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I.S. EN 1706:2010

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

I.S. EN 1706:2010

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

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

Aluminium und Aluminiumlegierungen - Gußstücke - Chemische Zusammensetzung und mechanische Eigenschaften

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Foreword

This document (EN 1706:2010) 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of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

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.

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This document supersedes EN 1706:1998.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 10 "Castings" to revise EN 1706:1998.

In addition to some additional minor and editorial changes, the following technical modifications were introduced during the revision:

a) In the Scope, new reference to EN 576 was added and reference to EN ISO 8062-3 was updated.

b) New normative references were added (EN 576, EN 1559-1, EN 1559-4 and EN ISO 6506-1). Normative reference to EN 10003-1 was deleted.

c) Term and definition 3.10, order document, was added.

d) Clause 4, Ordering information, was added and subsequent numbering increased by one.

e) Second paragraph (reference to EN 576) in Clause 5.2 was added.

f) Clause 5.5, Designation to appear on drawings, was modified.

g) Clause 7.3.2.5, Pressure die cast test pieces, was modified.

h) In Clause 7.4, reference to EN ISO 6506-1 was updated from EN 10003-1.

i) In Table 1, new Alloy Group “Al” was added, including Al 99,6E and Al 99,7E grades.

j) In Table 1, the following alloys were deleted:

   1) EN AC-45200 [EN AC-Al Si5Cu3Mn];

   2) EN AC-51000 [EN AC-Al Mg3(b)];

   3) EN AC-71000 [EN AC-Al Zn5Mg].

k) In Table 1, the following new alloys were added:

   1) EN AC-21200 [EN AC-Al Cu4MnMg];

2) EN AC-43500 [EN AC-Al Si10MnMg];

3) EN AC-44500 [EN AC-Al Si12(Fe)(b)];

4) EN AC-45500 [EN AC-Al Si7Cu0,5Mg];

5) EN AC-48100 [EN AC-Al Si17Cu4Mg];

6) EN AC-51500 [EN AC-Al Mg5Si2Mn];

7) EN AC-71100 [EN AC-Al Zn10Si8Mg].

l) In Table 1, footnotes “b” to “j” were added.

m) In Table 2, the following alloys were deleted:

1) EN AC-45200 [EN AC-Al Si5Cu3Mn];

2) EN AC-51000 [EN AC-Al Mg3(b)];

3) EN AC-71000 [EN AC-Al Zn5Mg].

n) In Table 2, “Al” Alloy Group and the following alloys were added:

1) EN AC-21200 [EN AC-Al Cu4MnMg];

2) EN AC-44400 [EN AC-Al Si9];

3) EN AC-45500 [EN AC-Al Si7Cu0,5Mg];

4) EN AC-71100 [EN AC-Al Zn10Si8Mg].

o) In Table 3, the following alloys were deleted:

1) EN AC-45200 [EN AC-Al Si5Cu3Mn];

2) EN AC-51000 [EN AC-Al Mg3(b)];

3) EN AC-71000 [EN AC-Al Zn5Mg].

p) In Table 3, “Al” Alloy Group and the following alloys were added:

1) EN AC-21200 [EN AC-Al Cu4MnMg];

2) EN AC-44400 [EN AC-Al Si9];

3) EN AC-45500 [EN AC-Al Si7Cu0,5Mg];

4) EN AC-71100 [EN AC-Al Zn10Si8Mg].

q) In Table 4, EN AC-45200 [EN AC-Al Si5Cu3Mn] alloy was deleted.

r) In Table 4, “Al” Alloy Group and EN AC-48100 [EN AC-Al Si17Cu4Mg] alloy were added.

s) Former Annex A (informative) was split in Annex A (informative) and Annex B (informative).

t) In Table A.1, “Al” Alloy Group and the following alloys were added:

1) EN AC-43500 [EN AC-Al Si10MnMg];

2) EN AC-44500 [EN AC-Al Si12(Fe)(b)];

3) EN AC-48100 [EN AC-Al Si17Cu4Mg];

4) EN AC-51500 [EN AC-Al Mg5Si2Mn].

u) In Table B.1, the same alloys than in Table 1 were added and deleted. New footnote “k” was also added. The suitability for some casting methods was revised for some of the alloys.

v) New Annex C, Comparison between cast aluminium alloy designations, was added.

w) A Bibliography was also added.

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, Croatia, 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.

1 Scope

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

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

This European Standard 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 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 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 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*

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

EN ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method (ISO 6506-1:2005)*

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
casting
process in which molten metal is poured into a mould and solidified

[EN 12258-1:1998, 4.1.1]

3.2
sand casting
process in which molten metal is poured into a sand mould and solidified (at atmospheric pressure)

[EN 12258-1:1998, 4.1.8]