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

GB/T 45714.54-2025

**Printed circuit board materials - Part 5-4: Sectional specification
set for conductive foils and films with or without coatings -
Conductive pastes
(English Translation)**

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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.

This document is part 5-4 of GB/T 45714 "Printed Circuit Board Materials". GB/T 45714 has been published in the following parts.

--- Part 5-4. Conductive foils and films, coated or uncoated. Sectional specification for conductive pastes.

This document modifies IEC 61249-5-4:1996 "Interconnection structural materials - Part 5: Specifications for coated or uncoated conductive foils and films" Section 4: Conductive Inks.

This document has made the following structural adjustments compared to IEC 61249-5-4:1996.

--- Chapter 4 and Chapter 5 correspond to Chapter 3 of IEC 61249-5-4:1996, adding 4.1, 4.1.3, 4.2.2.4, 4.2.3.4, 4.2.4, 4.2.6;

---Added Chapter 6 and Chapter 7.

The technical differences between this document and IEC 61249-5-4:1996 and their reasons are as follows.

--- Changed the scope (see Chapter 1) to adapt to the new requirements and technological developments in the current PCB manufacturing process;

--- Deleted the three normative references of IEC 61249-5-4:1996 because they were not cited in the text;

--- Added normative references to GB 190-2009 (see 7.1), GB/T 1725-2007 (see 5.2.4), GB/T 2036 (see

3), GB/T 2423.16-2022 (see 5.2.22), GB/T 4677-2002 (see 5.2.7, 5.2.10.1, 5.2.15, 5.2.17, 6.4.2), GB/T 5547-2007 (see 5.2.2), GB/T 6739-2022 (see 5.2.9), GB/T 1724-2019 (see 5.2.3), GB/T 13557-2017 (see 5.2.10.2), GB/T 21862.5-2008 (see 5.2.5), GB/T 22472-2008 (see 5.2.21), GB/T 26125-2011 (see 4.1.3, 5.2.6), SJ11171-2016 (see 5.2.14), to adapt to my country's Technical conditions, close to current process needs and quality assurance requirements, increase operability;

--- Added the terms "conductive paste", "square resistance" and "through-hole resistance" and their definitions (see Chapter 3), clarified key terms, and ensured standard descriptions be clear and accurate;

--- Added requirements and test methods before curing, including appearance, physical properties, and restricted substance content (see Chapters 4 and 5).

Ensure that the initial state of the material during the curing process meets the requirements;

--- Added requirements and test methods after curing, including appearance, moisture resistance, through-hole resistance, temperature shock test and mildew resistance (see Chapter 4 and Chapter 5), to meet the needs of the current market;

--- Added "test conditions" in "test methods" (see 5.1), supplemented and improved the inspection test methods for the items added in this document, and clarified Determine the conditions and procedures for various tests;

--- Added the content of "Quality Assurance" (see Chapter 6), standardized the quality

assurance process, and ensured that the products meet the standards;

--- Added the requirements for "packaging, transportation and storage" (see Chapter 7) and improved the material storage requirements;

--- Add Appendix "A" comprehensive test diagram, 6 area diagrams in the diagram are IEC standard Appendix A (normative) diagrams, and the remaining 6 areas are the domain is an additional test graph (see Appendix A), which visually displays the performance indicators of the material to facilitate understanding and verification.

The following editorial changes were made to this document.

--- In order to coordinate with the existing standards, the name of the standard is changed to "Printed circuit board materials Part 5-4.Coated or uncoated conductive foil Conductive paste and membrane specifications";

--- Deleted IEC 61249-5-4:1996 Appendix B (informative) and Appendix C (informative), the test methods and GB/T 4677-2002 has some similar clauses. In order to be closer to the current process requirements and quality control requirements, the original appendix the content is no longer used as a reference.

Introduction

Conductive paste products for coated or uncoated conductive foils and films are widely used in printed circuit boards for automotive, medical devices, consumer this product is designed to analyze the various properties, test methods, quality assurance system and other aspects of the conductive paste in printed circuit board materials.

GB/T 45714 "Printed Circuit Board Materials" is planned to consist of one part.

--- Part 5-4.Sectional specification for coated or uncoated conductive foils and films Conductive pastes. The purpose is to specify coated or uncoated conductive foils and films.

Technical requirements, test methods, storage conditions, etc. of conductive pastes for conductive foils and films.

This document clarifies the performance indicators of conductive paste, formulates scientific and reasonable test procedures, and stipulates appropriate storage conditions.

Standardize the application of conductive paste in printed circuit board materials to ensure high consistency and reliability of product quality to meet different applications.

The release and implementation of this document will provide a solid and reliable basis for quality control for the entire industry chain and effectively promote the industry the industry will continue to develop in a healthy, orderly and high-quality direction. At the same time, this document will also lay a foundation for technological innovation and product upgrades in related fields.

The foundation promotes the continuous improvement of industrial technology level.

Printed circuit board materials Part 5-4.Coating or Specification for conductive pastes for uncoated conductive foils and films

1 Scope

This document specifies the performance requirements, test methods, quality assurance, packaging, transportation and storage of conductive pastes.

This document applies to conductive pastes for conductors, through-holes, membrane switches and connection ports of printed circuits.

2 Normative references

The contents of the following documents constitute 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 to this document.

GB 190-2009 Dangerous Goods Packaging Marking GB/T 1724-2019 Paints, varnishes and printing inks - Determination of fineness of grind (ISO 1524:2013, MOD) GB/T 1725-2007 Paints, varnishes and plastics - Determination of non-volatile matter content (ISO 3251:2003, IDT) GB/T 2036 Terminology for printed circuits GB/T 2423.16-2022 Environmental testing Part 2: Test methods Test J and guidance. Mildew growth (IEC 60068-2-10.

2018, IDT)

GB/T 4677-2002 Test methods for printed boards (eqvIEC 60326-2.1990) GB/T 5547-2007 Determination of viscosity of resin finishing agents GB/T 6739-2022 Paints and varnishes - Determination of film hardness by pencil method (ISO 15184:2020, IDT) GB/T 13557-2017 Test methods for flexible copper clad materials for printed circuits GB/T 21862.5-2008 Paints and varnishes - Determination of density - Part 5: Hydrometer method (NFT30-028.1989, IDT) GB/T 22472-2008 Combustibility test of plastics for instrument and equipment parts (UL94.2001, MOD) GB/T 26125-2011 Six restricted substances in electrical and electronic products (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers) Determination of (IEC 62321:2008, IDT) SJ11171-2016 Single-sided and double-sided carbon film printed circuit boards