



National Standard of the People's Republic of China

# 中华人民共和国国家标准

GB/T 1196—202X  
Replace GB/T 1196-2017

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Unalloyed aluminium ingots for  
remelting

重熔用铝锭

*(English Translation)*

(送审稿)

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## Foreword

SAC/TC 243 is in charge of this English translation. In case of any doubt about the contents of English translation, the Chinese original shall be considered authoritative.

This document is drafted in accordance with the rules given in the GB/T 1.1—2020 *Directives for standardization -Part 1: Rules for the structure and drafting of standardizing documents*.

本文件按照 GB/T 1.1—2020《标准化工作导则 第1部分：标准化文件的结构和起草规则》的规定起草。

This document replaces GB/T 1196—2017 *Unalloyed aluminium ingots for remelting in whole*, in addition to a number of structural adjustments and editorial changes, the following technical deviations have been made with respect to the GB/T 1196—2017:

本文件代替GB/T 1196—2017《重熔用铝锭》，与GB/T 1196—2017相比，除结构调整和编辑性改动外，主要技术变化如下：

a) Added requirements for V and Ti content, changed the Zn content of Al99.85, changed the Cu content of Al99.70 (See 5.1, 3.2 of the 2017 edition);

a) 化学成分中增加 V、Ti 含量要求，更改了 Al99.85 牌号 Zn 含量、Al99.70 牌号 Cu 含量要求（见 5.1，2017 年版的 3.2）；

b) Changed the time limit for objecting to test results from suppliers during inspection and acceptance; (See 7.1.2, 5.1.2 of the 2017 edition);

b) 更改了检查和验收中需方向供方提出检验结果异议的时限（见 7.1.2，2017 年版的 5.1.2）；

c) Added sampling regulations for appearance quality inspection of aluminum ingots (See 7.4.2);

c) 增加了铝锭外观质量检验取样规定（见 7.4.2）；

d) Deleted the provisions for arbitration results processing on batch weights (See 5.6.3 of the 2017 edition);

d) 删除了仲裁结果的处理对批重的规定（见 2017 年版的 5.6.3）；

e) Changed the product mark (See 8.1.2, 6.1.2 of the 2017 edition);

e) 更改了产品标识（见 8.1.2，2017 年版的 6.1.2）；

f) Changed the quality certificate (See 8.4, 6.4 of the 2017 edition);

f) 更改了质量证明书（见 8.4，2017 年版的 6.4）；

g) Changed the content of the purchase order (or contract) (See Clause 9, Clause 7 of the 2017 edition).

g) 更改了订货单（或合同）内容（见第 9 章，2017 年版的第 7 章）。

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

请注意本文件的某些内容可能涉及专利。本文件的发布机构不承担识别专利的责任。

This document was proposed by the China Nonferrous Metals Industry Association.

GB/T 1196—202×

本文件由中国有色金属工业协会提出。

This document was prepared by SAC/TC 243 Chinese Nonferrous Metal Standardization Technical Committee.

本文件由全国有色金属标准化技术委员会（SAC/TC 243）归口。

The previous editions of this document and the documents it replaces have been released are as follows:

——The first edition was issued in 1975 as GB 1196-1975 *Unalloyed aluminium ingots for remelting*;

——The first revision was issued in 1983. The second revision was issued in 1988. The third revision was issued in 1993. The fourth revision was issued in 2002;

——The fifth revision was revised in 2008, and the entire texts of GB 12768-1991 *Electrical aluminium ingots for remelting* were incorporated. The sixth revision was issued in 2017.

—— This is the seventh revised edition.

本文件及其所代替文件的历次版本发布情况为：

——1975年首次发布为GB/T 1196—1975，1983年第一次修订，1988年第二次修订，1993年第三次修订，2002年第四次修订；

——2008年第五次修订(修订时并入了GB 12768-1991《重熔用电工铝锭》的内容)，2017年第六次修订；

——本次为第七次修订。

# Unalloyed aluminium ingots for remelting

## 1 Scope 范围

This document specifies the classification, technical requirements, test methods, inspection rules, marking, packing, transportation, storage, quality certificate and order (or contract) information of unalloyed aluminium ingots for remelting.

