

ICS 77.120.99

CCS H 65



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

GB/T 42668-2023

**Samarium-iron-nitrogen permanent magnetic powder for
bonded magnets**

钐铁氮粘结永磁粉

Issued on: August 6, 2023

Implemented on: March 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 Classification and brand

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 under the jurisdiction of the National Rare Earth Standardization Technical Committee (SAC/TC229). This document was drafted by: Youyan Rare Earth New Materials Co., Ltd., Ningbo Yunsheng Bonded Magnet Co., Ltd., Hangzhou Qianshi Technology Co., Ltd. Company, Anhui Dadixiong New Materials Co., Ltd., Beijing Zhongke Sanhuan High-Tech Co., Ltd., Beijing University of Technology, Youyan Rare Earth (Rongcheng) Co., Ltd., Baotou Rare Earth Research Institute, Youyan Rare Earth High Technology Co., Ltd., Qiandong Rare Earth Group Co., Ltd., Baotou Rare Earth New Materials Technology R&D Center, Jiangxi Zhongshi New Materials Co., Ltd., Baotou Tianhe Magnetic Materials Technology Co., Ltd., Beikang Magnetic Materials Technology Co., Ltd. Ltd. The main drafters of this document. Luo Yang, Yan Wenlong, Wang Zilong, Peng Haijun, Lin Xiao, Yu Dunbo, Quan Ningtao, Zhang Weishan, Chen Haibo, Yang Yuanfei, Yi Xiaofei, Cao Shuohao, Yue Ming, Yao Nanhong, Ma Yuehua, Fu Jianlong, Shan Weikang, Wu Shujie, Zhu Xiaoting, Bai Xinyuan, Li Tianhao, Wang Zhongkai, Zhu Shengjie, Cai Wei, Jin Zhenjun, Shen Guodi, Diao Shulin, Zhao Ningning, Xu Huibing, Duan Jiping, Jin Guoshun, Che Shenglei, Mou Di, Liu Rongming, Wang Ke. Samarium iron nitrogen bonded permanent magnet powder

1 Scope

China's national standard for samarium-iron-nitrogen permanent magnetic powder used in bonded magnets. The material occupies a specific niche between the two dominant magnet families. Neodymium iron boron is stronger but loses coercivity as it warms, so it needs heavy rare earth additions for hot applications; samarium cobalt tolerates heat but is weaker and expensive. Samarium-iron-nitrogen has a magnetic anisotropy and a Curie temperature close to samarium cobalt's with a remanence approaching neodymium's, and it

contains no cobalt. What it cannot do is be sintered - the nitrogen is driven off and the phase decomposes above about 500 degrees C - so it can only be used as a powder bound in a polymer. That confines it to bonded magnets, where the trade-off is a lower density and therefore a weaker magnet, but where complex shapes can be moulded directly and the corrosion resistance is far better.

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 9637 Electrical Terminology Magnetic Materials and Components

GB/T 15676 Rare earth terminology

GB/T 19077 Particle size distribution laser diffraction method

GB/T 20168-2017 Rapidly quenched NdFeB permanent magnet powder

GB/T 24270 Measurement method of temperature coefficient of magnetic properties of permanent magnet materials

GB 39176 Packaging, marking, transportation and storage of rare earth products

GB/T 40794 Detection method for irreversible loss of high temperature magnetic flux of rare earth permanent magnet materials

GB/T 41967-2022 Anisotropic NdFeB permanent magnet powder

3 Terms and definitions

The following terms and definitions as defined in GB/T 9637 and GB/T 15676 apply to this document.

3.1 SmFeN permanent magnetic powder with the same magnetic properties after magnetization in any direction.

3.2 After magnetization in a certain direction, its magnetic performance is much higher than that of samarium iron nitrogen permanent magnet powder after magnetization in other directions.

4 Classification and brand

4.1 Classification Permanent magnetic powder can be divided into two categories. isotropic and anisotropic.

4.2 Brand Each type of product is divided into several grades according to the maximum magnetic energy product and coercive force. The specific grades are shown in Table 1.

chinastandards.org - PREVIEW