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

GB/T 43102-2023

**Metallic coatings - Porosity tests - Porosity in gold or palladium
coatings by sulfurous acid/sulfur dioxide vapour**

金属覆盖层 孔隙率试验 用亚硫酸/二氧化硫蒸汽测定金或钯镀层孔隙率

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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. This document is modified to adopt ISO 15721.2001 "Metal coating porosity test using sulfurous acid/sulfur dioxide vapor to determine gold or Porosity of palladium coatings". The technical differences between this document and ISO 15721.2001 and their reasons are as follows:

---Replaced ISO 2064 with normatively cited GB/T 12334, and replaced ISO 2079 with ISO 2080 (see Chapter 3) to suit Respond to my country's technical conditions and increase operability;

---Added sulfurous acid safety requirements (see Chapter 5) to comply with domestic technical conditions;

---Changed the scope to comply with domestic technical conditions;

---Adjusted the safety requirements for test procedures (see 6.1, 6.3) to comply with my country's technical conditions;

---Adjust Note 1, Note 2 of

8.1 to the corresponding chapter paragraphs. The following editorial changes have been made to this document.

---Added Appendix A to mention the description;

---Change the title of

7.2 to test environmental conditions;

7.3 guide. 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 China Machinery Industry Federation. This document is under the jurisdiction of the National Standardization Technical Committee for Metallic and Non-metallic Coverings (SAC/TC57). This document was drafted by: Wuhan Materials Protection Research Institute Co., Ltd., State Grid Hubei Electric Power Co., Ltd. Electric Power Research Institute, Anhui Zhongteng Chemical Technology Co., Ltd., Hubei Tieshen New Materials Co., Ltd., Tongxiang Tiesheng Line Equipment Co., Ltd., Weidali Industrial (Shenzhen) Shenzhen Co., Ltd., Dongguan Yi'an Technology Co., Ltd. The main drafters of this document. Xiao Xiangding, Wu Jun, Zhang Ming, Wu Xiaochen, Cao Mengling, Li Changchun, Shi Mingde, Yi Juan, Shen Yu, Huang Feng, Pang Dong.

This test method uses concentrated sulfurous acid (H_2SO_3) to release sulfur dioxide (SO_2) gas according to the equilibrium reaction. $\text{H}_2\text{SO}_3 = \text{SO}_2 + \text{H}_2\text{O}$, determine the porosity of gold or palladium coatings. This method can adjust the exposure time of the specimen according to the porosity of the exposed specimen. The gas reacts with the easily corroded base metal and forms in the pores. The reaction products generated here are discretely distributed on the surface of the gold or palladium coating. Lenses or low-magnification stereomicroscopes can be used to examine individual corrosion spots. row count. This test method is applicable to coatings containing 95% or more gold or palladium on copper, nickel and their alloy substrates commonly used in electrical contacts. This test is destructive because it reveals the presence of pores by contaminating the surface with corrosion products, and it is present at the location of the pores or in the unplated. The protective cover is weakened at the boundaries of areas. This test method is capable of detecting virtually any porosity or other defect that is subject to a corrosion reaction with the base or underlying coating metal. This test is fast, easy and cheap. In addition, it can be used on contacts with complex geometries, such as pin headers (it can be used to open contacts with deep grooves). point structure to allow sulfur dioxide to react with internal available surfaces). See Appendix A for the significance and use of the determination of metal coating (gold or palladium). Sulfurous acid/sulfite for metal coating porosity test Sulfur dioxide vapor determination of porosity of gold or palladium coatings WARNING

---This document is not intended to address all safety issues, if any, related to its use. Users of this document are responsible for using. Establish appropriate safety and health

measures and determine regulatory systems before using this document. See Chapter 6 for specific terms.

1 Scope

GB/T 43102-2023 gives the sulfurous acid and sulfur dioxide vapour test for porosity in gold or palladium coatings, adopting ISO 15721 with modifications. Gold plating on a connector is a fraction of a micrometre thick and is there to keep the contact resistance stable for the life of the equipment; what defeats it is not wear but porosity, since at every pore the base metal is exposed and corrodes, and the product creeps over the gold. The test finds those pores by exposing the part to a vapour that attacks the base metal and not the gold, and counting the corrosion spots. The standard sets the test apparatus, the reagents, the safety hazards, the procedure including cleaning, environmental conditions and the operating sequence, the examination, the precision and the test report. It took effect on 1 April 2024.

This document specifies equipment and methods for the determination of porosity of gold or palladium coatings using sulfurous acid/sulfur dioxide vapor, particularly for the determination of electrical Apparatus and method for porosity of plating and gold coatings on contacts. This document is not applicable to the compliance determination of specific values of porosity. This document is not intended to predict the electrical performance of plated contacts from the location of pores and corrosion products. This document is suitable for the quantitative description of gold or palladium coatings with porosity less than 100/cm². This document is suitable for the qualitative description and comparison of gold or palladium coatings with porosity greater than or equal to 100/cm².

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 12334 Definition and general rules for thickness measurement of metal and other non-organic coatings (GB/T 12334- 2001, ISO 2064.1996, IDT)

GB/T 3138-2015 Terminology for surface treatment of metals and other inorganic coatings (ISO 2080.2008, IDT)

GB/T 17720-1999 Review of porosity test of metal coatings (eqv ISO 10308.1995)

3 Terms and definitions

The following terms and definitions as defined in GB/T 12334, ISO 2080 and ISO 10308

apply to this document.

3.1 corrosion product ~~corrosion product~~ Reactants precipitated from the pores that protrude from or adhere to the surface of the covering after exposure to the vapor test.

3.2 metal cladding ~~metallic coating~~ An electrodeposition layer, cladding layer or other metal layer covering the substrate.

Note. The covering layer can be a single metal layer or a combination of multiple metal layers.

3.3 porosity Any discontinuity, crack, or hole in the covering that exposes various underlying metals.