本文件规定了重熔用铝锭的分类、技术要求、试验方法、检验规则、标志、包装、运输、贮存、质量证明书及订货单（或合同）内容。

This document is applicable to the unalloyed aluminum ingots for remelting (herein after referred to as ingots) produced by alumina-cryolite molten salt electrolysis process.

本文件适用于氧化铝-冰晶石熔盐电解法生产的重熔用铝锭（以下简称铝锭）。

Primary molten aluminium can refer to this document.

电解原铝液参照执行。

## 2 Normative references 规范性引用文件

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.

下列文件中的内容通过文中的规范性引用而构成本文件必不可少的条款。其中，注日期的引用文件，仅该日期对应的版本适用于本文件；不注日期的引用文件，其最新版本（包括所有的修改单）适用于本文件。

GB/T 7999 *Optical emission spectrometric analysis method of aluminium and aluminium alloys*

GB/T 7999 铝及铝合金光电直读发射光谱分析方法

GB/T 8170 *Rules of rounding off for numerical values & expression and judgement of limiting values*

GB/T 8170 数值修约规则与极限数值的表示和判定

GB/T 20975 (All parts) *Methods for chemical analysis of aluminium and aluminium alloys*

GB/T 20975（所有部分） 铝及铝合金化学分析方法

GB/T 25820 *Steel strip for packing*

GB/T 25820 包装用钢带

## 3 Terms and definitions 术语和定义

There are no terms and definitions to be defined in this document.

本文件没有需要界定的术语和定义。

#### 4 Classification 分类

Products are classified into 8 designations according to the chemical composition: Al99.85, Al99.80, Al99.70, Al99.60, Al99.50, Al99.00, Al99.7E, Al99.6E.

产品按化学成分分为 8 个牌号：Al99.85、Al99.80、Al99.70、Al99.60、Al99.50、Al99.00、Al99.7E、Al99.6E。

#### 5 Technical requirements 技术要求

##### 5.1 Chemical composition 化学成分

The chemical composition of the products shall be as specified in Table 1. For the content of other impurity elements are not specified in Table 1, if the purchaser has special requirements, the supplier and the purchaser can negotiate separately.

产品的化学成分应符合表 1 的规定。对于表 1 中未规定的其他杂质元素含量，如需方有特殊要求时，可由供需双方另行协商。

Table1

Designation 牌号	Chemical composition 化学成分											
	Al <sup>a</sup> %, min. 不小于	%, max. 不大于										Total 总和
	Si	Fe	Cu	Ga	Mg	Zn	Mn	V	Ti	Others Each 其 他单个		
Al99.85	99.85	0.08	0.12	0.005	0.03	0.02	0.025	—	0.02	0.02	0.015	0.15
Al99.80	99.80	0.09	0.14	0.005	0.03	0.02	0.03	—	0.03	0.02	0.015	0.20
Al99.70	99.70	0.10	0.20	0.007	0.03	0.02	0.03	—	0.03	0.02	0.03	0.30
Al99.60	99.60	0.16	0.25	0.01	0.03	0.03	0.03	—	0.03	0.03	0.03	0.40
Al99.50	99.50	0.22	0.30	0.02	0.03	0.05	0.05	—	0.03	0.03	0.03	0.50
Al99.00	99.00	0.42	0.50	0.02	0.05	0.05	0.05	—	0.03	0.03	0.05	1.00
Al99.7E <sup>b</sup>	99.70	0.07	0.20	0.01	—	0.02	0.04	0.005	—	—	0.03	0.30
Al99.6E <sup>c</sup>	99.60	0.10	0.30	0.01	—	0.02	0.04	0.007	—	—	0.03	0.40

The analysis value is determined by rounding off Comparative law, and the rounding off rules are in accordance with GB/T 8170. The rounding off digits are consistent with the limit values listed in the table.

分析数值的判定采用修约比较法，修约规则按 GB/T 8170 的规定进行，修约数位与表中所列极限值数位一致。

Elements analysis including Cd, Hg, Pb and As are unconventional items, but their contents shall be monitored, requiring  $\omega(\text{Cd}+\text{Hg}+\text{Pb}) \leq 0.0095\%$ ;  $\omega(\text{As}) \leq 0.009\%$ .

