



# SLOVENSKI STANDARD SIST EN 13195-1:2004

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Aluminium and aluminium alloys - Wrought and cast products for marine applications  
(shipbuilding, marine and offshore) - Part 1: Specifications

Aluminium und Aluminiumlegierungen - Knetzeugnisse und Gussstücke für  
Seewasseranwendungen (Schiffbau, Meeres- und Offshoretechnik) - Teil 1:  
Spezifikationen

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Aluminium et alliages d'aluminium - Produits corroyés et pièces moulées pour  
applications marines (construction navale, maritime et offshore) - Partie 1: Spécifications

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 13195-1**

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English version

**Aluminium and aluminium alloys - Wrought and cast products for  
marine applications (shipbuilding, marine and offshore) - Part 1:  
Specifications**

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und Gussstücke für Seewasseranwendungen (Schiffbau,  
Meeres- und Offshoretechnik) - Teil 1: Spezifikationen

This European Standard was approved by CEN on 29 May 2002.

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 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 Management Centre has the same status as the official versions.

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document EN 13195-1:2002 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 February 2003, and conflicting national standards shall be withdrawn at the latest by February 2003.

Within its programme of work Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 16 "*Marine applications*" to prepare the following standard:

EN 13195-1, *Aluminium and aluminium alloys - Wrought and cast products for marine applications (shipbuilding, maritime and offshore) – Part 1: Specifications.*

EN 13195 consists of the following parts under the general title "*Aluminium and aluminium alloys – Wrought and cast products for marine application (shipbuilding, maritime and offshore)*"

- *Part 1: Specifications;*
- *Part 2: Qualification of new products;*
- *Part 3: Welding consumables.*

Annex A is informative.

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

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**EN 13195-1:2002 (E)****1 Scope**

This European Standard specifies properties and technical conditions for inspection and delivery of wrought and cast aluminium and aluminium alloy products recommended for marine applications such as shipbuilding, maritime and offshore applications.

It applies to flat rolled products (sheet, strip and plate), extruded products (rod/bar, tube and profile), cold drawn products (rod/bar and tube), forgings and castings.

This document is to be used in conjunction with relevant European, national or international regulations as applicable, to which it comes in support.

This part of this European Standard covers:

- wrought products in aluminium alloys for structural applications (see clauses 3 and 4);
- wrought products in aluminium and aluminium alloys for non-structural applications (see clauses 3 and 5);
- rivets in aluminium alloys (see clause 5);
- castings in aluminium alloys (see clause 6).

NOTE 1 Information is given in annex A to guide the user in the selection of aluminium and aluminium alloys and tempers for various applications, including the corrosion behaviour, the welding, riveting, machining and forming properties.

NOTE 2 Some of the products listed in the present standard can 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 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 shall be removed from the corresponding standard.

**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 (including amendments).

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 shape and dimensions 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 573-4, *Aluminium and aluminium alloys - Chemical composition and form of wrought products - Part 4: Forms of products.*

