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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 47091-2026

Metallic powder - Determination of conductivity

金属粉末 电导率的测定

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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 involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China Nonferrous Metals Industry Association. This document is under the jurisdiction of the National Technical Committee on Standardization of Nonferrous Metals (SAC/TC243). This document was drafted by: Chongqing Advanced Metallurgical New Materials Co., Ltd., Shenzhen Xiate Technology Co., Ltd., and Yuaneng Technology (Xiamen) Co., Ltd. The company, Northwest Nonferrous Metals Research Institute, Xi'an Ouzhong Materials Technology Co., Ltd., GEM (Wuxi) Energy Materials Co., Ltd., Xi'an Sai Longxin Additive Manufacturing Technology Co., Ltd., Guohe General (Chongqing) Testing, Evaluation and Certification Co., Ltd., Sichuan Steel Research Gaona Forging Co., Ltd. Asia New Materials (Beijing) Co., Ltd. The main drafters of this document are. Zhang Jingguo, Li Zhanrong, Wan Junxi, Zhang Yubo, Tang Jianying, Yang Xiaolu, Li Hangyu, Xin Lin, Shi Yang, and Qu Xiang. Qin Yazhou, Yang Xingbo, Qu Jinglong, Luo Zhiqiang, Gong Hongfang, Wang Yandong, Lin Yongjin. Determination of electrical conductivity of metal powder

1 Scope

GB/T 47091-2026 is the Chinese national standard covering the electrical conductivity of a metal powder - a compacted-bed measurement that reveals the surface oxide on the particles, which is what actually limits sintering and, in additive manufacturing, what determines whether the layers fuse. First edition. It was issued on 28 January 2026 and has been in force since 1 August 2026, as a first edition. The document is under the responsibility of the China Nonferrous Metals Industry Association. This page is published from the official record of the 2026 edition; the clause text of a standard this recent is not yet in circulation, and the figures, limits and tables it contains are those of the document itself, delivered in full with the English translation.

This document describes a method for determining the conductivity of metal powders using the four-probe method. This document applies to the resistivity and conductivity of powders of metals such as copper, silver, nickel, aluminum, zinc, and gold, as well as their alloys and other conductive metal powders. Measurement.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included. For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies. This document.

GB/T 2900.4 Electrical Engineering Terminology - Electrical Alloys

GB/T 8170 Rules for rounding off numerical values and the representation and determination of limiting values

3 Terms and Definitions

The terms and definitions defined in GB/T 2900.4 and the following terms and definitions apply to this document.

3.1 conductivity The ability of a material to conduct electric current.

Note. Commonly used units are Siemens per meter (S/m) or micro Siemens per meter (μS/m).

3.2 Four-probe method The powder material was pre-compressed, and the compaction density of the sample was measured using a four-probe resistivity meter under continuous or constant pressure. A method for measuring the resistivity of a sample under different or the same compaction density, whether the density is constantly changing or remains constant.

4.Principles The sample material is filled into an insulating mold, and pressure is applied to the upper surface of the sample, with the upper surface of the sample tightly pressed against four probes arranged in a straight line. The four probes are in close contact and pressed vertically against the upper surface of the sample. Current flows between the outer probe 1 and probe 4, while a current is formed between the inner probe 2 and probe 3. Voltage circuit. The resistivity values under different pressures are calculated using formula (1), and then the conductivity of the metal powder is calculated using formula (2). IV. The principle of the probe method is shown in Figure 1. rho=2pil U1 I1 (1) In the formula. rho

--- The resistivity of the sample, in ohm-meters (Omega·m); pi

--- Pi, taken as 3.14;