

ICS 29.030
CCS K14



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

GB/T 44654-2024

Amorphous soft magnetic alloy wire

非晶软磁合金丝材

Issued on: September 29, 2024

Implemented on: April 1, 2025

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

Table of Contents

1 Scope ...	1
2 Normative references ...	1
3 Terms and Definitions ...	1
4 Brand naming method ...	1
5 Technical requirements ...	2
5.1 Appearance ...	2
5.2 Nominal diameter and allowable deviation ...	2
5.3 Magnetic properties ...	2
6 Test methods ...	2
6.1 Surface quality ...	2
6.2 Nominal diameter and allowable deviation ...	2
6.3 Magnetic properties ...	3
7 Inspection Rules ...	3
7.1 Inspection Items ...	3
7.2 Batch Grouping Rules ...	3
7.3 Sampling plan ...	3
7.4 Decision Rules ...	3
8 Packaging, marking, transportation and storage ...	3
8.1 Packaging ...	3
8.2 Logo ...	4
8.3 Transport ...	4
5 Table C.1 Switch closure sequence to keep the sample in a stable cycle state ...	10

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 is required. Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents. This document was proposed by the China Electrical Equipment Industry Association. This document is under the jurisdiction of the National Technical Committee for Standardization of Electrical Alloys (SAC/TC 228). This document was drafted by: Ningbo Magnetic

Materials Application Technology Innovation Center Co., Ltd., Jiangsu Yangdian Technology Co., Ltd., Harbin University of Science and Technology, Aerospace Information Innovation Institute of Chinese Academy of Sciences, State Grid Hebei Electric Power Co., Ltd. Cangzhou Power Supply Branch, Jiangxi Aite Magnetic Materials Co., Ltd., Guilin Electric Science Research Institute Co., Ltd., State Grid Smart Grid Research Institute Co., Ltd., Hunan Lianzhong Magnetic Instrument Co., Ltd. Company, Baotou Rare Earth Research Institute, Zhejiang Zhaojing Electric Technology Co., Ltd., Jiangxi Dayou Technology Co., Ltd., China University of Metrology, and Heye Health Technology Co., Ltd., Inner Mongolia University of Technology, Zhejiang Daishengsi Medical Technology Co., Ltd., Ningbo Institute of Materials Technology and Engineering, Chinese Academy of Sciences Institute, Qingdao University of Technology, Shandong Beike New Energy Technology Co., Ltd., Tianjin Sanhuan Aona Technology Co., Ltd., Hangzhou Quadrant Technology Co., Ltd. Ltd., Hebei University of Technology, China Southern Power Grid Co., Ltd. Ultra-high Voltage Transmission Company, Guilin University of Electronic Technology, Shenzhen Zhongbao New Energy Technology Co., Ltd. Materials Technology Co., Ltd., Anhui Zhici New Materials Technology Co., Ltd., Beijing Mingxin Hengye Technology Co., Ltd., Jiangsu Bimudi New Materials Technology Co., Ltd., Chongqing Wangbian Electric (Group) Co., Ltd. The main drafters of this document are. Man Qikui, Chen Bo, Jiang Sida, Zhuang Xin, Song Wenle, Mao Shenghua, Cui Defeng, Han Yu, Hu Te, Yue Junyu, Dong Weiwei, Mao Wenlong, Yang Hangfu, Fang Yanwen, Liu Jingshun, Situ Duo, Li Jiawei, Zhang Shuling, Hua Xun, An Hailu, Zhao Yi, Wang Jingqin, Yang Shunjian, Tang Chengying, Li Shengwei, Luo Dingfei, Li Yuzhan, Zhang Mohan, Fan Gangqiang, Zhu Fangliang, He Aina, Zhang Hua, Ding Yi, Yang Fuyao, Liu Yang, Lu Ming, Huang Yuhua, Zhao Haorong, Hu Shoutian. Amorphous soft magnetic alloy wire

1 Scope

GB/T 44654-2024 covers amorphous soft magnetic alloy wire, the rapidly quenched iron- or cobalt-based wire whose atoms never settle into a crystal lattice. The absence of grain boundaries is what makes it useful: there is nothing to pin a domain wall, so the coercivity is very low, the permeability very high and the losses small, and in wire form the material also shows the large Barkhausen jump and the magneto-impedance effect that anti-theft tags and magnetic sensors are built on. The properties are destroyed by any heating that lets the wire crystallise, so the specification is as much about what the manufacturer must not do as about what the wire must achieve. The standard sets the grade naming method and then the technical requirements - appearance, nominal diameter and permitted deviation, and magnetic properties - with the corresponding test methods for surface quality, diameter and magnetic properties, and the inspection rules covering inspection items, batch grouping and the sampling plan, followed by the packaging, marking, transport and storage provisions. It takes effect on 1 April 2025.

This document defines the terms and definitions of amorphous soft magnetic alloy wires,

specifies the grades and naming methods, technical specifications, and Requirements, inspection rules, packaging, marking, transportation and storage, and test methods for amorphous soft magnetic alloy wire are described. This document applies to amorphous soft magnetic components with a diameter of

0.02 mm to

0.16 mm used in power electronics, electronic information and medical fields. Alloy wire (hereinafter referred to as "amorphous wire").

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. in this document.

GB/T 2828.1-2012 Sampling procedures for inspection by attributes Part

3 Terms and definitions

The terms and definitions defined in GB/T 2900.1, GB/T 9637 and GB/T 15019 and the following apply to this document.

3.1 Amorphous wire with soft magnetic properties is prepared by rapid solidification of high-temperature liquid alloy.

4.Brand naming method The naming method of amorphous wire grades is shown in Figure

1.The classification of rapidly quenched metals is named according to the provisions of GB/T 15019. Figure

1 Naming method of amorphous wire grades Example. A1K206bS means rapid-quenching soft magnetic cobalt-based amorphous wire with nominal diameter grade b.