



SLOVENSKI STANDARD SIST EN 541:1998

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Aluminium and aluminium alloys - Rolled products for cans, closures and lids -
Specifications

Aluminium und Aluminiumlegierungen - Walzerzeugnisse für Dosen, Verschlüsse und
Deckel - Spezifikationen

Aluminium et alliages d'aluminium - Produits laminés pour boîtes, capsules rigides et
couvercles - Spécifications

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ICS:

77.150.10 Alumijski izdelki Aluminium products

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EUROPEAN STANDARD

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English version

Aluminium and aluminium alloys - Rolled products for cans, closures and lids - Specifications

Aluminium et alliages d'aluminium - Produits
laminés pour boîtes, capsules rigides et
couvercles - Spécifications

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Walzerzeugnisse für Dosen, Verschlüsse und
Deckel - Spezifikationen

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CEN

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

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Foreword

This European Standard has been prepared by the Technical Committee CEN/TC 132 "Aluminium and aluminium alloys", the secretariat of which is held by AFNOR.

The Annex A is normative and contains "List of aluminium and aluminium alloys", the Annex B is normative and contains "Rules for rounding" and the Annex C is informative and contains "Temper designations".

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of an identical text or by endorsement, at the latest by August 1995, and conflicting national standards shall be withdrawn at the latest by August 1995.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

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1 Scope

This European Standard specifies the technical conditions for inspection and delivery, mechanical properties, dimensional tolerances and other requirements for rolled products made from wrought aluminium and aluminium alloys in thicknesses from 0,150 mm to 0,500 mm for the manufacturing of rigid cans, closures, lids and tabs.

2 Normative references

This European Standard incorporates by dated and 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 515 Aluminium and aluminium alloys - Wrought products - Temper designations
- EN 573-1 Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 1: Numerical designation system
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- EN 573-2 Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 2: Chemical symbol based designation system
- EN 573-3 Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 3: Chemical composition
- EN 602 Aluminium and aluminium alloys - Wrought products - Chemical composition of the metal used for the production of materials and articles intended to be in contact with food
- EN 10002-1 Metallic materials - Tensile testing - Part 1: Method of test (at ambient temperature)
- EN 10204 Metallic products - Types of inspection documents

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 sheet: Flat rolled product of rectangular cross section with uniform thickness, supplied in straight lengths (i.e. flat) with trimmed edges.

3.2 length of sheet: The length is always the dimension in the rolling direction.

3.3 width of sheet: The width is always the dimension at right angles to the rolling direction (see 6.2.2, figure 1).

3.4 strip: Flat rolled product of rectangular cross section with uniform thickness, supplied in coils usually with trimmed edges.

NOTE: Strip is sometimes termed "coil".

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3.5 master coil: Coil produced from one ingot.

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3.6 inspection lot: Consignment, or part thereof, submitted for inspection, comprising products of the same grade or alloy, form, temper, thickness or cross section, and processed in the same manner.

3.7 sample: One or more products taken from an inspection lot.

3.8 specimen: One or more pieces taken from each product in the sample, for the purpose of producing test pieces.

3.9 test piece: Piece taken from each specimen and suitably prepared for test.

3.10 test: Operation to which the test piece is subjected in order to measure or classify a property.

4 Technical conditions for inspection and delivery

4.1 Orders or tenders

The order or tender shall define the product required and shall contain the following information:

- a) the type and form of the product:
 - the form of the product (sheet or strip);
 - the surface finish (see clause 7);
 - the application;
 - the designation of the aluminium or aluminium alloy in accordance with EN 573-1 and/or EN 573-2;
- b) the metallurgical temper of the material:
 - temper designation in accordance with EN 515 (see also annex C);
 - for H1x tempers: delivery in accordance with table 1 and/or table 2;
- c) the number of this standard or a specification number or, where none exists, the properties agreed between supplier and purchaser;
- d) the dimensions of the product, (in millimetres):
 - thickness (to three decimal places);
 - width;
 - length;
 - internal and external diameters of the coil or reel;
 - core size and type;

For the further processing of the sheet, usually one dimension is critical demanding a tight tolerance. As the width tolerance is usually the tighter one, the purchaser shall state the critical dimension as width of the sheet.

Designation of sheet dimension shall always be in the following sequence: thickness x width x length.

