

ICS 77.120.10
CCS H61



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 40382-2021

Recycling materials for wrought aluminium alloys

再生变形铝合金原料

Issued on: August 20, 2021

Implemented on: March 1, 2022

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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1 Scope

China's national standard for wrought aluminium alloy recycling materials. It specifies the terms and definitions, the classification and the requirements. Aluminium recycling saves about ninety-five per cent of the energy of primary production, which is the largest saving of any common material, and that alone would make the trade important. The technical constraint is that aluminium alloys cannot be separated from each other once mixed, because the alloying elements cannot economically be removed from the melt - so a mixed scrap stream can only be used for casting alloys, which tolerate a wide composition, and the higher value wrought alloys need scrap that was sorted before melting. That is what this standard is about: defining the grades of wrought alloy scrap by alloy family and by contamination so that a remelter can charge them to make wrought product again, rather than downcycling everything into castings.

This document specifies the classification, requirements, test methods, inspection rules, enter-factory inspection and acceptance, packaging, transportation, storage, quality certificate and order (or contract) contents of recycling materials for wrought aluminium

alloys. This document applies to the wrought aluminium alloy raw materials for melting and casting (hereinafter referred to as raw materials) obtained after recycled aluminium is sorted and processed.

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.

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

GB/T 8005.1, Aluminium and aluminium alloy terms and definitions -- Part 1. Product and method of processing and treatment

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

GB/T 17432, Methods of sampling for analyzing the chemical composition of wrought aluminium and aluminium alloys

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 8005.1 as well as the followings apply.

3.1 recycling materials for wrought aluminium alloys The recycled aluminium is processed by sorting and other processes to obtain the deformed aluminium alloy raw material for melting and casting that meets the relevant requirements of this document.

3.3 volatile substance A substance that can be separated from raw materials by appropriate heating at a temperature below the melting point of the metal.

3.4 metal recovery rate The proportion of aluminium alloy produced after the raw materials are pretreated and smelted according to the methods specified in this document, expressed as mass fraction.

4 Classification

4.1 The raw material category, raw material description, raw material source, ingredient type and raw material packaging method are shown in Table 1.

4.2 The size specifications and net weight of the recycled aluminium ingots shall be determined by negotiation between the supplier and the purchaser. The size specifications and net weight of other raw materials are shown in Table 2.

5.1 Foreign material content

5.1.1 The raw materials shall not be mixed with flammable materials, or explosives such as abandoned bombs and shells.

5.1.4 The mass fraction of the material block covered with organic polymer coating on the surface shall be less than 5%.

5.2 Fracture structure of recycled aluminium ingot The fracture structure of the recycled aluminium ingot shall be dense and shall not contain slag or foreign materials.

6.1.1 General inspection

6.1.1.1 Compacted packages/blocks Observe whether there are foreign materials inside the compacted packages/blocks.

6.1.2 Arbitration test

6.1.2.1 Weigh the mass of the sample and record it as m .

6.1.2.2 Manually sort out the blocks with organic polymer coating on the surface, weigh them, and record them as m_1 .

6.1.2.5 Calculate the powder mass fraction w_F according to formula (2). The value is expressed in %. The calculation result is expressed to one decimal place. Round off according to the provisions of GB/T 8170.

6.1.2.6 Carefully sort out the foreign materials such as wood, paper, plastic, rubber, glass, stone, textiles, etc. by hand. If the sample is too large or if it is suspected that there are foreign materials embedded in it, it shall be broken and the embedded foreign materials shall be separated mechanically.

6.3 Radioactive contaminants For radioactive contaminant testing, see Annex G.

7 Inspection rules

7.1 Inspection and acceptance The supplier shall inspect the product before it leaves the factory. Ensure that the product quality complies with the provisions of this document and the order (or contract). Fill in the quality certificate.

7.3 Inspection items and sampling

7.3.1 Inspection items Each batch of raw materials shall be inspected for foreign material content, fracture structure of recycled aluminium ingots and radioactive contaminants.

7.4 Determination of inspection results

7.4.1 The foreign material inspection shall determine double samples in advance. When the first inspection does not meet the requirements, the second sample can be inspected. The weighted average is calculated with the first inspection result. If the weighted average calculation result is qualified, the batch is judged to be qualified; otherwise, the batch is judged to be not in compliance with the provisions of this document.

7.4.2 The fracture microstructure test of recycled aluminium ingots shall be conducted with double samples in advance. If the first test fails to meet the requirements, the second sample may be tested. If the second test result is qualified, the batch of raw materials shall be judged to be qualified, otherwise the batch shall be judged to be not in compliance with the provisions of this document.

7.4.3 If the radioactive pollutant test results are unqualified, the batch of raw materials shall be deemed not to comply with the provisions of this document.

8 Enter-factory inspection and acceptance

The purchaser shall conduct enter-factory inspection and acceptance according to Annex H.

9.1 Packaging

9.1.1 The packaging method of raw materials shall be determined by negotiation between the supplier and the purchaser and shall be specified in the order (or contract).

9.1.2 The packaging shall be labeled with the following information.

9.1.3 When the purchaser has requirements for information-based identification such as QR codes or bar codes, the content of the information-based identification shall be determined by negotiation between the supplier and the purchaser and indicated in the order (or contract).