Cd、Hg、Pb、As 元素，供方可不作常规分析，但应监控其含量，要求  $\omega(\text{Cd}+\text{Hg}+\text{Pb}) \leq 0.0095\%$ ;  $\omega(\text{As}) \leq 0.009\%$ 。

<sup>a</sup> The aluminum content is the difference between 100% and the measured value of impurity element content with numerical requirements listed in the table and the sum of other impurities greater than or equal

to 0.010%. The Rounding before summation shall be rounded off to be consistent with the limit number listed in the table. After summation, the rounding shall be rounded off to 0.0X% and then be differentiated from 100%.

铝含量为 100%与表中所列有数值要求的杂质元素含量实测值及大于或等于 0.010%的其他杂质总和的差值，求和前数值修约至与表中所列极限数位一致，求和后将数值修约至 0.0X%再与 100%求差。

<sup>b</sup>  $\omega(B) \leq 0.04\%$ ;  $\omega(Cr) \leq 0.004\%$ ;  $\omega(Mn+Ti+Cr+V) \leq 0.020\%$ 。

<sup>c</sup>  $\omega(B) \leq 0.04\%$ ;  $\omega(Cr) \leq 0.005\%$ ;  $\omega(Mn+Ti+Cr+V) \leq 0.030\%$ 。

## 5.2 Shape and weight 锭形和锭重

5.2.1 The shape of ingots are not specified, they shall be easy for packing, transportation and storage. 铝锭锭形不做统一的规定，但应适合于包装、运输和贮存的需要。

5.2.2 Each ingot weighs 15kg ± 2kg, 20kg ± 2kg or 25kg ± 2kg. Otherwise, supplier and purchaser can negotiate to indicate the weight requirement in order (or contract). 铝锭锭重为 15kg ± 2kg、20kg ± 2kg、25kg ± 2kg，或由供需双方协商，并在订货单（或合同）中注明。

## 5.3 Appearance 外观质量

5.3.1 The ingot shall be silvery. 铝锭应呈银白色。

5.3.2 Ingot surface shall be clean, without serious warping and porosity, however, slight slag inclusion is allowed. 铝锭表面应整洁，无较严重的飞边和气孔，允许有轻微的夹渣。

5.3.3 Extra requirements about appearance quality from purchaser shall be negotiated to indicate in order (or contract). 需方对铝锭的外观质量有其他要求时，由供需双方协商，并在订货单（或合同）中注明。

## 5.4 Others 其他

5.4.1 Special requirements about quality of ingots from purchaser shall be negotiated to indicate in order (or contract). 需方对铝锭质量有特殊要求时，由供需双方协商，并在订货单（或合同）中注明。

5.4.2 The temperature and slag inclusion requirements of the primary molten aluminium can be found in YS/T 1004. 原铝液的温度、夹渣等要求见 YS/T 1004。

## 6 Test Methods 试验方法

### 6.1 Chemical composition 化学成分

Chemical composition analysis shall be conducted in accordance with the provisions of GB/T 20975 (all parts) or GB/T 7999, and arbitration analysis shall be conducted in accordance with the provisions of GB/T 20975 (all parts). 化学成分分析按 GB/T 20975（所有部分）或 GB/T 7999 的规定进行，仲裁分析按 GB/T 20975（所有部分）的规定进行。

### 6.2 Shape and weight 锭形和锭重

The ingot shall be measured by weight, the shape of ingot shall be inspected visually. 铝锭应检斤计重，锭形用目视检验。

### 6.3 Appearance 外观质量

GB/T 1196—202×

Appearance shall be inspected visually. 铝锭的外观用目视检查。

#### 6.4 其他 Others

The test methods for temperature and slag inclusion of the primary molten aluminium can be found in YS/T 1004.

