SLOVENSKI STANDARD
SIST EN 576:2004

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Aluminium and aluminium alloys - Unalloyed aluminium ingots for remelting - Specifications

Aluminium and aluminium alloys - Unalloyed aluminium ingots for remelting - Specifications

Aluminium und Aluminiumlegierungen - Unlegiertes Aluminium in Masseln - Spezifikationen

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

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This European Standard was approved by CEN on 9 October 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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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

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Contents

Foreword

This document EN 576:2003 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of an identical text or by endorsement, at the latest by April 2004, and conflicting national standards shall be withdrawn at the latest by April 2004.

Within its programme of work, Technical Committee CEN/TC 132 entrusted CEN/TC 132/WG 1 "*Liquid metal, unalloyed and alloyed ingots*" to prepare the following standard :

EN 576, *Aluminium and aluminium alloys - Unalloyed aluminium ingots for remelting – Specifications*.

This document supersedes EN 576:1995.

This revised version specifies a modified list of grades of unalloyed aluminium together with a new designation system which is specified in a new normative annex. The revision aligns this European Standard with common rules of the international trade of unalloyed aluminium which are based on the designation system of the Aluminum Association.

Annex A is normative.

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, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the requirements for grades of unalloyed aluminium in the form of ingots for remelting.

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

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

prEN 14361, *Aluminium and aluminium alloys - Chemical analysis - Sampling from metal melts.*

prEN 14726, *Aluminium and aluminium alloys - Chemical analysis - Guideline for spark optical emission spectrometric analysis.*

3 Terms and definitions

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

4 Ordering information

The order, in the form as agreed between supplier and purchaser, shall contain the following information :

a) designation of the unalloyed aluminium according to this European Standard or the customer code ;

b) specification of the form of the product, including mass and dimensions of individual ingots and bundles ;

c) quantity :

- mass (in metric tonnes) ;
- quantity tolerances if required ;

d) any requirements differing from those specified in this European Standard, such as chemical composition ;

e) any additional requirements not specified in this European Standard, e. g. on marking and packaging of products, special inspections ;

f) any requirements for inspection documents.

If special requirements are specified in the order agreed between supplier and purchaser which differ from requirements specified in this European Standard, then these special requirements shall apply.

5 Requirements

5.1 Production and manufacturing processes

Unless otherwise specified on the order, the production and manufacturing processes shall be left to the discretion of the manufacturer.

Unless it is explicitly stated on the order, no obligation shall be placed on the manufacturer to use the same processes for subsequent and similar orders.

5.2 Quality control

The supplier shall be responsible for carrying out all inspection and tests required by this European Standard and additional requirements, 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 unalloyed aluminium with a specified minimum aluminium content, including refined aluminium, shall be in accordance with the designations and chemical composition given in Table 1.

Each grade of unalloyed aluminium without a specified minimum aluminium content shall be in accordance with the designations and chemical composition given in Table 2.

The compositions shown in Table 1 and Table 2 are given in mass percent maximum unless otherwise stated.

In interpreting the results of chemical analysis, the number representing the result of the determination of an element content shall be rounded to the same number of decimal places as the corresponding number in this standard.

The writing rules for designations and chemical composition shall be applied in accordance with annex A.

If the purchaser requires content limits for elements not specified in this European Standard, these limits shall be agreed between supplier and purchaser and stated on the order.

5.4 Freedom from defects and foreign material

The ingots shall be free from asbestos and other hazardous foreign material and shall show no indication of increased radioactivity.

To a standard agreed between supplier and purchaser, the ingots shall be reasonably free from :

a) visible surfaces defects such as grease, dirt, products of corrosion, dross or any other foreign bodies, including paint apart from that which is approved for marking purposes ;

b) metallic or non-metallic inclusions ;

c) gas porosity.

The ingots can have shrinkage holes or cracks which can retain water and shall therefore be thoroughly dried and preheated before charging to a furnace to avoid the risk of a violent explosion.

5.5 Form of products

There are several possible shapes of ingots, e.g :

— trapezoidal which can be stacked. This type of ingot can have one or more notches to enable it to be divided into pieces if required ;

— T-bars, sows or other shapes.