- EN 586-1, *Aluminium and aluminium alloys - Forgings - Part 1: Technical conditions for inspection and delivery.*
- EN 586-2, *Aluminium and aluminium alloys - Forgings - Part 2: Mechanical properties and additional property requirements.*
- EN 586-3, *Aluminium and aluminium alloys - Forgings - Part 3: Tolerances on dimensions and form.*
- EN 754-1, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 1: Technical conditions for inspection and delivery.*
- EN 754-2, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 2: Mechanical properties.*
- EN 754-3, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 3: Round bars, tolerances on dimensions and form.*
- EN 754-4, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 4: Square bars, tolerances on dimensions and form.*
- EN 754-5, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 5: Rectangular bars, tolerances on dimensions and form.*
- EN 754-6, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 6: Hexagonal bars, tolerances on dimensions and form.*
- EN 754-7, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 7: Seamless tubes, tolerances on dimensions and form.*
- EN 754-8, *Aluminium and aluminium alloys - Cold drawn rod/bar and tube - Part 8: Porthole tubes, tolerances on dimensions and form.*
- EN 755-1, *Aluminium and aluminium alloys - Extruded rod/bar tube and profiles - Part 1: Technical conditions for inspection and delivery.*
- EN 755-2, *Aluminium and aluminium alloys - Extruded rod/bar tube and profiles - Part 2: Mechanical properties.*
- EN 755-3, *Aluminium and aluminium alloys - Extruded rod/bar tube and profiles - Part 3: Round bars, tolerances on dimensions and form.*
- EN 755-4, *Aluminium and aluminium alloys - Extruded rod/bar tube and profiles - Part 4: Square bars, tolerances on dimensions and form.*
- EN 755-5, *Aluminium and aluminium alloys - Extruded rod/bar tube and profiles - Part 5: Rectangular bars, tolerances on dimensions and form.*
- EN 755-6, *Aluminium and aluminium alloys - Extruded rod/bar tube and profiles - Part 6: Hexagonal bars, tolerances on dimensions and form.*
- EN 755-7, *Aluminium and aluminium alloys - Extruded rod/bar tube and profiles - Part 7: Seamless tubes, tolerances on dimensions and form.*
- EN 755-8, *Aluminium and aluminium alloys - Extruded rod/bar tube and profiles - Part 8: Porthole tubes, tolerances on dimensions and form.*
- EN 755-9, *Aluminium and aluminium alloys - Extruded rod/bar tube and profiles - Part 9: Profiles, tolerances on dimensions and form.*
- EN 1301-1, *Aluminium and aluminium alloys - Drawn wire - Part 1: Technical conditions for inspection and delivery.*
- EN 1301-2, *Aluminium and aluminium alloys - Drawn wire - Part 2: Mechanical properties.*

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EN 1301-3, *Aluminium and aluminium alloys - Drawn wire - Part 3: Tolerances on dimensions.*

EN 1559-1, *Founding - Technical conditions of delivery - Part 1: General.*

EN 1559-4, *Founding - Technical conditions of delivery - Part 4: Additional requirements for aluminium alloy castings.*

EN 1592-1, *Aluminium and aluminium alloys - HF-seam welded tubes - Part 1: Technical conditions for inspection and delivery.*

EN 1592-2, *Aluminium and aluminium alloys - HF-seam welded tubes - Part 2: Mechanical properties.*

EN 1592-3, *Aluminium and aluminium alloys - HF-seam welded tubes - Part 3: Tolerances on dimensions and form for circular tubes.*

EN 1592-4, *Aluminium and aluminium alloys - HF-seam welded tubes - Part 4: Tolerances on dimensions and form for square, rectangular and shaped tubes.*

EN 1706, *Aluminium and aluminium alloys - Castings - Chemical composition and mechanical properties.*

EN 10204, *Metallic products - Types of inspection documents.*

EN 12020-1, *Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 - Part 1: Technical conditions for inspection and delivery.*

EN 12020-2, *Aluminium and aluminium alloys - Extruded precision profiles in alloys EN AW-6060 and EN AW-6063 - Part 2: Tolerances on dimensions and form.*

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

ASTM G66-99, *Standard Test Method for Visual Assessment of Exfoliation Corrosion Susceptibility of 5xxx Series Aluminium Alloys (ASSET Test).*

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**3 Terms and definitions**

For the purposes of this European Standard, the terms and definitions given in EN 12258-1 and the following apply.

**3.1****structural application**

application for which the mechanical properties of the products have particular importance for the performance of the structure and for which a design calculation is generally required

**3.2****non-structural application**

application for secondary elements such as equipment and accessories

**4 Wrought aluminium alloy products for structural applications****4.1 Alloys, product forms and tempers**

The aluminium alloys recommended for welded or mechanically joined structural components exposed to a marine environment are given in Table 1.