原铝液的温度、夹渣等试验方法见 YS/T 1004。

### 7 Inspection rules 检验规则

#### 7.1 Inspection and Acceptance 检查和验收

7.1.1 The ingot shall be inspected by the supplier's technical (quality) inspection department or a third party to ensure that the quality of the products conforms to the provisions of this document or the order (or contract), and the quality certificate shall be filled in. 铝锭应由供方技术（质量）检验部门或第三方进行检验，保证产品质量符合本文件或订货单（或合同）的规定并填写质量证明书。

7.1.2 Product inspection shall be done by the purchaser in accordance with the provisions of this document. In case of inspection result discrepancy for ingots, non-conformance terms shall be proposed to the supplier within 30 days from the product receipt date, and the supplier and the purchaser shall negotiate for a solution. If arbitration required, arbitration sampling will be conducted jointly on the purchaser. The inspection and acceptance of the primary molten aluminium shall be settled by negotiation between the supplier and the purchaser. 需方应对收到的产品按本文件的规定进行检验。如检验结果与本文件（或订货合同）的规定不符时，对于铝锭，应在收到产品之日起 30 d 内向供方提出，由供需双方协商解决。如需仲裁，在需方共同进行仲裁取样。原铝液的检查 and 验收由供需双方协商解决。

#### 7.2 Batches 组批

7.2.1 The ingots shall be submitted for inspection in batches, with each batch composed of the same batch number of products and batch weight unlimited. 铝锭应成批提交检验，每批应由同一批号的产品组成，批重不限。

7.2.2 Primary molten aluminium shall be submitted for acceptance in batches, with single ladle as a batch. 原铝液应成批提交验收，每批为单个铝液包。

#### 7.3 Inspection items 检验项目

Each batch of products shall be tested for chemical composition. The weight of a single ingot which is guaranteed by the supplier's process shall not be tested. Ingots shall also be inspected for appearance.

每批产品应进行化学成分的检验。铝锭单块锭重不做检验，由供方工艺保证。铝锭应进行外观质量的检验。

#### 7.4 Sampling and sample preparation

##### 取样和制样

##### 7.4.1 Chemical composition inspection 化学成分检验



7.4.1.1 Take one ingot from the top, middle, and bottom of any bundle of this batch. When the ingots are scattered and it is difficult to distinguish the upper, middle, and lower parts, at least 3 ingots shall be randomly sampled. 从该批铝锭任一捆上、中、下部各取一块铝锭。当铝锭散开，分不清上、中、下时，则随机取样不少于 3 块。

7.4.1.2 Use ethanol as lubricant and a 15 mm ~ 20 mm diameter drill to take samples. 用乙醇作润滑剂，采用直径 15 mm ~ 20 mm 的钻头钻孔取样。

7.4.1.3 On the large surface of the ingot, drill 3 holes along its diagonal, one at the center and the other two at a distance of about 100 mm from the corner top. The depth of each hole drilled shall not be less than two-thirds of the original thickness. Before drilling, the surface oxide layer shall be removed at least 0.5 mm thickness. 在铝锭的大面，沿其对角线钻孔 3 处，一处为中心，另两处各距角顶约 100 mm，各钻孔钻进的深度不小于原厚度的三分之二。在钻取试样前，应先清除表面氧化层，其厚度不少于 0.5 mm。

7.4.1.4 The aluminum shavings drilled shall be mixed evenly, divided by quartering after treated with magnets, with a weight of not less than 100 g. 钻取的铝屑应混匀，以磁铁处理后用四分法缩分，重量不少于 100 g。

7.4.1.5 Primary molten aluminium chemical composition sampling and sample preparation see YS/T 1004. 原铝液化学成分取样和制样见 YS/T 1004。

#### 7.4.2 Appearance inspection 外观质量检验

Inspect the appearance of ingots block by block. 铝锭外观逐块检验。

### 7.5 Determination of inspection results 检验结果的判定

7.5.1 When the chemical composition is unqualified, the batch of products is deemed unqualified, but the designation can be redetermined based on the analysis results. 化学成分不合格时，判该批产品不合格，但可按分析结果重新判定牌号

7.5.2 When the appearance of the ingot does not comply with the provisions of this document, the block is judged as unqualified. 铝锭外观质量不符合本文件规定时，判该块不合格。

## 8 Marking, Packing, transportation, storage and quality certificate 标志、包装、运输、贮存和质量证明书

### 8.1 Marking 标志

8.1.1 Each ingot shall be cast or printed with the manufacturer's logo and batch number. 每块铝锭上应浇铸或打印生产企业标志、批号。

8.1.2 Each bundle of ingots shall be provided with at least two distinct, waterproof and non-falling markings, indicating this document number, batch number, bundle number, net weight, number of blocks and designation. It is recommended to use labels indicating product name, this document number, batch number, bundle number, net weight, number of blocks, designation, production date, manufacturer name, factory site and bar code (see YS/T 1209 for coding rules).