The tolerances of the unit masses, the shape, the dimensions and the dimensional tolerances of the individual ingots and bundles shall be defined by agreement between supplier and purchaser at the time of ordering.

6 Product inspection and testing methods

6.1 General

Sampling procedures and analytical tests shall be carried out in accordance with prEN 14726 and prEN 14361.

The melt shall be clearly identified with a traceable number. From each melt, analytical samples shall be taken during the cast from the metal distribution system. The minimum number of samples for obtaining a representative analytical result shall be justified.

Each analytical sample shall be suitably machined and, when analysed by emission spectrometry, shall be sparked at least twice. The result of the analysis of the sample shall be the arithmetic mean of the values obtained by the sparks.

Each sample shall meet the specified composition limits. The analysis of the melt shall be the arithmetic mean of the analysis results of all the samples taken from this melt.

The manufacturer shall determine and periodically check the analytical accuracy of each element analysed.

He shall be able to demonstrate the validity of the whole test procedure, including sampling, sample preparation and measurement.

6.2 Sampling and chemical analysis of main impurities

All analytical samples shall be analysed for the main impurities which are specified by the columns in Table 1 or Table 2. The analytical result shall be indicated on the certificate of analysis.

6.3 Sampling and chemical analysis of trace impurities

The trace impurities are those impurities which are not specified by the columns in Table 1 and Table 2. For the grades where maximum values of trace impurities are specified by footnotes, e.g Pb, Hg, Cd and As in Table 2, the supplier shall establish and maintain a quality plan which specifies the frequency of tests and the analytical procedure.

Small traces of Na and Li impurities can cause severe problems on casting, rolling and the quality of some special products. Therefore it is strongly recommended that the manufacturer of the ingots analyses these elements and indicates the results (in mass percent to four decimal places). For these elements and for other impurities that can cause similar problems, closer limits than those of Table 2 may be specified by agreement between supplier and purchaser.

6.4 Sampling from ingots and chemical analysis

Sampling from ingots is only appropriate when analytical data of samples from the melt, e.g of trace elements, are not available. After agreement between supplier and purchaser, analytical data from samples taken from ingots may be used as an indication of the composition of the metal provided that they are averages from samples taken from different ingots of one melt at a large number of different positions within the ingots, according to a documented and justified sampling plan.

NOTE Because of macrosegregation, the concentration of certain impurities, especially of heavy metals with a low melting point such as lead or tin, can vary to a large extent within an ingot.

7 Inspection documents

The consignment shall be accompanied by a certificate of analysis listing the results of the chemical analysis of the main impurities as specified in 6.2 and any other elements which have been requested in advance.

8 Marking of products

Each individual ingot shall be marked with the manufacturer identification.

Unless otherwise indicated on the order, each bundle of ingots and each non-bundled ingot, such as T-bar or sow, shall be marked with at least one of the following :

— the designation of the grade of unalloyed aluminium ;

— the melt number ;

— the unit mass.

The method of marking is left to the discretion of the supplier, but it shall be indelible and shall not be a source of contamination.

Each bundle of ingots or each non-bundled ingot, such as T-bar or sow should carry a warning about the risk of explosion when coming in contact with liquid metal without being dried.

9 Packaging

Small ingots shall be supplied in bundles suitable for stacking. The bundles shall be securely strapped in order to be handled without breakage.

If not otherwise agreed between supplier and purchaser, each bundle shall only consist of one melt.

10 Delivery documents

The delivery documents shall accompany the delivery and shall include :

— the manufacturer identification ;

— the order number ;

— the designation of the grade of unalloyed aluminium and of the form of the ingots ;

— the melt number(s) ;

— the results of chemical analysis for all main impurities i. e. those impurities for which specific limits are shown in the columns of Table 1 or Table 2, in the same sequence as given in the relevant tables; or other impurities if agreed between supplier and purchaser ;

— the unit and total mass.

The delivery documents should include the results of chemical analysis of sodium and lithium.

11 Complaints

Chemical and physical defects can give rise to complaints if they affect the processing or the end use of the relevant finished product.

The purchaser shall enable the supplier to check the validity of the complaint.