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

GB/T 728-2020

Tin ingot

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009. This Standard replaces GB/T 728-2010 "Ingot tin". Compared with GB/T 728- 2010, the major changes of this Standard are as follows: -- Modify the lead content in the chemical composition of the designation Sn99.90A from $\leq 0.032\ 0\%$ to $\leq 0.025\ 0\%$ (see Table 1; Table 1 of version 2010); -- Modify the bismuth content in the chemical composition of the designations Sn99.90A and Sn99.90AA, from $\leq 0.015\ 0\%$ to $\leq 0.020\ 0\%$ (see Table 1; Table 1 of version 2010); -- Modify the silver content in the chemical composition of the designations Sn99.95A, Sn99.95AA, and Sn99.99A, from $\leq 0.000\ 1\%$ to $\leq 0.000\ 5\%$ (see Table 1; Table 1 of version 2010); -- Modify the sulfur content in the chemical composition of the designations Sn99.90A, Sn99.90AA, Sn99.95A, and Sn99.95AA, from $\leq 0.000\ 5\%$ to $\leq 0.001\ 0\%$; delete the fixed value of the sulfur content in the chemical composition of the designation Sn99.99A (See Table 1; Table 1 of version 2010); -- Delete definitions, symbols, units and abbreviations (see Chapter 3 of version 2010); -- Add arbitration sampling and preparation methods (cutting method) (see 5.4.2.2); -- Add the marking method of packaging into bundles, which is recommended to be performed according to YS/T 1209 (see 6.1.2). This Standard was proposed by the China Nonferrous Metals Industry Association. This Standard shall be under the jurisdiction of National Technical Committee 243 on Nonferrous Metals of Standardization Administration of China (SAC/TC 243). The drafting organizations of this Standard: Yunnan Tin Group (Holding) Co., Ltd., Guangxi China Tin Group Co., Ltd., Yunnan Chengfeng Non-ferrous Metals Co., Ltd., China

Nonferrous Metals Techno-Economic Research Institute. Tin ingot

1 Scope

China's national standard for tin ingot. Tin is produced in small quantity compared with the base metals and it is indispensable in a way that quantity does not reflect: most of it goes into solder, which is what holds together every electronic assembly in the world, and the rest into tinplate, bronze and chemicals. China is the largest producer, and the ingot traded here is the form in which refined tin moves. Purity is the whole specification, and the impurities that matter are specific rather than general. Lead is limited because lead-free solder is a legal requirement in electronics and the tin is where lead would come from; antimony, bismuth and copper alter the solder's melting behaviour and its wetting; and iron and arsenic affect the joint's appearance and reliability. The standard specifies the technical requirements, test methods, inspection rules, marking, packaging, transport, storage, quality certificate and purchase order contents, and applies to tin ingot produced by pyrometallurgical or electrolytic refining.

This Standard specifies the technical requirements, test methods, inspection rules, marking, packaging, transportation, storage, quality certificate and purchase order (or contract) contents of tin ingot. This Standard applies to tin ingot products which are produced by pyrolysis or electrolysis refining.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only the dated version applies to this document. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 3260, Methods for chemical analysis of tin

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

3 Technical requirements

3.1 Product classification According to the chemical composition and impurity lead content of tin ingots, it is divided into three designations: Sn99.90, Sn99.95, Sn99.99, and two grades: A high lead and AA low lead.

3.2 Chemical composition The chemical composition of tin ingot shall meet the requirements of Table 1.

5.1 Inspection and acceptance

5.1.1 The product shall be inspected by the supplier to ensure that the product quality

complies with the requirements of this Standard and the purchase order (or the contract); the supplier shall fill in the quality certificate.

5.1.2 The buyer shall inspect the received products in accordance with the provisions of this Standard. If the test result is inconsistent with the provisions of this Standard or the purchase order (or contract), a written form shall be submitted to the supplier; the issue shall be settled by negotiation between the supplier and the buyer. Objections of appearance quality shall be filed within one month from the date of receipt of the product; objections of other performances shall be filed within three months from the date of receipt of the product. If arbitration is required, it shall be determined through negotiation between the supplier and the buyer.

5.2 Batch Products shall be submitted for acceptance in batches; each batch shall be composed of products of the same designation and the same grade. The weight of each batch of ingots shall not exceed 50 t.

5.3 Inspection items Each batch of products shall be inspected for chemical composition, appearance quality, ingot shape and ingot weight. If there are special requirements, the buyer shall indicate in the purchase order (or contract).

5.4.1 Production sampling and sample preparation

5.4.1.1 The sampling tools shall be cleaned and preheated before sampling. When the casting conditions are reached, respectively take samples before, during and after the casting process of each batch of products to cast specimen. The volume of each sub-sample is not less than 150 g.

5.4.1.2 When preparing the sample, the epidermis shall be removed to ensure that the sample is smooth and flat. Use the sawing method (do not use any lubricant) to make the sample into a chip not larger than 4 mm; use a magnet to remove the scrap iron which is brought in during processing; mix well and divide it to no less than 20 g as the tin ingot samples of this batch; when using the mechanical method (no lubricants are allowed), make the samples into smooth and flat to-be-tested samples.

b) Product name:

c) Designation, grade;

d) Production batch number;

e) Bundle number;

g) Number of ingots;

h) Place of origin.

6.2 Packaging, transportation, storage

6.2.1 Pack the tin ingots in bundles, or pack as required by the buyer's contract.

6.2.2 The tin ingots shall be protected from rain and chemical agents during transportation and storage. The long-term storage temperature shall not be lower than 13.2 °C.

6.3 Quality certificate Each batch of tin ingots is accompanied by a quality certificate, which indicates:

- a) Supplier's name, address, telephone, fax;
- b) Product name, trademark;
- c) Designation, grade, batch number;
- d) Net weight and number of pieces;
- e) Analysis and inspection results and the imprint of the technical supervision department;
- f) Code of this Standard;
- g) Date of delivery.

7 Purchase order (or contract) contents

The purchase order (or contract) for tin ingots which is listed in this Standard shall include the following:

- a) Product name;