

Aluminium and aluminium alloys - Castings - Chemical composition and mechanical properties

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

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English Version

Aluminium and aluminium alloys - Castings - Chemical composition and mechanical properties

Aluminium et alliages d'aluminium - Pièces moulées -
Composition chimique et propriétés mécaniques

Aluminium und Aluminiumlegierungen - Gussstücke -
Chemische Zusammensetzung und mechanische
Eigenschaften

This European Standard was approved by CEN on 2 March 2020.

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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-CENELEC Management Centre has the same status as the official versions.

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European foreword

This document (EN 1706:2020) 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of an identical text or by endorsement, at the latest by October 2020, and conflicting national standards shall be withdrawn at the latest by October 2020.

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

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This document supersedes EN 1706:2010.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 23 “Revision of EN 1676 and EN 1706” to revise EN 1706:2010.

In comparison with EN 1706:2010, the following significant changes were made:

- a) Normative reference EN 10002-1 was replaced by EN ISO 6892-1;
- b) Terms and definitions were updated.
- c) In Table 1, the following alloys were deleted:
 - 1) EN AC-21200 [EN AC-Al Cu4MnMg];
 - 2) EN AC-43100 [EN AC-Al Si10Mg(b)];
- d) In Table 1, the following new alloys were added:
 - 1) EN AC-42300 [EN AC-Al Si7(Mg)];
 - 2) EN AC-42400 [EN AC-Al Si7MnMg];
 - 3) EN AC-44600 [EN AC-Al Si10Mn];
 - 4) EN AC-45600 [EN AC-Al Si7Cu1Mg0,6];
 - 5) EN AC-47200 [EN AC-Al Si12(Fe)];
 - 6) EN AC-48200 [EN AC-Al Si15Cu3MgFe];
- e) In Table 1, the maximum limit for lead was reduced to 0,29 %;
- f) In Table 1, footnotes were added and modified;
- g) In Table 1, the chemical composition limits of the alloys EN AC-43000 [EN AC-Al Si10Mg], EN AC-43300 [EN AC-Al Si9Mg] and EN AC-51300 [EN AC-AlMg5] were modified.

- h) In Table 2, the following alloys were deleted:
 - 1) EN AC-21200 [EN AC-Al Cu5MnMg];
 - 2) EN AC-43100 [EN AC-Al Si10Mg(b)];
- i) In Table 2, the following new alloys were added:
 - 1) EN AC-42300 [EN AC-Al Si7(Mg)];
 - 2) EN AC-45600 [EN AC-Al Si7Cu1Mg0,6];
 - 3) EN AC-48200 [EN AC-Al Si15Cu3MgFe];
- j) In Table 2, the mechanical properties of the already existing alloys EN AC-42100 [EN AC-Al Si7Mg0,3], EN AC-43300 [EN AC-Al Si9Mg] and EN AC-71100 [EN AC-Al Zn10Si8Mg] were modified;
- k) In Table 2, a new footnote was added;
- l) In Table 3, the following alloys were deleted:
 - 1) EN AC-21200 [EN AC-Al Cu5MnMg];
 - 2) EN AC-43100 [EN AC-Al Si10Mg(b)];
- m) In Table 3, the following new alloys were added:
 - 1) EN AC-42300 [EN AC-Al Si7(Mg)];
 - 2) EN AC-45600 [EN AC-Al Si7Cu1Mg0,6];
- n) In Table 3, the mechanical properties of the already existing alloys EN AC-46200 [EN AC-Al Si8Cu3], EN AC-43300 [EN AC-Al Si9Mg] and EN AC-71100 [EN AC-Al Zn10Si8Mg] were modified;
- o) In Table A.1, the following alloy was deleted:
 - 1) EN AC-46200 [EN AC-Al Si8Cu3];
- p) In Table A.1, the following new alloys were added:
 - 1) EN AC-42400 [EN AC-Al Si7MnMg];
 - 2) EN AC-44600 [EN AC-Al Si10Mn];
 - 3) EN AC-48200 [EN AC-Al Si15Cu3MgFe];
- q) In Table A.1 the mechanical properties of the already existing alloys EN AC-43500 [EN AC-Al Si10MnMg], EN AC-46000 [EN AC-Al Si9Cu3(Fe)] and EN AC-71100 [EN AC-Al Zn10Si8Mg] were modified;
- r) A new Annex B was added and the former Annex B renamed to Annex C;

- s) In Table C.1, the same alloys as in Table 1 were added or deleted respectively. The suitability of some casting methods was revised for some alloys as well as some rankings of properties. Footnotes were modified;
- t) The former Annex C was renamed to Annex D and Table D.1 was completely revised.

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

1 Scope

This document specifies the chemical composition limits for aluminium casting alloys and mechanical properties of separately cast test pieces for these alloys.

Annex C is included as a guide to the selection of alloys for a specific use or process.

This document is intended to be used in conjunction with EN 576, EN 1559-1, EN 1559-4, EN 1676 and EN ISO 8062-3.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 576, *Aluminium and aluminium alloys — Unalloyed aluminium ingots for remelting — Specifications*

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 1780-1, *Aluminium and aluminium alloys — Designation of alloyed aluminium ingots for remelting, master alloys and castings — Part 1: Numerical designation system*

EN 1780-2, *Aluminium and aluminium alloys — Designation of alloyed aluminium ingots for remelting, master alloys and castings — Part 2: Chemical symbol based designation system*

EN 1780-3, *Aluminium and aluminium alloys — Designation of alloyed aluminium ingots for remelting, master alloys and castings — Part 3: Writing rules for chemical composition*

EN ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature (ISO 6892-1)*

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1)*

EN 12258-1:2012, *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 12258-1:2012 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp/ui>