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

GB/T 3648-2024

Replacing GB/T 3648-2013

Ferrotungsten

钨铁

(English Translation)

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Table of Contents

- Foreword
- 1 Scope
- 2 Normative references
- 3 Terms and definitions
- 4 Technical requirements

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting:

This document replaces GB/T 3648-2013 "Tungsten Ferro" and has the following main changes compared to GB/T 3648-2013, except for structural adjustments and editorial changes:

The main technical changes are as follows:

- a) Added terms and definitions (see Chapter 3);
- b) The description of the classification of ferrotungsten grades has been changed (see 4.1:1, 3:1:1 of the:2013 edition);
- c) Added technical requirements for Ni, Co and Al elements in the chemical composition of ferrotungsten (see Table 1);
- d) Changed the range of W content in FeW70 (see Table 1, Table 1 of the:2013 edition);
- e) Added analysis methods for Ni, Co and Al (see Table 2):

This document is modified to adopt ISO 5450:1980 "Specifications and delivery conditions for ferrotungsten":

Compared with ISO 5450:1980, this document has many structural adjustments: See the attached table for the structural number comparison between the two documents:

Record A:

This document has more technical differences than ISO 5450:1980:

A list of these technical differences and their causes is given in Appendix B:

1 Scope

This document specifies the technical requirements, test methods, inspection rules, packaging, storage, transportation, marking and quality certificate of ferrotungsten:

This document applies to ferrotungsten used as a tungsten element additive in steelmaking and alloy materials:

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document:

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document:

GB/T 3650 General provisions for acceptance, packaging, storage, transportation, marking and quality certification of ferroalloys GB/T 4010 Sampling and preparation of samples for chemical analysis of ferroalloys GB/T 7731.1 Determination of tungsten content by cinchonine gravimetric method and ammonium nitrate gravimetric method GB/T 7731.2 Determination of tungsten, iron and manganese content - Periodate spectrophotometry and flame atomic absorption spectrometry GB/T 7731.3 Determination of tungsten, iron and copper content - Biscyclohexanone oxalyl dihydrazone spectrophotometry and flame atomic absorption spectrometry GB/T 7731.4 Determination of phosphorus content of tungsten iron-phosphomolybdenum blue spectrophotometric method GB/T 7731.5 Determination of tungsten-iron-silicon content - Silicon-molybdenum blue spectrophotometric method GB/T 7731.6 Determination of tungsten, iron and arsenic content - Molybdenum blue photometry and inductively coupled plasma atomic emission spectrometry GB/T 7731.7 Determination of tungsten, iron and tin content - Phenylfluorone photometric method and inductively coupled plasma atomic emission spectrometric method GB/T 7731.8 Determination of tungsten, iron and antimony content - Rhodamine B photometric method and inductively coupled plasma atomic emission spectrometry GB/T 7731.9 Determination of bismuth content of tungsten iron - Bismuth iodide photometric method and inductively coupled plasma atomic emission spectrometry GB/T 7731.10 Determination of carbon content of tungsten iron - Infrared absorption method GB/T 7731.12 Determination of sulfur content in tungsten iron - Infrared absorption method and combustion neutralization titration method GB/T 7731.14 Determination of tungsten, iron and lead content - Polarographic method and inductively coupled plasma atomic emission spectrometry GB/T 7731.17 Determination of tungsten, iron, cobalt, nickel and aluminum content - Inductively coupled plasma atomic emission spectrometry GB/T 13247 Sampling and testing methods for particle size of ferroalloy products

3 Terms and definitions

The following terms and definitions apply to this document:

An alloy of iron and tungsten with a tungsten content (mass fraction) in the range of 65.0% to 85.0%:

4 Technical requirements

4.1

Brand and chemical composition

4.1.1

According to the different contents of tungsten and impurities, ferrotungsten is divided into four grades: FeW80-A, FeW80-B, FeW80-C and FeW70: The chemical composition should be