



SLOVENSKI STANDARD
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Aluminium and aluminium alloys - Products for structural railway applications - Technical conditions for inspection and delivery - Part 2: Plates and sheets

Aluminium und Aluminiumlegierungen - Erzeugnisse für tragende Anwendungen im Schienenfahrzeugbau - Technische Lieferbedingungen - Teil 2: Platten und Bleche

Aluminium et alliages d'aluminium - Produits pour applications ferroviaires structurelles - Conditions techniques de contrôle et de livraison - Partie 2: Tôles et tôles épaisses

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EUROPEAN STANDARD
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Aluminium and aluminium alloys - Products for structural railway applications - Technical conditions for inspection and delivery - Part 2: Plates and sheets

Aluminium et alliages d'aluminium - Produits pour applications ferroviaires structurelles - Conditions techniques de contrôle et de livraison - Partie 2: Tôles et tôles épaisses

Aluminium und Aluminiumlegierungen - Erzeugnisse für tragende Anwendungen im Schienenfahrzeugbau - Technische Lieferbedingungen - Teil 2: Platten und Bleche

This European Standard was approved by CEN on 6 May 2004.

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.

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 Central Secretariat has the same status as the official versions.

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



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Foreword

This document (EN 13981-2:2004) 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 January 2005, and conflicting national standards shall be withdrawn at the latest by January 2005.

Within its program of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 21 "Railways applications of aluminium and aluminium alloys" to prepare the following standard:

EN 13981-2, *Aluminium and aluminium alloys — Products for structural railway applications — Technical conditions for inspection and delivery — Part 2: Plates and sheets.*

This standard is part of a set of four standards. The other standards deal with:

- *Part 1: Extruded products*
- *Part 3: Castings*
- *Part 4: Forgings*

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

EN 13981-2:2004 (E)**1 Scope**

This document specifies requirements for rolled products (plate and sheet) which contribute to the structural properties of the railcar bodyshell and of other major structural components.

It specifies particular requirements regarding qualification, quality control, material properties and dimensional tolerances are specified. Furthermore, guidelines for application and use are given.

NOTE Some of the products listed in the present standard may be subject to patent or patent applications, and their listing herein does not in any way imply the granting of a licence under such patent right.

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

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 485-2, *Aluminium and aluminium alloys — Sheet, strip and plate — Part 2: Mechanical properties.*

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

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

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 structural property
property having a direct effect on the static and dynamic load carrying capability of a component or assembly

4 Ordering information

Ordering information shall be formulated as specified in EN 485-1. Reference to this document (EN 13981-2) shall be made.

If special requirements are stated in the order agreed between supplier and purchaser which differ from requirements specified or referenced in this document, then these special requirements shall apply.

5 Requirements

5.1 Production and manufacturing processes

Unless otherwise specified on the order, the production and manufacturing processes shall be left to the discretion of the manufacturer.

Unless it is explicitly stated on the order, no obligation shall be placed on the manufacturer to use the same processes for subsequent and similar orders.

5.2 Quality assurance

The manufacturer shall establish and maintain a quality management system which should be at least equivalent to EN ISO 9001.

The manufacturer shall be responsible for carrying out all inspections and tests required by this standard, prior to the shipment of the product. If the purchaser wishes to inspect the product at the manufacturer's works, he shall stipulate this at the time of placing the order.

5.3 Alloys, chemical composition and tempers

Alloys shall be selected from the following:

- EN AW-5454, EN AW-5754; EN AW-5083; EN AW-6061; EN AW-6082;
- any other alloys shall be qualified according to a mutually agreed procedure which shall consider the intended joining technique and the intended use;
- the chemical compositions of these alloys are specified in EN 573-3. In addition, the lead (Pb) content of all 6xxx series alloys shall be limited to maximum 0,01 %;
- the tempers shall be selected from those specified in EN 485-2. Other tempers shall be qualified according to a mutually agreed procedure which shall consider the intended joining technique and the intended use;
- tempers are defined in EN 515.

5.4 Mechanical properties of rolled products

Tensile strength, yield strength and elongation of plate and sheet shall conform to the requirements of EN 485-2 unless otherwise agreed upon between supplier and purchaser and stated on the order.

5.5 Freedom from surface defects

Surface quality shall comply with the requirements of EN 485-1.

5.6 Tolerances on dimensions and form

The tolerances on dimensions and form are specified in EN 485-3 and EN 485-4.

6 Sampling and test methods

Sampling and test methods shall comply with the requirements according to EN 485-1.

EN 13981-2:2004 (E)**7 Traceability**

The supplier shall establish and maintain a system of identification and traceability of products at each stage of manufacture, inspection and delivery, including subcontracted operations and products, in order to be able to reconstitute the history of all relevant data and to attribute them to the products concerned.

In particular, the system shall cover the following areas:

- origin of materials and agreed properties;
- manufacturing operations including heat treatment;
- inspection and testing.

The system of traceability shall allow the identification any piece subjected to the same operation of manufacture or inspection.

8 Marketing of products

Unless otherwise specified on the order lots delivered shall be marked with at least the following indications:

- alloy designation;
- temper designation;
- nominal thickness;
- inspection lot number;
- manufacturer's name or symbol.

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Marking shall be applied onto the packaging. If required by the purchaser, a more comprehensive or piecewise marking shall be agreed between supplier and purchaser at the time of placing the order.

9 Inspection certificate

Unless otherwise indicated on the order the supplier shall deliver an inspection certificate 3.1.B according to EN 10204 with at least the results of chemical analysis and the obtained mechanical properties.

10 Record keeping

Unless otherwise specified on the order quality records of inspections and tests required by this document shall be kept at least during 10 years after delivery.

11 Packaging

The type of packaging shall comply with the requirements according to EN 485-1.

12 Application and use

Plate and sheet according to this document are used for structural parts of railcar bodyshells. Annex A (informative) gives guidelines for:

- the selection of alloys;
- the choice of a suitable design code;
- welding.

13 Arbitration

In cases of dispute concerning the conformity with the requirements of this document or specification cited in the order, and before rejecting the products, testing and examination shall be carried out by an arbitrator chosen by mutual agreement between supplier and purchaser.

The arbitrator's decision shall be final.

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