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STN	**Zabezpečovanie výrobkov kozmického programu Elektrické, elektronické a elektromechanické (EEE) komponenty**	**STN EN 16602-60** 31 0542

Space product assurance - Electrical, electronic and electromechanical (EEE) components

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

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English version

Space product assurance - Electrical, electronic and electromechanical (EEE) components

Assurance produit des projets spatiaux - Composants électriques, électroniques et électromécaniques (EEE)

Raumfahrtproduktsicherung - Elektrische, elektronische und elektromechanische (EEE) Bauteile

This European Standard was approved by CEN on 30 January 2023.

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European Foreword

This document (EN 16602-60:2023) has been prepared by Technical Committee CEN-CENELEC/JTC 5 “Space”, the secretariat of which is held by DIN.

This standard (EN 16602-60:2023) originates from ECSS-Q-ST-60C Rev. 3.

This document will supersede EN 16602-60:2015.

The main changes with respect to EN 16602-60:2015 are listed below:

- Implementation of Change Requests
- Topic “EQM components” added for all three classes
- Topic “Pure tin lead finish – risk analysis” moved from ECSS-Q-ST-60-13 to ECSS-Q-ST-60 as clause 9.Definition of “traceability information (trace code)” updated”

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).

Introduction

The objective of the EEE component selection, control, procurement and use requirements is to ensure that EEE components used in a space project enables the project to meet its mission requirements.

Important elements of EEE component requirements include:

a. component programme management,
b. component selection, evaluation and approval,
c. procurement,
d. handling and storage,
e. component quality assurance,
f. specific components, and
g. documentation.

The main tools which can be used to reach the objective are:

a. concurrent engineering,
b. standardization of component types,
c. characterization of components,
d. assessment of component manufacturers including declared competencies and processes,
e. testing, screening, lot acceptance and periodic testing,
f. procurement specifications,
g. control and inspection,
h. control of nonconforming materials,
i. assessment and use of existing component data,
j. application of specific control to mitigate risk for components with limited data or confidence, and
k. information management.

The basic approach is as follows:

- The customer of a given space project defines the EEE component requirements within the boundaries of this standard. They appear in the appropriate clauses of the project requirements as defined in ECSS-M-ST-10.
- The supplier defines a component control plan to implement those requirements into a system which enables, for instance, to control the selection, approval, procurement, handling in a schedule compatible with his requirements, and in a cost-efficient way.
- The supplier ensures that the applicable parts requirements are passed down to lower level suppliers and ensure that they are compliant to these parts requirements.

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Scope

This standard defines the requirements for selection, control, procurement and usage of EEE components for space projects.

This standard differentiates between three classes of components through three different sets of standardization requirements (clauses) to be met.

The three classes provide for three levels of trade-off between assurance and risk. The highest assurance and lowest risk is provided by class 1 and the lowest assurance and highest risk by class 3. Procurement costs are typically highest for class 1 and lowest for class 3. Mitigation and other engineering measures may decrease the total cost of ownership differences between the three classes. The project objectives, definition and constraints determine which class or classes of components are appropriate to be utilised within the system and subsystems.

a. Class 1 components are described in Clause 4.

b. Class 2 components are described in Clause 5

c. Class 3 components are described in Clause 6.

The requirements of this document apply to all parties involved at all levels in the integration of EEE components into space segment hardware and launchers.

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

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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 16601-10	ECSS-M-ST-10	Space project management — Project planning and implementation
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 16602-30-11	ECSS-Q-ST-30-11	Space product assurance — Derating — EEE components
EN 16602-60-02	ECSS-Q-ST-60-02	Space product assurance — ASIC and FPGA development
EN 16602-60-05	ECSS-Q-ST-60-05	Space product assurance — Generic procurement requirements for hybrids
EN 16602-60-12	ECSS-Q-ST-60-12	Space product assurance — Design, selection, procurement and use of die form monolithic microwave integrated circuits (MMICs)
EN 16602-60-13	ECSS-Q-ST-60-13	Space product assurance — Commercial electrical, electronic and electromechanical (EEE) components
EN 16602-60-14	ECSS-Q-ST-60-14	Space product assurance – Relifing procedure – EEE components
EN 16602-60-15	ECSS-Q-ST-60-15	Radiation hardness assurance – EEE components
EN 16602-70	ECSS-Q-ST-70	Space product assurance — Materials, mechanical parts and processes
	ESCC 20200	ESCC Basic Specification: Component Manufacturer Evaluation
	ESCC 21004	ESCC Basic Specification: Guidelines for incoming inspection of EEE components
	ESCC 22500	ESCC Basic Specification: Guidelines for displacement damage irradiation testing

	ESCC 22800	ESCC Basic Specification: ESA/SCC Non conformance Control System
	ESCC 22900	ESCC Basic Specification: Total Dose Steady-State Irradiation Test Method
	ESCC 24900	ESCC Basic Specification: Minimum requirements for controlling environmental contamination of components
	ESCC 25500	ESCC Basic Specification: Methodology for the detection of pure tin in the external surface finish of case and leads of EEE components
	ESCC QPL	ESCC qualified part list (https://escies.org)
	ESCC EPPL	ESCC European preferred parts list (https://escies.org)
	ESCC QML	ESCC qualified manufacturers list (https://escies.org)
	GEIA-STD-0005-2	Standard for Mitigating the Effects of Tin Whiskers in Aerospace and High Performance Electronic Systems.
	MIL QPLs	MIL qualified parts lists
	MIL QMLs	MIL qualified manufacturers lists
	NPSL	NASA Parts Selection List
	JAXA QPL	JAXA qualified parts list
	ESCC, MIL & JAXA specifications and standards called in the document	