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**Sintered neodymium iron boron permanent magnets-Steady
state damp heat tests**

烧结钕铁硼永磁体 恒定湿热试验

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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:

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This document was drafted by: Ningbo Koningda Industrial Co., Ltd., Beijing Zhongke Sanhuan High-Tech Co., Ltd., Ningbo Zhaobao Magnetic Industry Co., Ltd:

Co., Ltd., Hangzhou Meici Technology Co., Ltd., Ningbo Permanent Magnet Industry Co., Ltd., Tianjin Sanhuan Lexi New Materials Co., Ltd., Chinese Academy of Sciences Ningbo Wave Materials Technology and Engineering Research Institute, Anhui Dadixiong New Materials Co., Ltd., Fujian Changting Jinlong Rare Earth Co., Ltd., Ningbo Yunsheng Co., Ltd., Hangzhou Kede Magnetic Industry Co., Ltd., Guohe General Testing and Evaluation Certification Co., Ltd., Youyan Rare Earth (Rongcheng) Co., Ltd., Gan Zhoufuerte

Electronics Co., Ltd., Baotou Tianhe Magnetic Materials Technology Co., Ltd., Beijing University of Technology, Ningbo Songke Magnetic Materials Co., Ltd., Hangzhou Quadrant Technology Co., Ltd., Nonferrous Metals Technology and Economic Research Institute Co., Ltd:

The main drafters of this document: Jin Guoshun, Cao Shuohao, Jiang Bing, Chen Zhian, Ding Lijun, Yao Lihong, Xue Huili, Zuo Jimin, Song Guanyu, Shen Lihan, Han Peisong, Jia Shengli, Li Jianzhong, Liu Wuli, Jiang Jianjun, Song Zhenlun, Feng Quanyu, Zhang Jiulei, Wang Jinfeng, Li Lingling, Zhao Xiuhong, Yan Wenlong, Zhang Baoguo, Qi Zhiqi, Wu Zhimin, Liu Weiqiang, Wu Congxiang, Zhao Yi, Lin Xiao:

Introduction

The constant damp heat test of sintered NdFeB permanent magnets includes ordinary constant damp heat test and unsaturated high-pressure steam constant damp heat test (hereinafter referred to as (called "HAST test") and saturated high-pressure steam constant heat and humidity test (hereinafter referred to as "PCT test"): In ordinary constant humidity and heat tests and In the HAST test, there is usually no condensation on the sample surface (see Appendix A): It is mainly due to physical phenomena such as water vapor adsorption, diffusion and absorption that the sample Changes occur; the PCT test emphasizes the presence of condensation on the sample, which is two completely different tests from the HAST test (see Appendix B):

Special emphasis is placed on the failure mechanism of sintered NdFeB permanent magnets under severe test conditions and normal use conditions when conducting wet-heat accelerated tests:

The failure mechanisms under normal conditions are not exactly the same: The factors causing the failure of sintered NdFeB permanent magnets under normal use conditions are more complex and severe stress The rapid environmental test results are for reference by users of sintered NdFeB permanent magnets:

Constant damp heat test of sintered NdFeB permanent magnets

1 Scope

This document describes a method for constant damp heat testing of sintered NdFeB permanent magnets:

Note: According to the steam pressure in the test chamber during the test, the constant damp heat test of sintered NdFeB permanent magnets is divided into ordinary constant damp heat test and high pressure steam constant heat test:

Damp heat test, among which, the high-pressure steam constant damp heat test is divided into HAST test and PCT test:

This document is applicable to the constant moist heat test of sintered NdFeB permanent magnets with covering layers, including metal protective layers, coatings, conversion Film layer and composite protective layer; also suitable for constant damp heat test before measuring the irreversible loss of magnetic flux in the open circuit state of sintered NdFeB permanent magnets:

2 Normative reference documents

GB/T 8170

GB/T 13560

GB/T 34491

GB/T 38437

GB/T 40793

3 Terms and definitions

The following terms and definitions apply to this document: 3:1 Constant humidity and heat test of unsaturated steam in a humidity and heat chamber:

Note: The normal control range of temperature and humidity is: 30°C~95°C, 50%RH~95%RH (RH means relative humidity): 3:2 Constant hygrothermal test of unsaturated high-pressure steam in a pressure vessel:

Note: The normal control range of temperature and humidity is: 105°C~135°C, 75%RH~98%RH: 3:3 PCT test pressure cookertest Constant hygrothermal test of saturated high-pressure steam in a pressure vessel:

Note: The normal control range of temperature and humidity is: 105°C~135°C, 100%RH: 3:4 conversion film conversion film A compound film formed by chemical or electrochemical treatment on the surface of sintered NdFeB permanent magnets:

Note: Conversion coatings include phosphating coatings, zirconating coatings and various types of oxide coatings (such as passivation coatings):