286:2008 (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**  
clause whose reference 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.

NOTE 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.

The designation of the tempers shall conform to EN 515.

**6 Ordering information**

The relevant requirements of EN 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 EN 485-1 shall apply.

### 7.3 Mechanical properties

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

- a) the elongation after fracture (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 0,2 % proof strength  $R_{p0,2}$  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 EN 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. [3]. The elongation after fracture  $A$  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 after fracture  $A$  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:

$$L_o = 5,65 \sqrt{S_o}$$

where

$S_o$  is the initial section of the test piece.