

ICS 77.150.01
CCS H62



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

GB/T 20424-2025

Replacing GB 20424-2006

**Specification for the limits on harmful element content of heavy
non-ferrous metal concentrate products**

重有色金属精矿产品中有害元素的限量规范

Issued on: February 28, 2025

Implemented on: September 1, 2025

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

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Foreword

This Document was drafted as per the rules specified in GB/T 1.1-2020 Directives for Standardization - Part

1. Rules for the Structure and Drafting of Standardizing Documents. This Document replaced GB/T 20424-2006 The Specification for Limit on Harmful Element Content of the Heavy Metal Concentrates Products. Compared with GB/T 20424-2006, the major technical changes of this Document are as follows besides the structural adjustments and editorial modifications.

a) Change the terms and definitions of some concentrates; and add the term and definition of "antimony concentrate" (see Clause 3 of this Edition; Clause 3 of the 2006 Edition);

b) Change the limit of As in lead concentrate from 0.70% to 0.60% (see

4.2 of this Edition;

4.2 of the 2006 Edition);

c) Add the limits of Cd and Tl in lead concentrate to 0.40% and 0.02% respectively (see 4.2 of this Edition);

d) Change the limit of As in zinc concentrate from 0.60% to 0.50% (see

4.3 of this Edition;

4.3 of the 2006 Edition);

e) Add the limit of Tl in zinc concentrate to 0.02% (see

4.3 of this Edition);

f) Add the limit of TI in lead and zinc bulk concentrate to 0.02% (see

1 Scope

China's national limits on the harmful elements contained in heavy non-ferrous metal concentrates. It specifies the limit requirements, the test methods and the inspection rules for harmful elements in heavy non-ferrous metal concentrate products, and it applies to those products. A copper, lead, zinc or tin concentrate is sold on its payable metal, but what accompanies that metal decides whether a smelter can treat it at all. Arsenic, cadmium, mercury, thallium, fluorine and chlorine are the elements at issue, and each is a different problem. Arsenic and mercury volatilise in roasting and smelting and have to be captured; if they are not, they leave in the gas or in the effluent. Fluorine and chlorine attack the refractories and the acid plant and corrode the gas cleaning train. Cadmium and thallium report to the dusts and the residues, and thallium in particular is acutely toxic at low concentration and has been the cause of serious pollution incidents around Chinese smelters. A concentrate that exceeds what the plant was designed for is not a quality problem for the buyer but a regulatory and environmental one, and by the time it is discovered the material is already in the country and in the yard. Setting national limits therefore does two things at once: it bounds what a domestic mine may sell, and it gives customs and the importer a basis for rejecting a cargo. The 2025 edition tightened several of them, among them the cadmium and thallium limits in lead concentrate, now 0.40 per cent and 0.02 per cent. The test methods are referred to the analytical standards for each concentrate type, and the inspection rules fix the sampling and the acceptance. Issued on 28 February 2025 and in force since 1 September 2025, it replaces GB 20424-2006.

This Document specifies the limit requirements, test methods and inspection rules for harmful elements contained in heavy non-ferrous metal concentrate products. This Document applies to heavy non-ferrous metal concentrate products.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in this Document. For the dated documents, only the versions with the dates indicated are applicable to this Document; for the undated documents, only the latest version (including all the amendments) is applicable to this Document.

GB/T 1819.4 Methods for chemical analysis of tin concentrates - Determination of lead content - Flame atomic absorption spectrometric method and EDTA titrimetric method

GB/T 1819.5 Methods for chemical analysis of tin concentrates - Determination of arsenic content - The molybdoantimonyarsenate blue spectrophotometric method and the distillation-iodometric titration

GB/T 1819.17 Methods for chemical analysis of tin concentrates - Part

3 Terms and Definitions

For the purposes of this Document, the following terms and definitions apply.

3.1 Heavy nonferrous metal concentrates products A general term for heavy metal concentrates in nonferrous metals. NOTE. It generally includes copper concentrate, lead concentrate, zinc concentrate, lead and zinc bulk concentrate, tin concentrate, nickel concentrate, cobalt concentrate, antimony concentrate, etc.

3.3 Copper concentrate A concentrate product for copper smelting with a copper content of no less than 13% obtained by flotation or other methods of beneficiation of copper-containing ore.

3.4 Lead concentrate A concentrate product for lead smelting with a lead content of no less than 40% obtained by flotation or other methods of beneficiation of lead-containing ore.

3.6 Lead and zinc bulk concentrate A concentrate product for smelting lead and zinc simultaneously with a lead content of no less than 14%, a zinc content of no less than 28%,

3.7 Tin concentrate A concentrate product for smelting tin with a tin content of no less than 40%, thereof the tin content is no more than 30% for the particle size of no more than 3mm and less than 0.074mm, obtained by flotation or other methods of beneficiation of tin-containing ore.

3.8 Nickel concentrate A concentrate product for smelting nickel with a nickel content of no less than 5.0%, thereof the nickel content is no less than 80% for the particle size of less than 0.074mm, obtained by flotation or other methods of beneficiation of nickel-containing ore.

4 Limit Requirements

4.1 Copper concentrate The harmful elements contained in copper concentrate shall comply with the provisions of Table 1.

4.2 Lead concentrate The harmful elements contained in lead concentrate shall comply with the provisions of Table 2.

4.3 Zinc concentrate The harmful elements contained in zinc concentrate shall comply with the provisions of Table 3.

4.4 Lead and zinc bulk concentrate The harmful elements contained in lead and zinc bulk concentrate shall comply with the provisions of Table 4. Table 4 -- Limits of harmful elements in lead and zinc bulk concentrate

4.7 Cobalt concentrate The harmful elements contained in cobalt concentrate shall comply with the provisions of Table 7.

4.8 Antimony concentrate The harmful elements contained in antimony concentrate shall comply with the provisions of Table 8.

5 Test Methods

5.1 Copper concentrate The arbitration analysis methods for the chemical compositions of Pb, As, F, Cd and Hg elements in copper concentrate shall be carried out in accordance with the provisions of GB/T 3884.7, GB/T 3884.9, GB/T 3884.5, GB/T 3884.6 and GB/T3884.11 respectively.

5.2 Lead concentrate The arbitration analysis methods for the chemical compositions of As, Hg, Cd and Tl elements in lead concentrate shall be carried out in accordance with the provisions of GB/T 8152.5, GB/T 8152.11, GB/T 8152.12 and GB/T 8152.13 respectively.

5.4 Lead and zinc bulk concentrate The arbitration analysis methods for the chemical compositions of As, Cd, Hg and Tl elements in lead and zinc bulk concentrate shall be carried out in accordance with the provisions of YS/T 461.4, YS/T 461.7, YS/T 461.6 and YS/T 461.12 respectively.

5.5 Tin concentrate The arbitral analysis methods for the chemical compositions of Pb, As and Hg in tin concentrate shall be carried out in accordance with the provisions of GB/T 1819.4, GB/T 1819.5 and GB/T 1819.17 respectively.

5.7 Cobalt concentrate The arbitration analysis methods for the chemical compositions of Pb, As, Cd, Hg and Cr elements in cobalt concentrate shall be carried out in accordance with the provisions of YS/T 472.4, YS/T 472.5, YS/T 472.1, YS/T 472.3 and YS/T 472.2 respectively.

17 Determination of mercury content - Atomic fluorescence spectrometric method

GB/T 3884.5 Methods for chemical analysis of copper concentrates - Part