



SLOVENSKI STANDARD SIST EN 16602-70-20:2015

01-januar-2015

Zagotavljanje varnih proizvodov v vesoljski tehniki - Ugotavljanje občutljivosti posrebrene bakrene žice in kabla na korozijo "rdeče kuge"

Space product assurance - Determination of the susceptibility of silver-plated copper wire and cable to "red-plague" corrosion

Raumfahrtproduktsicherung - Bestimmung der Anfälligkeit von silberbeschichtetem Kuperdraht und -kabeln für "red-plague"-Korrosion

Assurance produit des projets spatiaux - Détermination de la susceptibilité à la rouille rouge des fils et câbles en cuivre argenté

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49.140 Vesoljski sistemi in operacije Space systems and operations

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EUROPEAN STANDARD

EN 16602-70-20

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October 2014

ICS 49.090; 49.140

English version

Space product assurance - Determination of the susceptibility of silver-plated copper wire and cable to "red-plague" corrosion

Assurance produit des projets spatiaux - Détermination de la susceptibilité à la rouille rouge des fils et câbles en cuivre argenté

Raumfahrtproduktsicherung - Bestimmung der Anfälligkeit von silberbeschichtetem Kupferdraht und -kabeln für "red-plague"-Korrosion

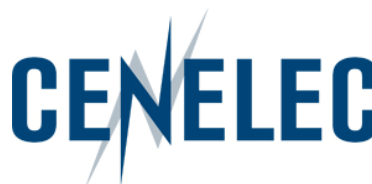
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Foreword

This document (EN 16602-70-20:2014) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16602-70-20:2014) originates from ECSS-Q-ST-70-20C.

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of an identical text or by endorsement, at the latest by April 2015, and conflicting national standards shall be withdrawn at the latest by April 2015.

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

This document has been prepared under a mandate 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Scope

This Standard gives details of an accelerated screening test method and acceptance criteria to determine the suitability of silver-plated wire and cable materials for use on spacecraft and associated equipment. The test method, which also determines the suitability of the associated fabrication processes, is based on the work of Anthony and Brown (1965). They established that “red-plague” originates at breaks in the silver-plating of copper wire strands in the presence of moisture and oxygen. The environmental test system artificially promotes “red-plague” corrosion under controlled laboratory conditions as a result of galvanic corrosion of the copper conductor core.

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 revisions 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 most 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 https://standards.iteh.ai/catalog/standards/sist/64007bff-b32d-42af-875d-e5a0c533201b/sist-en-16602-70-20-2015	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 – Materials, mechanical parts and processes

Terms, definitions and abbreviated terms

3.1 Terms defined in other standards

For the purpose of this Standard, the terms and definitions from ECSS-S-ST-00-01 apply, in particular for the following terms:

corrosion

3.2 Terms specific to the present standard

3.2.1 **batch**

quantity produced at one operation

NOTE One batch can be subdivided into several lots.

3.2.2 **red-plague**

red-coloured cuprous oxide (possibly with some black cupric oxide) corrosion product that forms when a galvanic cell is formed between copper and silver

NOTE The presence of humidity or moisture is a prerequisite.

3.3 Abbreviated terms

The abbreviated terms defined in ECSS-S-ST-00-01 apply.

4 Principles

The principles of the corrosion test to determine the susceptibility of silver plate copper wire and cable to red-plague corrosion is to submit the item to be tested (wire and cable) for to a certain period of time to an oxygen rich atmosphere at elevated temperature in order to evaluate the resistance of the item to deleterious effects as copper removal as a result of corrosion

For this purpose the activities related to corrosion test standardization requirements are specified in clause 5.

It is important to perform the work taking into account health and safety regulations, and in particular the national standards on this subject.

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5 Requirements

5.1 Preparatory conditions

5.1.1 Handling and storage

- a. The supplier shall handle all samples of wires and cables only with clean nylon or lint-free gloves.
- b. The supplier shall store the samples before and after testing in a clean area.

5.1.2 Identification

- a. The samples of wires and cables submitted for testing shall be identified by the following:
 1. Trade name
 2. Source
 3. Manufacturer's code number
 4. Batch number
 5. Date of manufacture
- b. The construction details of wires or cables shall include the following details:
 1. Form
 2. Principal dimensions
 3. Description of insulation and conductor materials
 4. Plating materials and their nominal thicknesses

5.1.3 Test equipment

- a. The supplier shall use the following test equipment for the test method:
 1. Microscope, at least $\times 20$ magnification with attachment to enable photomicrograph.
 2. Conical glass flasks
NOTE For example: Erlenmeyer > 250 ml.
 3. Natural two holed rubber stoppers