

ICS 77.100
CCS H 42



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

GB/T 43110-2023

Chromium powder for additive manufacturing

增材制造用金属铬粉

Issued on: September 7, 2023

Implemented on: April 1, 2024

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

Table of Contents

- 1 Scope
- 2 Normative reference documents
- 3 Terms and definitions
- 4 Technical requirements

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents. This document is proposed by the China Iron and Steel Industry Association. This document is under the jurisdiction of the National Pig Iron and Ferroalloy Standardization Technical Committee (SAC/TC318). This document was drafted by: Institute of New Materials, Guangdong Academy of Sciences, Iron and Steel Research Institute Co., Ltd., Metallurgical Industry Information Standards Institute, Harbin Nengchuang Digital Technology Co., Ltd., Jiangsu Velari New Material Technology Co., Ltd., China Machinery Research Institute of Standards and Technology (Beijing) Co., Ltd. company. The main drafters of this document. Tan Chong, Liang Jianxiong, Liu Xin, Wang Lin, Che Pengcheng, Shi Qi, Wang Changjun, Xu Rongyu, Xue Lian, Yan Xingchen, Liu Yu, Yan Chengming, He Huaizhi, Tang Yueyue, Li Haibin. Metal chromium powder for additive manufacturing

1 Scope

China's national standard for chromium powder used in additive manufacturing. Chromium is the element that makes steel stainless and superalloys oxidation resistant, and as a powder for printing it appears both as an alloying addition in blended feedstocks and, in high purity form, for the chromium-rich coatings and components used where oxidation and wear resistance dominate. Its difficulty as a powder is that it is brittle and it oxidises readily, so producing spherical particles free of oxide requires plasma processing rather than the mechanical routes that suffice for ductile metals. Oxygen content is the property the standard has to control most tightly: oxide on a particle surface does not melt at the temperature the metal does, so it survives into the built part as an inclusion and as a barrier to fusion between layers, which is where a printed component fails.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document.

GB/T 1479.1 Determination of bulk density of metal powders Part

GB/T 1480 Metal powder dry screening method for particle size determination

GB/T 1482 Standard funnel method for determination of flowability of metal powders (Hall flow meter)

GB/T 4702.3 Determination of metallic chromium and phosphorus content bismuth phosphorus molybdenum blue spectrophotometry

GB/T 4702.14 Chemical analysis method for metallic chromium - Determination of carbon content by infrared absorption method

GB/T 4702.16 Determination of metallic chromium and sulfur content by infrared absorption method and combustion neutralization titration method

GB/T 5162 Determination of tap density of metal powders

GB/T 5314 Powders for powder metallurgy - Sampling methods

GB/T 19077 Laser diffraction method for particle size analysis

GB/T 28908-2012 High purity metal chromium

GB/T 35351 Additive Manufacturing Terminology

3 Terms and definitions

The terms and definitions defined in GB/T 35351 apply to this document.

4 Technical requirements

4.1 Chemical composition The chemical composition of chromium powder should comply with the requirements in Table 1.