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STN	**Zabezpečovanie výrobkov kozmického programu Kvalifikácia a obstarávanie dosiek plošných spojov**	**STN EN 16602-70-60** 31 0542

Space product assurance - Qualification and Procurement of printed circuit boards

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/19

Obsahuje: EN 16602-70-60:2019

Oznámením tejto normy sa ruší
STN EN 16602-70-10 (31 0542) z augusta 2015

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EUROPEAN STANDARD
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EN 16602-70-60

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Supersedes EN 16602-70-10:2015, EN 16602-70-11:2015

English version

Space product assurance - Qualification and Procurement of printed circuit boards

Assurance produit des projets spatiaux - Qualification et approvisionnement des circuits imprimés

Raumfahrtproduktsicherung - Qualifizierung und Beschaffung von Leiterplatten

This European Standard was approved by CEN on 9 November 2018.

CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN and CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN and CENELEC members are the national standards bodies and national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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European Foreword

This document (EN 16602-70-60:2019) has been prepared by Technical Committee CEN/CLC/TC 5 “Space”, the secretariat of which is held by DIN (Germany).

This document (EN 16602-70-60:2019) originates from ECSS-Q-ST-70-60C Corrigendum 1.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2020, and conflicting national standards shall be withdrawn at the latest by January 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document will supersede EN 16602-70-10:2015 and EN 16602-70-11:2015.

This document is the result of the merge and update of both superseded standards, including the implementation of Change Requests.

This document has been developed to cover specifically space systems and will the-refore have precedence over any EN covering the same scope but with a wider do-main of applicability (e.g. : aerospace).

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association.

This document has been developed to cover specifically space systems and has therefore precedence over any EN covering the same scope but with a wider domain of applicability (e.g. : aerospace).

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia , Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

PCBs are used for the mounting of electronic components to produce PCB assemblies that perform electrical functions. The PCBs are subjected to thermo-mechanical stress during assembly such as soldering of components, rework and repair under normal terrestrial conditions. In addition, the assembled PCBs are exposed to the launch and space environment. The reliability of the circuit depends on the robustness of the manufacturing processes, for which this standard specifies requirements. PCB technology needs detailed inspections to verify its reliability, which is specified for the qualification and procurement phases of the PCB technology.

1
Scope

This standard specifies the requirements for the PCB manufacturer, the procurement authority and the qualification authority for qualification and procurement of PCB technology.

ECSS-Q-ST-70-60 is applicable for all types of PCBs, including sequential, rigid and flexible PCBs, sculptured flex, HDI and RF PCBs.

This standard can be made applicable for other products combining mechanical and electrical functionality using additive or reductive manufacturing processes, as used in PCB manufacturing. Examples of such products are slip-rings, bus bars and flexible flat cables.

This standard may be tailored for the specific characteristics and constraints of a space project in conformance with ECSS-S-ST-00.

2
Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this ECSS Standard. For dated references, subsequent amendments to, or revision of any of these publications do not apply. However, parties to agreements based on this ECSS Standard are encouraged to investigate the possibility of applying the more recent editions of the normative documents indicated below. For undated references, the latest edition of the publication referred to applies.

EN reference	Reference in text	Title
EN 16601-00-01	ECSS-S-ST-00-01	ECSS system — Glossary of terms
EN 16602-10-09	ECSS-Q-ST-10-09	Space product assurance — Nonconformance control system
EN 16602-20	ECSS-Q-ST-20	Space product assurance — Quality assurance
EN 16602-70	ECSS-Q-ST-70	Space product assurance — Material, mechanical parts and processes
EN 16602-70-02	ECSS-Q-ST-70-02	Space product assurance — Thermal vacuum outgassing test for the screening of space materials
EN 16602-70-08	ECSS-Q-ST-70-08	Space product assurance — Manual soldering of high-reliability electrical connections
EN 16602-70-12	ECSS-Q-ST-70-12	Space product assurance — Design rules for printed circuit boards
EN 16602-70-21	ECSS-Q-ST-70-21	Space product assurance — Flammability testing for the screening of space materials
EN 16602-70-22	ECSS-Q-ST-70-22	Space product assurance — Control of limited shelf-life materials
EN 16602-70-29	ECSS-Q-ST-70-29	Space product assurance — Determination of offgassing products from materials and assembled articles to be used in a manned space vehicle crew compartment
EN 16602-70-38	ECSS-Q-ST-70-38	Space product assurance —High reliability soldering for surface mount and mixed technology printed circuit boards
	EN 9100:2016	Quality management systems – Requirements for aviation, space and defense organisations

EN reference	Reference in text	Title
	IEC 60326-2-am 1 (1992-06)	Printed boards. Part 2: Test methods
	IEC 60194 (1999-04)	Printed board design, manufacture and assembly — Terms and definitions
	IPC-A-600J (2016)	Acceptability of Printed Boards
	IPC-T-50M (2015)	Terms and definitions for interconnecting and packaging electronic circuits
	IPC-TM-650	Test methods manual
	IPC-1710A (2004)	OEM Standard for Printed Board Manufacturers' Qualification Profile
	IPC-4101E (2017)	Specification for base materials for rigid and multilayer printed boards
	IPC-4103A-WAM1 (2014)	Specification for Base Materials for High Speed/ High Frequency Applications
	IPC-4203A (2013)	Adhesive Coated Dielectric Films for Use as Cover Sheets for Flexible Printed Circuitry and Flexible Adhesive Bonding Films
	IPC-4204A-WAM1 (2014)	Flexible Metal-Clad Dielectrics for Use in Fabrication of Flexible Printed Circuitry
	IPC-6012D (2015)	Qualification and performance specification for rigid printed boards
	IPC-6012DS (2015)	Space and military avionics applications addendum to IPC-6012D
	IPC-6013D (2017)	Qualification and Performance Specification for Flexible Printed Boards
	IPC-6018C (2016)	Qualification and Performance Specification for High Frequency (Microwave) Printed Boards
	IPC-6018CS (2016)	Space and Military Avionics Applications Addendum to IPC-6018C
	ISO 9001:2015	Quality management systems - Requirements
	ISO-14644-1 (2015)	Cleanrooms and associated controlled environments - Part 1: Classification of air cleanliness by particle concentration