每捆铝锭应有颜色鲜明、防水、不易脱落的标志，且不少于两处，标明本文件编号、批号、捆号、净重、块数、牌号。推荐使用标明产品名称、本文件编号、批号、捆号、净重、块数、牌号、生产日期、生产企业名称、厂址、条码（编码规则见 YS/T 1209）的标签。

8.1.3 If the purchaser has special requirements on the marking, the supplier and the purchaser shall negotiate and indicate in the order (or contract). 需方对标志有特殊要求时，由供需双方协商，并在订货单（或合同）中注明。The marking of green-power aluminium can be found in T/CNIA 0168. 认定为绿电铝的铝锭产品标识见 T/CNIA 0168。

## 8.2 Packing 包装

8.2.1 Steel strip, high-strength plastic packing tape or other materials can all be used for packing, while ensuring that the ingots are not scattered. 可采用钢带、高强度塑料包装带或其他材料打捆包装，但应保证铝锭不散捆。

8.2.2 Steel strips for packing shall be rust-proof, and their dimensions, tensile strength, elongation and other performance indicators shall comply with Table 2, and other requirements shall comply with relevant provisions of GB/T 25820. If the purchaser has special requirements, it can be separately agreed in the order (or contract). 打捆用钢带应防锈，其尺寸、抗拉强度、伸长率等性能指标应符合表 2 的规定，其他要求应符合 GB/T 25820 的有关规定。需方有特殊要求时可在订货单（或合同）中另行约定。

Table 2

Designation of Steel strip 钢带名称	thickness 厚度 mm	width 宽度 mm	tensile strength 抗拉强度 MPa	elongation 伸长率 %
Steel strip for packing 15kg±2kg ingots 15kg±2kg 铝锭打捆钢带	0.70~0.90	≥19	≥590	≥5
Steel strip for packing 20kg±2kg ingots 20kg±2kg 铝锭打捆钢带	0.90	32	≥590	≥5
Steel strip for packing 25kg±2kg ingots 25kg±2kg 铝锭打捆钢带	0.90	32	≥590	≥5

## 8.3 Transportation and storage 运输和贮存

The transportation equipment and storage area of ingots shall be clean. 铝锭的运输设备、贮存场所应清洁。

## 8.4 Quality certificate 质量证明书

Each batch of product shall be provided with a quality certificate with the following information stated:

每批产品应附有质量证明书，其上注明：

- a) 供方信息；

- b) 产品名称和牌号;
- c) 注册商标;
- d) 批号;
- e) 净重和件数;
- f) 分析检验结果及供方技术(质量)监督部门印记;
- g) 本文件编号;
- h) 出厂日期。

- a) Supplier Information;
- b) Product name and designation;
- c) Registered trademark;
- d) Batch number;
- e) Net weight and number of packages;
- f) Inspection results with the supplier's technical (quality) supervision department seal;
- g) This document number;
- h) Date of Ex-factory.

#### 9 Contract or order content 订货单(或合同)内容

The order (or contract) for the products listed in this document include the following content:

本文件所列材料的订货单(或合同)内容包括下列内容:

- a) 产品名称;
  - b) 牌号;
  - c) 净重;
  - d) 本文件编号;
  - e) 其他。
- a) Product name;
  - b) Product designation;
  - c) Net weight;
  - d) This document number;
  - e) Other.

Bibliography 参考文献

- [1] YS/T 1004 *Molten aluminum and aluminum alloys* 熔融态铝及铝合金
  - [2] YS/T 1209 *Unified coding and barcode identification for non-ferrous metal smelting products* 有色金属冶炼产品编码规则与条码标识
  - [3] T/CNIA 0168 *Guide for green-power aluminium assessment and transaction*  
T/CNIA 0168 绿电铝评价及交易导则
-