SLOVENSKI STANDARD
oSIST prEN 1676:2019

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Aluminij in aluminijeve zlitine - Legirani bloki za pretaljevanje - Specifikacije

Aluminium and aluminium alloys - Alloyed ingots for remelting - Specifications

Aluminium und Aluminiumlegierungen - Legiertes Aluminium in Masseln - Spezifikationen

Aluminium et alliages d'aluminium - Lingots pour refusion en aluminium allié - Spécifications

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Aluminium and aluminium alloys - Alloyed ingots for remelting - Specifications

Aluminium et alliages d'aluminium - Lingots pour refusion en aluminium allié - Spécifications

Aluminium und Aluminiumlegierungen - Legiertes Aluminium in Masseln - Spezifikationen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 132.

If this draft becomes a European Standard, 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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European foreword

This document (prEN 1676:2019) has been prepared by Technical Committee CEN/TC 132 “Aluminium and aluminium alloys”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 1676:2010.

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

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 1676:2010.

In comparison with EN 1676:2010, the following significant changes were made:

a) In subclause 6.2, the chemical composition limits, were modified.

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

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

   2) EN AB-43000 [EN AB-Al Si10Mg(a)].

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

   1) EN AB-42300 [EN AB-Al Si7(Mg)];

   2) EN AB-42400 [EN AB-Al Si7MnMg];

   3) EN AB-44600 [EN AB-Al Si10Mn];

   4) EN AB-45600 [EN AB-Al Si7Cu1Mg0,6];

   5) EN AB-47200 [EN AB-Al Si12(Fe)];

   6) EN AB-48200 [EN AB-Al Si15Cu3Mg(Fe)].

d) In Table 1, the maximum limit for lead was reduced to 0,29 %.

e) In Table 1, the minimum and maximum limit for magnesium was changed for EN AB-51300 [EN AB-AlMg5]

f) In Table 1, footnote “g” to “i” were added.

1 Scope

This document defines the requirements for grades of alloyed aluminium ingots intended for remelting.

It specifies the classifications and designations applicable to these grades, the conditions in which they are produced, their properties and the marks by which they are identified.

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 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 12258-1:2012, *Aluminium and aluminium alloys — Terms and definitions — Part 1: General terms*

EN 14242, *Aluminium and aluminium alloys — Chemical analysis — Inductively coupled plasma optical emission spectral analysis*

EN 14361, *Aluminium and aluminium alloys — Chemical analysis — Sampling from metal melts*

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 http://www.iso.org/obp

3.1
alloy
substance having metallic properties and composed of two or more elements so combined that they cannot readily be separated by physical means

[SOURCE: EN 12258-1:2012, 2.2.1]

3.2
alloying element
metallic or non-metallic element which is controlled within specific upper limits and lower limits for the purpose of giving the aluminium alloy certain special properties

[SOURCE: EN 12258-1:2012, 2.2.3]

3.3
impurity
metallic or non-metallic element present in a metal, the minimum content of which is not controlled

Note 1 to entry: Typically, the maximum concentration of an impurity in aluminium is controlled.

Note 2 to entry: Impurities are not intentionally added to the melt.

[SOURCE: EN 12258-1:2012, 2.2.4]

3.4
casting alloy
alloy primarily intended for the production of castings

[SOURCE: EN 12258-1:2012, 2.2.5]

3.5
ingot for remelting
remelt ingot
ingot intended and suitable for remelting

Note 1 to entry: Large ingots for remelting, typically having a mass of about 500 kg, are often called “sows”.

Note 2 to entry: Small ingots for remelting typically having a mass of less than 25 kg, are often called “pigs”.

[SOURCE: EN 12258-1:2012, 2.4.4]

3.6
casting
product at or near finished shape, formed by solidification of the metal in a mould or a die

[SOURCE: EN 12258-1:2012, 2.5.1]

3.7
melt
quantity of molten metal that has simultaneously undergone the same preparatory treatment in the furnace before the casting operation

[SOURCE: EN 12258-1:2012, 4.1.3]

3.8
order document
document or set of documents to which supplier and purchaser agreed at the time of ordering

Note 1 to entry: An order document may be an order of the purchaser confirmed by the supplier or a quotation of the supplier confirmed by the purchaser.

[SOURCE: EN 12258-1:2012, 3.11.10]

4 Ordering information

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

a) designation of the aluminium alloy according to this document (or the purchaser code after agreement between the supplier and the purchaser);

b) form of the product;

c) quantity:

   1) mass (in metric tonnes);

   2) tolerance quantity, if required;

d) any requirements for certificates of conformity, test and/or analysis reports or inspection certificates;

e) any additional requirements agreed between the supplier and the purchaser, such as metallurgical structure, samples, delivery details, etc.

5 Requirements

5.1 Production and manufacturing processes

Unless otherwise specified in the order document, the production and manufacturing processes shall be left to the discretion of the producer.

Unless it is explicitly stated in the order document, no obligation shall be placed on the manufacturer to use the same processes for subsequent and similar orders. However, the supplier should inform the purchaser of any change that could affect the quality of the ingots or the final products.

5.2 Quality control

The supplier shall be responsible for carrying out all inspection and tests required by the relevant European Standard and/or the particular specification, prior to shipment of the product. If the purchaser wishes to inspect the product at the supplier's works, he shall stipulate this at the time of placing the order.

5.3 Chemical composition

Each grade of alloyed aluminium ingot for remelting shall be in accordance with the designations and chemical composition specified in Table 1.

