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

GB/T 43099-2023

**Metallic and other inorganic coatings - Electrodeposited
coatings of tin-cobalt alloy**

金属及其他无机覆盖层 锡钴合金电镀层

(English Translation)

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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 has been modified to adopt ISO 26945:2011 "Metal and other inorganic covering layers tin-cobalt alloy electroplating layers".

The technical differences between this document and ISO 26945:2011 and their reasons are as follows.

- Adjusted the scope of Chapter 1 to adapt to my country's technical conditions;
- Replaced ISO 9220 (see 6.4) with normatively quoted GB/T 31563 to adapt to my country's technical conditions and increase operability work nature;
- Replace ISO 2080, GB/T 12334 with ISO 2064, and GB/T 19349 with normatively quoted GB/T 3138.
- ISO 9587 and GB/T 19350 replaced ISO 9588 (see Chapter 3, 6.8) to adapt to my country's technical conditions and increase Operability;
- Replaced ISO 3497 and GB/T 31563 with normatively cited GB/T 16921 to replace ISO 9220 (see 6.4) to suit Respond to my country's technical conditions and increase operability;
- Replaced ISO 10289 (see 6.6) with normative reference GB/T 6461, and GB/T 6465 replaced ISO 4541 (see 6.6), to adapt to my country's technical conditions and increase operability;
- Replaced ISO 10587 (see 6.8) with normatively quoted GB/T 26107 to adapt to my country's technical conditions and increase operability work nature;
- Replaced ISO 4519 (see Chapter 7) with normatively quoted GB/T 12609 to adapt to my country's technical conditions and increase operability work nature;
- Added normative reference document GB/T 10125 (see 6.6) in order to adapt to my country's technical conditions;
- Change the bottom plating layer "5 μ m ~ 10 μ m thick initial copper plating" to "certain thickness of initial copper plating" to adapt to my country's electroplating Actual production conditions (see 6.3);
- Change the note in 6.6 to the third paragraph of this article to adapt to my country's technical conditions.

This document has made the following editorial changes.

- Change the title of 6.6 "Tin-Cobalt Alloy Coating Quality Assessment Test" to "Corrosion

Resistance" (see 6.6);

---Move the notes and contents related to Table 1 and Table 2 in 6.6 to Table 1 to facilitate the use of this document.

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

Introduction

The tin-cobalt alloy electroplating layer is characterized by a bright surface, similar to decorative chromium plating. The hardness and wear resistance of the tin-cobalt alloy electroplating layer are not Same as chromium plating, but similar to tin-nickel alloy electroplating (see GB/T 17462). Therefore, in terms of surface gloss, the tin-cobalt alloy electroplating layer can Replaces chrome plating. Since the tin-cobalt alloy electroplating layer has high current efficiency (more than 70%), it can be applied through rack plating and barrel plating processes.

Suitable for nuts, bolts, rivets, etc. of various complex shapes and sizes.

Metal and other inorganic coatings Tin cobalt alloy electroplating layer Warning---Some substances and processes required to be used in this document may cause health hazards if appropriate measures are not taken. this document There is no discussion of any health, safety or environmental hazards and regulations involved in the use of the document. Users of this document are responsible for creating Appropriate and feasible health, safety and environmental regulations, and take appropriate measures to comply with relevant national regulations. Compliance with this document is not intended means exemption from legal obligations.

1 Scope

This document specifies the identification and requirements for tin-cobalt alloy electroplating layers with a tin content (mass fraction) of 75% to 80% and the remainder being cobalt. tin cobalt Alloy plating can be used as an alternative to decorative chromium plating with a thickness of 0.1 μ m~0.3 μ m. Its hardness and wear resistance are different from those of chromium plating.

Similar to tin-nickel alloy plating.

This document applies to tin-cobalt alloy electroplating layers with a tin content (mass fraction) of 75% to 80% and cobalt in barrel plating and rack plating.

This document does not specify requirements for the surface condition of the base metal before electroplating.

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 3138 Terminology for surface treatment of metals and other inorganic coatings (GB/T 3138-2015, ISO 2080:2008, IDT) GB/T 6461 Rating of specimens and specimens after corrosion testing of metal and other inorganic coatings on metal substrates (GB/T 6461-2002, ISO 10289:1999, IDT) GB/T 6465 Metal and other inorganic coating corrosion paste corrosion test (CORR test) (GB/T 6465-2008, ISO 4541:1978, IDT) GB/T 10125 Artificial Atmosphere Corrosion Test Salt Spray Test (GB/T 10125-2021, ISO 9227:2017, MOD) GB/T 12334 Definition and general rules for thickness measurement of metal and other non-organic coatings (GB/T 12334-2001, idt ISO 2064:1996) GB/T 12609 Sampling procedures for counting and inspection of electrodeposited metal coverings and related finishes (GB/T 12609-2005, ISO 4519:1980, IDT) GB/T 16921 Metal coating thickness measurement X-ray spectrometry (GB/T 16921-2005, ISO 3497.

2000, IDT)

GB/T 19349 Metal and other inorganic coatings for steel pretreatment to reduce the risk of hydrogen embrittlement (GB/T 19349-2012, ISO 9587:2007, IDT) GB/T 19350 Treatment of steel coated with metal and other inorganic coatings to reduce the risk of hydrogen embrittlement (GB/T 19350-2012, ISO 9588:2007, IDT) GB/T 26107 Residual hydrogen embrittlement test of external threads and screws of metals and other inorganic coatings, plated and unplated metals Wedge method (GB/T 26107-2010, ISO 10587:2000, IDT) GB/T 31563 Scanning electron microscopy method for measuring metal coating thickness (GB/T 31563-2015, ISO 9220:1988, MOD)