The chemical composition of these alloys shall be as specified in EN 573-3.

For each wrought alloy and product form available, the recommended tempers are given in Table 1.



The available product form of each alloy shall be as given in EN 573-4.

Temper designations for wrought products shall be used as specified in EN 515.

## 4.2 Mechanical properties

The mechanical properties of the different products shall be as specified in the following European Standards for general engineering applications : EN 485-2, EN 586-2, EN 754-2, EN 755-2, EN 1301-2, EN 1592-2.

NOTE Classification Societies can put stricter requirements on products intended to be used in constructions inspected by them.

If the products are intended to be used in constructions inspected by a Classification Society, the purchaser shall indicate this on the order. In this case, the mechanical properties specified in Table 4 (as delivered products) and Table 6 (after welding) shall apply as minimum requirements. Still stricter requirements can be agreed upon between manufacturer and purchaser in writing.

## 4.3 Tolerances on dimensions and form

The tolerances on dimensions and form for each form of product shall be as specified in the following European Standards for general engineering applications : EN 485-3, EN 485-4, EN 586-3, EN 754-3, EN 754-4, EN 754-5, EN 754-6, EN 754-7, EN 754-8, EN 755-3, EN 755-4, EN 755-5, EN 755-6, EN 755-7, EN 755-8, EN 755-9, EN 1301-3, EN 1592-3 and EN 1592-4.

NOTE Classification Societies can put stricter requirements on products intended to be used in constructions inspected by them.

If the products are intended to be used in constructions inspected by a Classification Society, the purchaser shall indicate this on the order. In this case, the following tolerances shall apply as minimum requirements:

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- sheet, strip and plate: <https://standards.iteh.ai/catalog/standards/sist/907b137-b7a8-40c7-b4f2-71f2880cae3/sist-en-13195-1-2004>
  - permissible under-thickness shall be as specified in Table 5, while the total tolerance range shall conform to the requirements of the relevant parts of EN 485 (part 3 or 4) ;
- rod/bar and tube:
  - permissible under-thickness shall be 5 % of the material thickness, limited to 0,5 mm, while the total tolerance range shall conform to the requirements of the relevant part of EN 754 or EN 755;
- profiles:
  - permissible under-thickness shall be as specified in Table 7 ; while the total tolerance ranges shall conform to the requirements of EN 755-9;
  - wider tolerances can be agreed upon between purchaser and manufacturer for complex sections and products having a thickness below 3 mm.

Still tighter tolerances can be agreed upon between manufacturer and purchaser in writing.

## 4.4 Technical conditions for inspection and delivery

**4.4.1** The technical conditions for inspection and delivery for the various products shall be as specified in the European Standards for general engineering applications : EN 485-1, EN 586-1, EN 754-1, EN 755-1, EN 1301-1, EN 1592-1 and EN 12020-1.

In addition to the technical conditions for inspection and delivery specified in these standards, the purchaser shall indicate on the order whether or not the constructions in which the ordered products are incorporated are intended to be inspected by a Classification Society.

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If specified by the purchaser on the order, an inspection certificate 3.1.B in accordance with EN 10204 shall be issued by the manufacturer.

NOTE See 4.2, 4.3 and 4.4.4.

**4.4.2** When agreed between manufacturer and purchaser and stated on the order, tensile testing of 5xxx series alloys in H32, H34 and H36 tempers shall be carried out after heat treating the test pieces for 2 h at  $(130 \pm 5)$  °C followed by air cooling.

NOTE This treatment is to simulate the long term mechanical behaviour of these alloys in service.

After this heat treatment the mechanical properties of each test piece shall conform to the requirements of 4.2.

**4.4.3** EN AW-5083, EN AW-5383 and EN AW-5086 alloys supplied in the H116 temper in the form of sheet, strip and plate shall be subjected to testing to assess the resistance to intergranular corrosion and exfoliation corrosion. This testing shall consist of either:

- a) testing as specified in EN 485-2 supplemented in cases of doubt by the ASTM G66-99 (ASSET) test; or
- b) any other test method agreed upon between manufacturer and purchaser.

