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

GB/T 38470-2023

Replacing GB/T 38470-2019

Recycling material for copper alloy

再生铜合金原料

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Foreword

GB/T 38470-2023 was issued on 23 May 2023 by the State Administration for Market Regulation and the National Standardization Administration, and has been in force since 1 December 2023. The /T marks it as a recommended national standard.

The document carries an official English translation published by openstd; SAC/TC 243 is in charge of that translation, and the Chinese original is authoritative in case of any doubt about the English. It is drafted to the rules of GB/T 1.1-2020.

The standard replaces GB/T 38470-2019, Recycling materials for brass, in whole, and the foreword lists the technical deviations. The largest is one of scope: the 2019 edition dealt with brass, and the revision adds the categories of recycling material for bronze, for cupronickel and for high copper alloys, so the title itself moves from brass to copper alloy. The classification was restructured at the same time, from four categories and eight subcategories down to two categories - lump material and scraps - and a pretreatment process column was added to the classification table.

The vocabulary was reworked in step. Terms for copper alloy scrap, radioactive contamination, dismantling, crushing and separation, sorting and treatment were added; recycling materials for brass became recycling material for copper alloy, moisture became volatile substance, and metal brass content became physical quantity of copper alloy, with the corresponding requirements renamed; the term total metal content was deleted. Requirements for appearance quality and for hazardous wastes were added, and metal recovery rate and chemical composition were moved into the receiving inspection provisions.

1 Scope

The Chinese national specification for recycled copper alloy feedstock - the sorted and pretreated brass, bronze, cupronickel and high-copper-alloy material that goes back into copper production as raw material rather than as waste. The distinction the document draws

is the one that decides whether a shipment is a commodity or a controlled waste: copper alloy scrap is copper-containing material that has only been preliminarily sorted and may still be contaminated or mixed with non-copper material, while recycling material is what meets the requirements for direct production use after sorting and pretreatment. China restricts imports of scrap while admitting qualified recycled raw material, so this standard functions in practice as the technical gate for both domestic trade and import inspection, and its hazardous-waste and radioactive-contamination requirements are the reason the reference list reaches outside the metals standards into the GB 5085 series. It sets the classification, technical requirements, test methods, inspection rules, receiving inspection, transportation, storage and accompanying documents for the material, and gives every grade a code - RHCu for brass, RQCu for bronze, RBCu for cupronickel, RGCu for high copper alloys - so that a grade can be named unambiguously in a contract. It replaces GB/T 38470-2019, which covered only brass, and the revision widened the standard to copper alloys generally.

Clause 1 states that the document specifies the classification, technical requirements, test methods, inspection rules, receiving inspection, transportation, storage and accompanying documents of recycling material for copper alloy, which the text thereafter calls simply recycling material.

Its field of application is stated in a single line: the document applies to recycling material for copper alloy.

2 Normative references

Eleven documents are cited normatively, and their content forms essential clauses of this standard. For dated citations only the edition named applies; for undated citations the latest edition applies, together with any amendments.

The whole of the GB 5085 series on the identification of hazardous wastes is brought in - corrosivity, acute toxicity screening, extraction toxicity, ignitability, reactivity and toxic substance content - which is what allows the standard to require that recycling material is not a hazardous waste rather than merely describing its metal content. SN/T 0570-2023, the inspection rules for radioactive contamination of imported recycling raw materials, sits alongside them and supplies the definition of radioactive contamination used in clause 3.

Chemical composition is referred to three analytical documents: GB/T 5121 in all its parts for the chemical analysis of copper and copper alloys, YS/T 482 for atomic emission spectrometry and YS/T 483 for wavelength-dispersive X-ray fluorescence spectrometry. GB/T 8170 supplies the rounding rules and the treatment of limiting values.

3 Terms and definitions

Sixteen terms are defined, and between them they carry most of the commercial weight of

the standard, because they decide what a batch is and how its value is measured.

The two governing terms are set against each other. Copper alloy scrap is copper-containing material that has been only preliminarily sorted for copper alloy recycling and may be contaminated or mixed with non-copper material. Recycling material for copper alloy is material that meets the requirements for direct production and utilisation after the sorting and pretreatment of copper alloy scrap - the qualified product this standard governs. A note records that copper alloys here mean mainly brass, bronze, cupronickel and high copper alloys.

A second group defines what must be got out of the material and how much of it is left. Foreign substance is non-metallic material brought in during production, collection, packaging and transportation, with a note listing waste wood, paper, plastic, rubber and glass, stones and powdery substances such as dust, sludge, crystallized salt, metallic oxide and fibre powder, while excluding packaging and transport materials. Non-copper metal is metallic material other than copper and copper alloys brought in the same way, generally free iron, aluminium and aluminium alloys, zinc and zinc alloys. Volatile substance covers moisture, grease, emulsion and the like that separate naturally after proper heat treatment at 350 degrees C. Coating means organic material on the surface, such as marking or anti-rust paint and insulation layers; plating means surface metal such as nickel, tin, zinc, aluminium or chromium.

Two yield terms follow, both expressed as mass fractions. The physical quantity of copper alloy is the amount of copper alloy left relative to the mass of the original sample once foreign substance, volatile substance and non-copper metal are removed. The metal recovery rate is the mass of the cast block relative to the mass of the original sample after that same pretreatment. Alongside them sit the sampling terms - representative sample, able to represent the whole batch, and chemical composition sample, taken directly or made after melting to determine copper and other element contents.

The clause closes with the process vocabulary added in this revision: dismantling, separating copper-containing parts from copper alloy scraps; crushing and separation, shredding and separating those parts further by special equipment; sorting, by shape and alloy type once foreign substance has been removed; and treatment, the cleaning or degreasing, drying and packing of the sorted parts. Radioactive contamination is defined from SN/T 0570-2023 as undesirable radioactive substance on the surface in excess of its natural amount, causing technical complications or radiation hazards.

4 Classification

Recycling material is divided into two categories, lump material and scraps, according to type, appearance features, source and pretreatment process.

Table 1 sets out the categories, names and codes. Lump material carries four named

grades: brass lump material, coded RHCu-1A, RHCu-1B, RHCu-1C and RHCu-1D; bronze lump material, coded RQCu-1A, RQCu-1B and RQCu-1C; cupronickel lump material, coded RBCu-1A and RBCu-1B; and high copper alloys lump material, coded RGCu-1A and RGCu-1B. The scraps category takes a single code each: brass scraps RHCu-2, bronze scraps RQCu-2, cupronickel scraps RBCu-2 and high copper alloys scraps RGCu-2.

Table 2 then classifies each of those codes in full, adding for every grade its appearance features, the source of the recycling material and the pretreatment process it must have undergone. Lump material is described as the copper alloy lump obtained from recovered copper alloy raw material after dismantling, crushing, sorting and other processing, and includes plates, strips, sheets, foils, tubes, rods, wires and profiles. The source column distinguishes, for example, surplus and unqualified pure brass from copper processing and downstream enterprises, or brass wire that has failed in service, from gloss plated material, from brass pipe recovered from building pipes, condensers and radiators, from the valves, water meters, plumbing appliances, connectors, ornaments and broken material recovered from machinery, vehicles, household appliances, sanitary appliances and architectural decoration. The pretreatment column pairs each with the sequence required, from sorting and packaging alone, through dismantling then sorting then packaging, to dismantling, crushing and separation, then packaging.