It is recommended that the width be indicated by a W after the actual dimension if the width is greater than the length, (see 6.2.2, figure 1).

EXAMPLES: 0,300 mm x 750 mm x 1 000 mm
0,300 mm x 1 000 mm (W) x 750 mm

- e) quantity:
 - mass, area or number of pieces;

- f) any requirements for inspection documents;
- g) any special requirements for packaging:
 - mass per coil and per packaging unit;
 - number of sheets per stack;
 - position of coil axis (vertical or horizontal);
 - direction of winding (see clause 9);
 - design of pallet;
- h) any special requirements agreed between the supplier and the purchaser:
 - marking of products;
 - flagging of joints.

4.2 Requirements

4.2.1 Production and manufacturing processes

Unless otherwise specified in the order, the production and manufacturing processes shall be left to the discretion of the producer. Any changes in the processes for subsequent and similar orders which significantly affect the properties of the product, whether or not specified in this standard, shall be agreed by the purchaser.

4.2.2 Quality control

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The supplier shall be responsible for the performance of all inspection and tests required by this European Standard and/or the particular specification prior to the shipment of the product.

4.2.3 Chemical composition

The chemical composition shall comply with EN 573-3 and EN 602.

4.2.4 Freedom from defects

The product shall be free from defects prejudicial to its suitable and proper use.

4.3 Test procedure

4.3.1 Sampling

4.3.1.1 Specimens for chemical analysis

The specimens for chemical analysis shall be taken at the time of casting. Their shape and conditions of production (i.e. mould design, cooling rate, mass) shall be so designed that their composition is homogeneous, and be adapted to the method of analysis.

4.3.1.2 Specimens for mechanical testing

4.3.1.2.1 Number of specimens

Unless otherwise specified, at least one specimen shall be taken from each master coil of an inspection lot.

4.3.1.2.2 Location and size

Specimens shall be taken from samples in such a way that it is possible to orientate the test pieces parallel to the rolling direction (longitudinal direction).

The specimens shall be sufficiently large to allow manufacture of the test pieces necessary to carry out the required tests and shall include sufficient metal to allow manufacture of test pieces for any retests required.

4.3.1.2.3 Identification of specimens

Each specimen shall be marked in such a way that, after removal, it is still possible to identify the product from which it was taken and its location and orientation.

4.3.1.3 Test pieces for tensile test

4.3.1.3.1 Number of test pieces

One test piece shall be taken from each specimen for the tensile test. The shapes and dimensions for tensile test pieces shall comply with EN 10002-1.

4.3.1.3.2 Identification of test pieces

Each test piece shall be marked in such a manner that it is possible to identify the inspection lot from which it was taken and if required, its location and orientation in the product.

4.3.1.3.3 Machining

Any machining necessary shall be carried out in such a manner that it does not change the characteristics of the metal in the test piece.

4.3.1.4 Test pieces for other tests

For any other tests (e.g. earing, thickness or weight of coatings, lubricants) the procedures shall be agreed between supplier and purchaser.

4.3.2 Test methods

4.3.2.1 Chemical composition

Methods of analysis shall be at the discretion of the supplier. In case of dispute concerning the chemical composition, referee analysis shall be carried out by the methods specified in the relevant European Standards and the results obtained by these methods shall be accepted.

If the analysis is to be made on the sheet itself a piece of the sheet shall be dissolved and a wet analysis carried out.

4.3.2.2 Tensile test

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The tensile test shall be carried out in accordance with EN 10002-1 on test pieces with a reduced section 12,5 mm wide taken parallel to the rolling direction (longitudinal direction). The elongation shall be measured on an original gauge length of 50 mm. Mechanical properties after simulated lacquer stoving shall be determined after heat treating the test pieces at 205 °C for 20 min in a laboratory furnace.

For determination of compliance, yield strength and tensile strength values shall be rounded to the nearest 1 MPa and elongation values to the nearest 0,1 % using the rounding rules given in annex B.

4.3.2.3 Measurement of dimensions

The dimensions shall be measured by means of measuring instruments which are accurate to 1/5 of the relevant tolerance.

All dimensions shall be checked at the ambient temperature of the workshop or laboratory, and, in case of dispute, at a temperature of (20 \pm 2) °C.