By agreement between manufacturer and purchaser, the testing to assess the resistance to intergranular corrosion and exfoliation corrosion for H116 temper material can also be applied to EN AW-5083 and EN AW-5383 alloys in tempers H32 and H34 and EN AW-5086 alloy in tempers H32 and H34 when supplied in sheet, plate and drawn tube forms.

**4.4.4** For constructions intended to be inspected by a Classification Society, the mechanical properties of products after welding shall conform to the minimum requirements specified in Table 6.

## **5 Wrought aluminium and aluminium alloy products for non-structural applications and rivets**

### **5.1 Alloys, product forms and tempers**

Aluminium and aluminium alloys recommended for welded or mechanically joined non-structural components and for rivets exposed to a marine environment are given in Table 2.

The chemical composition of these alloys shall be as specified in EN 573-3.

The recommended product forms for these alloys are also given in Table 2. They can be used in the tempers available as indicated in the relevant European Standards.

The alloys given in Table 1 may also be used for non-structural applications in all available product forms and tempers.

### **5.2 Mechanical properties**

The mechanical properties of the products shall be as specified in the European Standards for general engineering applications listed in 4.2.

NOTE Classification Societies can put stricter requirements on products intended to be used in constructions, inspected by them.

If the products are intended to be used in constructions by a Classification Society, the purchaser shall indicate this on the order. In this case, the mechanical properties specified in Table 4 (as delivered products) and Table 6 (after welding) shall apply as minimum requirements. Still stricter requirements can be agreed upon between manufacturer and purchaser in writing.

### 5.3 Tolerances on dimensions and form

The tolerances on dimensions and form for each form of products shall be as specified in the relevant European Standard for general engineering applications listed in 4.3 or EN 12020-2 for precision profiles.

NOTE Classification Societies can put stricter requirements on products intended to be used in constructions, inspected by them.

If the products are intended to be used in constructions inspected by a Classification Society, the purchaser shall indicate this on the order. In this case, the following tolerances shall apply as minimum requirements.

- sheet, strip and plate:
  - permissible under-thickness shall be as specified in Table 5, while the total tolerance range shall conform to the requirements of the relevant part of EN 485 (part 3 or 4);
- rod/bar and tube :
  - permissible under-thickness shall be 5 % of the material thickness, limited to 0,5 mm, while the total tolerance range shall conform to the requirements of the relevant part of EN 754 or EN 755;
- profiles:
  - permissible under-thickness as specified in Table 7, while the total tolerance range shall conform to the requirements of EN 755-9 and EN 12020-2 as applicable. Wider tolerances can be agreed upon between purchaser and manufacturer for complex sections and products having a thickness below 3 mm.

Still tighter tolerances can be agreed upon between manufacturer and purchaser in writing.

### 5.4 Technical conditions for inspection and delivery

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The technical conditions for inspection and delivery for the various products shall be as specified in the relevant European Standards for general engineering applications listed in 4.4.1.

In addition to the technical conditions for inspections and delivery specified in these standards, the purchaser shall indicate on the order whether or not the constructions in which the ordered products are incorporated is intended to be inspected by a Classification Society.

If specified by the purchaser on the order, an inspection certificate 3.1.B in accordance with EN 10204 shall be issued by the manufacturer.

When agreed between supplier and the purchaser and stated on the order, the criteria for quality control for 5xxx series alloys specified in 4.4.3 shall apply.

NOTE See 5.2 and 5.3.

## 6 Castings

### 6.1 Alloys, product forms and tempers

Aluminium alloys recommended for castings exposed to a marine environment are listed in Table 3.

The chemical composition of these alloys shall be as specified in EN 1706.

The recommended tempers are given in Table 3 for each alloy and casting process type available.