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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 41275.2-2022

Process management for avionics - Aerospace and defence electronic systems containing lead-free solder - Part 2: Mitigation of deleterious effects of tin

Issued on: March 9, 2022 **Implemented on: October 1, 2022**

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foreword

This document is in accordance with GB/T

1.1-2020 Provisions of "Standardization Work Guidelines Part 1.Structure and Drafting Rules of Standardization Documents"

drafted.

This document is GB/T

Part 2 of 41275 Avionics Process Management for Aerospace and Defense Electronic Systems Containing Lead-Free Solders.

GB/T

41275 has released the following parts.

--- Part 2.Reducing the harmful effects of tin;

--- Part 3.System performance test methods containing lead-free solder and lead-free pins;

--- Part 21.Guidelines for the transition to lead-free electronics.

This document is modified to adopt IEC /TS

62647-2.2012 "Avionics Process Management Containing Lead-Free Solder Aerospace and Defense Electronics Department

System Part 2.Reducing the Harmful Effects of Tin", the document type is adjusted from ISO technical specifications to my country's national standards.

This document is related to IEC /TS

Compared with 62647-2.2012, there are many technical differences. In the outer margins of

the clauses involved, use

A vertical single line (|) is marked. See Appendix G for a list of these technical differences and their reasons.

The following editorial changes have been made to this document.

--- Added appendix F (informative) verification report on reducing PCB tin whisker hazards.

Please note that some content of this document may be patented. The issuing agency of this document assumes no responsibility for identifying patents.

This document is sponsored by the National Technical Committee for Standardization of Avionics Process Management (SAC/TC)

427) proposed and managed.

This document is drafted by. Luoyang Electro-Optical Equipment Research Institute of China Aviation Industry Corporation, China Aviation Comprehensive Technology Research Institute, Guangzhou Xingyuan Technology Co., Ltd.

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Harbin Institute of Technology.

Introduction

GB/T

41275 specifies the management requirements and technical requirements for the realization of lead-free in aerospace, defense and high-performance electronic systems.

Consists of 3 parts.

--- Part 2.Reducing the harmful effects of tin. The purpose is to regulate aerospace, defense and high performance electronic systems to reduce the harmful effects of tin

The technical approach adopted in response.

--- Part 3.Test methods for system performance containing lead-free solder and lead-free pins. The purpose is to specify lead-free solder and lead-free pipes

Performance test methods and test procedures for aerospace, defense, and high-performance electronic systems for feet.

--- Part 21.Guidelines for the transition to lead-free electronics. The purpose is to specify the management or system of the aerospace and defense electronic systems program

A working guide for engineering management to manage the transition to lead-free electronics.

Lead (Pb) is widely used in electronic solder and electronic component terminals and printed circuit boards. In electronic systems, lead-free tin plating is subject to

The growth of tin whiskers will cause various electrical faults such as parameter deviation, short circuit, burnout, etc.

After decades of research, people still do not fully understand the principles behind the growth of crystal structures.

The European Union (EU) has issued two directives..2002/95/EC

"Directive on Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment"

(RoHS) and.2002/96/EC

The Waste Electrical and Electronic Equipment Directive (WEEE), which restricts or prohibits waste produced after June.2006

Harmful substances such as lead (Pb) are used in the product. Similar "environmental" laws have been enacted in several Asian countries and several states in the United States, and many Asian

Electronics manufacturer announces full adoption of "green" production lines. The ban of lead-containing substances has caused many parts and circuit board suppliers to experience

Transition of lead-tin (SnPb) surface coatings to pure tin or other lead-free coatings.

This document is intended for use in purchasing, designing, manufacturing and servicing electronic assemblies using lead-free tin plated products to document their assurance that the assembly

The process of certifying performance, reliability, airworthiness, safety, and reliability. This document provides customers and suppliers with information on electronic system controls

A framework for communication and consultation on tin whisker risks.

The nature and meaning of "risks" arising from tin whiskers may vary widely to users of this document. As with any risk assessment, in any application

In use, the possibility of risk and failure and the consequences of risk and failure need to be considered. In choosing/deciding which controls to use etc.

When leveling, the potential whisker failure modes for a particular hardware/system must be carefully considered. This document focuses on the risks of tin whiskers. However, for tin

The current state of research on required risk is still unable to provide an accurate quantitative assessment of this risk and reliability. The degree of attention given to the risk of tin whiskers is divided into

There are three types of tin materials. unlimited, partially restricted and prohibited.

This document is intended to be compatible with IEC /TS

62647-1, IEC /PAS

62647-21 and IEC /PAS

62647-22 for use. proposals, solicitation

This document may be cited in proposals, statements of work, contracts and other documents. This document can be used independently or as an IEC /TS

62647-1's

part.

Avionics Process Management

Aerospace and Defense Electronic Systems with Lead-Free Solder

Part 2.Reducing the Harmful Effects of Tin

1 Scope

This document specifies the selection of control levels for tin whiskers during mitigation measures to reduce the harmful effects of lead-free tin in electronic systems.

selection, requirements for each control level, implementation methods, methods to reduce the impact of lead-free tin, part selection process, risk and mitigation effectiveness assessment and

Records and other technical requirements.

This document is suitable for aerospace, defense and high-performance electronic applications, and other high-performance and high-reliability electronic industries can refer to

use.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations

For documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies

in this document.

IPC-CC-830 Qualification and Performance of Electrically Insulating Composite Materials