NOTE For unalloyed aluminium ingots, see EN 576.

For alloys that are not in Table 1, the writing rules for designations and chemical compositions, as specified in EN 1780-1, EN 1780-2 and EN 1780-3, shall be applied.

If the purchaser requires content limits for elements not specified in this document, these limits shall be stated on the order document, after agreement between supplier and purchaser.

Table 1 — Chemical compositions of alloyed ingots

Expressed in percentage by mass

Alloy Group	Alloy designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb[i]	Sn	Ti[d]	Others[a, e]		Aluminium
	Numerical	Chemical symbols												Each[i]	Total	
AlCu	EN AB-21000	EN AB-Al Cu4MgTi	0,15 (0,20)	0,30 (0,35)	4,2 to 5,0	0,10	0,20 to 0,35 (0,15 to 0,35)	—	0,05	0,10	0,05	0,05	0,15 to 0,25 (0,15 to 0,30)	0,03	0,10	Remainder
	EN AB-21100	EN AB-Al Cu4Ti	0,15 (0,18)	0,15 (0,19)	4,2 to 5,2	0,55	—	—	—	0,07	—	—	0,15 to 0,25 (0,15 to 0,30)	0,03	0,10	Remainder
AlSiMgTi	EN AB-41000	EN AB-Al Si2MgTi	1,6 to 2,4	0,50 (0,60)	0,08 (0,10)	0,30 to 0,50	0,50 to 0,65 (0,45 to 0,65)	—	0,05	0,10	0,05	0,05	0,07 to 0,15 (0,05 to 0,20)	0,05	0,15	Remainder
AlSi7Mg	EN AB-42000	EN AB-Al Si7Mg	6,5 to 7,5	0,45 (0,55)	0,15 (0,20)	0,35	0,25 to 0,65 (0,20 to 0,65)	—	0,15	0,15	0,15	0,05	0,20[f] (0,25)	0,05	0,15	Remainder
	EN AB-42100	EN AB-Al Si7Mg0,3	6,5 to 7,5	0,15 (0,19)	0,03 (0,05)	0,10	0,30 to 0,45 (0,25 to 0,45)	—	—	0,07	—	—	0,18[f] (0,25)	0,03	0,10	Remainder
	EN AB-42200	EN AB-Al Si7Mg0,6	6,5 to 7,5	0,15 (0,19)	0,03 (0,05)	0,10	0,50 to 0,70 (0,45 to 0,70)	—	—	0,07	—	—	0,18[f] (0,25)	0,03	0,10	Remainder
	EN AB-42300	EN AB-Al Si7(Mg)	6,5 to 7,5	0,15 (0,19)	0,03 (0,05)	0,10	0,10 to 0,30 (0,10 to 0,25)	—	—	0,07	—	—	0,18[f] (0,25)	0,03	0,10	Remainder

Alloy Group	Alloy designation		Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Pb[i]	Sn	Ti[d]	Others[a, e]		Aluminium
	Numerical	Chemical symbols												Each[i]	Total	
	EN AB-42400	EN AB-Al Si7MnMg	6,5 to 8,5	0,20 (0,25)	0,03 (0,05)	0,35 to 0,75	0,15 to 0,45 (0,10 to 0,45)	—	—	0,03	—	—	0,15[f] (0,20)	0,05	0,15	Remainder
AlSi10Mg	EN AB-43100	EN AB-Al Si10Mg(b)	9,0 to 11,0	0,45 (0,55)	0,08[g] (0,10)	0,45	0,25 to 0,45 (0,20 to 0,45)	—	0,05	0,10	0,05	0,05	0,15	0,05	0,15	Remainder
	EN AB-43200	EN AB-Al Si10Mg(Cu)	9,0 to 11,0	0,55 (0,65)	0,30 (0,35)	0,55	0,25 to 0,45 (0,20 to 0,45)	—	0,15	0,35	0,10	—	0,15 (0,20)	0,05	0,15	Remainder
	EN AB-43300	EN AB-Al Si9Mg	9,0 to 10,0	0,15 (0,19)	0,03 (0,05)	0,10	0,30 to 0,45 (0,25 to 0,45)	—	—	0,07	—	—	0,15	0,03	0,10	Remainder
	EN AB-43400	EN AB-Al Si10Mg(Fe)	9,0 to 11,0	0,45 to 0,9 (1,0)	0,08 (0,10)	0,55	0,25 to 0,50 (0,20 to 0,50)	—	0,15	0,15	0,15	0,05	0,15 (0,20)	0,05	0,15	Remainder
	EN AB-43500	EN AB-Al Si10MnMg[b]	9,0 to 11,5	0,20 (0,25)	0,03 (0,05)	0,40 to 0,80	0,15 to 0,60 (0,10 to 0,60)	—	—	0,07	—	—	0,15 (0,20)	0,05	0,15	Remainder
AlSi	EN AB-44000	EN AB-Al Si11	10,0 to 11,8	0,15 (0,19)	0,03 (0,05)	0,10	0,45	—	—	0,07	—	—	0,15	0,03	0,10	Remainder
	EN AB-44100	EN AB-Al Si12(b)	10,5 to 13,5	0,55 (0,65)	0,10 (0,15)	0,55	0,10	—	0,10	0,15	0,10	—	0,15 (0,20)	0,05	0,15	Remainder
	EN AB-44200	EN AB-Al Si12(a)	10,5 to 13,5	0,40 (0,55)	0,03 (0,05)	0,35	—	—	—	0,10	—	—	0,15	0,05	0,15	Remainder