SLOVENSKI STANDARD
SIST EN 16602-70-14:2019

01-marec-2019

Zagotavljanje varnih proizvodov v vesoljski tehniki - Korozija

Space product assurance - Corrosion

Raumfahrtproduktsicherung - Korrosion

Assurance produit des projets spatiaux - Corrosion

Ta slovenski standard je istoveten z: **EN 16602-70-14:2018**

ICS:

49.040	Prevleke in z njimi povezani postopki, ki se uporabljajo v letalski in vesoljski industriji	Coatings and related processes used in aerospace industry
49.140	Vesoljski sistemi in operacije	Space systems and operations

SIST EN 16602-70-14:2019 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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ICS 49.040; 49.140

English version

Space product assurance - Corrosion

Assurance produit des projets spatiaux - Corrosion

Raumfahrtproduktsicherung - Korrosion

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European Foreword

This document (EN 16602-70-14:2018) has been prepared by Technical Committee CEN-CENELEC/TC 5 “Space”, the secretariat of which is held by DIN.

This standard (EN 16602-70-14:2018) originates from ECSS-Q-ST-70-14C.

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of an identical text or by endorsement, at the latest by June 2019, and conflicting national standards shall be withdrawn at the latest by June 2019.

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 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

This standard is aimed primarily at flight hardware including launchers but the principles can also be applied to ground support equipment.

Materials and processes used in ground support equipment, test equipment, hardware processing equipment, hardware packaging, hardware shipment and interfacing with flight hardware are to be controlled to prevent damage to or contamination of flight hardware.

This standard describes the requirements necessary to show that hardware is adequately protected from corrosion.

The purpose of this document is to:

- assess the risk of each form of corrosion,
- describe the corrosion protection requirements needed to mitigate the risks of corrosion, and
- define the acceptance criteria for the protected metal or alloy system that shows fitness for purpose over the life of the mission.

1
Scope

This document specifies the minimum requirements to qualify the materials and processes selected to provide corrosion protection. Additional testing can be performed to satisfy the requirements for materials and processes used in specific flight applications.

This standard specifies the behaviour of metals and alloys but it does not remove the responsibility for the degradation of other materials such as polymers or ceramics to be considered. This standard refers only to metallic materials.

This document does not cover the requirements for protection against stress corrosion cracking (SCC) which has its own dedicated standard ECSS-Q-ST-70-36.

It covers typical spacecraft and launcher programmes on ground for a period of no more than 10 years.

This standard may be tailored for the specific characteristic 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 16602-70	ECSS-Q-ST-70	Space product assurance - Materials, mechanical parts and processes
	ASTM D 5894-10 (2010)	Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)
	ISO 9227:2012	Corrosion tests in artificial atmospheres – Salt spray tests
	ISO 9588:2007	Metallic and other inorganic coatings - Post-coating treatments of iron or steel to reduce the risk of hydrogen embrittlement
	ISO 11130:2010	Corrosion of metals and alloys - Alternate immersion test in salt solution
	MIL-STD-1501F (2011)	Chromium Plating, Low Embrittlement, Electrodeposition

3
Terms, definitions and abbreviated terms

3.1 Terms from other standards

a. For the purpose of this Standard, the terms and definitions from ECSS-S-ST-00-01 apply.

b. For the purpose of this Standard, the terms and definitions from ECSS-Q-70-50 apply, in particular for the following terms:

1. representative sample

3.2 Terms specific to the present standard

3.2.1 corrosion

gradual degradation of materials produced by chemical reaction with the environment or with fluids in contact with materials

3.2.2 corrosion resistant alloys

alloys showing acceptable corrosion performance in most environments seen by space hardware

NOTE The use of corrosion resistant alloys does not mean that corrosion cannot occur in all environments.

3.2.3 corrosion-resistant aluminium alloys

1000, 3000, 5000, and 6000 series alloys and all clad alloys

3.2.4 corrosion-Resistant Steel (CRES)

steel having 12 % in weight or more chromium content

3.2.5 exterior surfaces

surface in contact with or exposed to direct action of the environment

NOTE All other surfaces are considered interior surfaces.

3.2.6 non-corrosion-resistant aluminium alloys

all other aluminium alloys not considered to be corrosion-resistant alloys

3.2.7 non-corrosion-resistant steel

steel having less than 12 % in weight chromium

3.3 Abbreviated terms

For the purpose of this Standard, the abbreviated terms from ECSS-S-ST-00-01 and the following apply:

Abbreviation	Meaning
AD	applicable document
AMS	aerospace material specification
ASTM	American Society for Testing and Materials
CRES	corrosion-resistant steel
CVD	chemical vapour deposition
°C	degree Celsius
DML	declared materials list
DMPL	declared mechanical parts list
DPL	declared process list
DRD	document requirements definition
EN	European Norm
H/W	hardware
ISO	International Standardisation Organisation
MIL-STD	military standard
MPa	Megapascal
NSST	Neutral Salt Spray Test
PVD	physical vapour deposition
RD	reference document
RH	relative humidity
SAE	Society of Automotive Engineers
SCC	stress-corrosion cracking
SST	salt spray test
UTS	ultimate tensile strength
UV	ultraviolet