

STN	Zabezpečovanie výrobkov kozmického programu Ultračistenie letových konštrukčných častí	STN EN 16602-70-54 31 0542
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Space product assurance - Ultracleaning of flight hardware

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. 08/19

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EUROPEAN STANDARD**EN 16602-70-54****NORME EUROPÉENNE****EUROPÄISCHE NORM**

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English version

Space product assurance - Ultracleaning of flight hardwareAssurance produit des projets spatiaux -
Ultranettoyage des matériels de volRaumfahrtproduktsicherung - Ultra-Reinigung von
Flug-Hardware

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

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Table of contents

European Foreword	7
Introduction	8
1 Scope	9
2 Normative references	10
3 Terms, definitions and abbreviated terms	11
3.1 Terms from other standards.....	11
3.2 Terms specific to the present standard	11
3.3 Abbreviated terms.....	13
3.4 Nomenclature	13
4 Principles	15
4.1 Cleaning techniques: Contamination removal	15
4.1.1 Introduction	15
4.1.2 Ultracleaning	18
4.1.3 Cleaning principles.....	19
4.1.4 Trade-off process	20
4.1.5 Selection of an end-to-end cleaning process.....	21
5 Requirements	23
5.1 Specifying process.....	23
5.1.1 General	23
5.1.2 Specifying process means	23
5.2 Definition of end-to-end cleaning process	24
5.2.1 Test samples.....	24
5.2.2 Definition of critical contamination and tracers	24
5.2.3 Application process for critical contaminants and tracers	25
5.2.4 Selection of analytical techniques	26
5.2.5 Definition of test matrix.....	26
5.2.6 Cleaning processes.....	26
5.2.7 Cleaning efficacy.....	27
5.3 Validation of end-to-end cleaning process	29

EN16602-70-54:2019 (E)

5.4	Packaging, containerization, transportation, storage	31
Annex A (normative) Request for ultracleaning - DRD		32
A.1	DRD identification	32
A.2	Purpose and objective	32
A.3	Expected response	32
A.3.1	Scope and content	32
A.3.2	Special remarks	32
Annex B (normative) Ultracleaning work proposal - DRD.....		33
B.1	DRD identification	33
B.2	Purpose and objective	33
B.3	Expected response	33
B.3.1	Scope and content	33
B.3.2	Special remarks	34
Annex C (normative) Ultracleaning process report - DRD		35
C.1	DRD identification	35
C.2	Purpose and objective	35
C.3	Expected response	35
C.3.1	Scope and content	35
C.3.2	Special remarks	36
Annex D (informative) Good cleanability design guidelines		37
D.1	Conception and design guidelines	37
D.1.1	General	37
D.1.2	Corners and edges	38
D.1.3	Weld seams at corners and edges	39
D.1.4	Transitions	40
D.1.5	Fixed/separable joins:	40
Annex E (informative) Cleaning techniques.....		42
E.1	Blasting cleaning techniques	42
E.1.1	Compressed air blasting.....	42
E.1.2	Wet compressed air blasting	42
E.1.3	Pressurized fluid blasting	43
E.1.4	Low-pressure water jet blasting.....	43
E.1.5	Elutriation blasting.....	44
E.1.6	Centrifugal blasting	44
E.1.7	Steam blasting	45

E.1.8	CO ₂ pellet cleaning	45
E.1.9	Accelerated CO ₂ snow cleaning	46
E.2	Mechanical cleaning	47
E.2.1	Wiping.....	47
E.2.2	Brushing and sweeping.....	48
E.2.3	Scraping and abrading.....	48
E.2.4	Grinding	49
E.2.5	Beating off.....	49
E.3	Fluidic cleaning.....	50
E.3.1	Washing and rinsing.....	50
E.3.2	Blowing off cleaning	50
E.3.3	Suction cleaning.....	51
E.3.4	Ultrasonic cleaning.....	51
E.4	Chemical cleaning	52
E.4.1	General principle of chemical cleaning	52
E.4.2	Etching and leaching.....	52
E.4.3	Chemical reaction	52
E.5	Solvent cleaning	53
E.5.1	Detaching and stripping	53
E.6	Thermal cleaning	53
E.6.1	General principle of thermal cleaning	53
E.6.2	Evaporating.....	53
E.6.3	Scarfig.....	54
E.6.4	Decomposing	54
E.7	Special cleaning	55
E.7.1	Hot vacuum purge.....	55
E.7.2	Hot N ₂ purge	55
E.7.3	Plasma Chamber cleaning	56
E.7.4	UV-light cleaning.....	56
E.7.5	LASER beam cleaning.....	57
E.7.6	Supercritical CO ₂ Cleaning.....	57
E.7.7	Liquid Peel Cleaning	58
Annex F (informative) Contamination detection techniques		59
F.1	Particulate contamination.....	59
F.1.1	General.....	59
F.1.2	Assessment matrix.....	59
F.2	Chemical molecular contamination	63

EN16602-70-54:2019 (E)

F.3	Microbiological contamination	63
Annex G (informative) Witness sample design.....		64
G.1	Example witness sample design	64
Annex H (informative) Examples for cleanliness classification		65
H.1	Particles.....	65
H.1.1	Classification system.....	65
H.1.2	Examples for cleaning efficacy	66
H.2	Molecular contamination	67
H.2.1	Classification system.....	67
H.2.2	Examples for cleaning efficacy	67
Bibliography.....		69

Figures

Figure 4-1:	Typical types of molecular and particulate contamination	15
Figure 4-2:	Relationship between van der Waals force and weight in dependence upon particle diameter (model according to Hamaker for Al particles on Al substrate)	16
Figure 4-3:	Influences on the cleaning efficacy	17
Figure 4-4:	Available cleaning principles and related techniques	19
Figure 4-5:	Two stage trade-off method.....	20
Figure 4-6:	Logic flow for the selection and optimisation of an end-to-end cleaning process for hardware.....	22
Figure 5-1:	Cleanliness validation logic for using witness plates.....	30
Figure 5-2:	Cleanliness validation logic for using products or components	30
Figure D-1 :	Design of corners and edges	39
Figure D-2 :	Material transitions joined by a weld seam.....	40
Figure D-3 :	Materials joined by a weld seam	40
Figure G-1 :	Test sample geometry to assess the cleaning efficacy of a certain cleaning technique (left) and composition of the test sample surface (right)	64

Tables

Table 4-1:	Typical cleanliness levels and their verification techniques on spacecraft surfaces	18
Table F-1 :	Comparison of different direct particle detection methods	62
Table H-1 :	Selected SCP classes for cleanrooms and associated controlled environments	65

Table H-2 : Examples of cleaning efficacies on different substrates	66
Table H-3 : Overview of ISO SCC molecular contamination classes	67
Table H-4 : Examples of cleaning efficacies on different substrates	67

European Foreword

This document (EN16602-70-54:2019) has been prepared by Technical Committee CEN-CENELEC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN16602-70-54:2019) originates from ECSS-Q-ST-70-54C.

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 September 2019, and conflicting national standards shall be withdrawn at the latest by September 2019.

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 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 ECSS Standard describes the procedures to be used to clean to a level of cleanliness beyond the scope of the ECSS-Q-ST-70-01, and to control the cleanliness level of flight hardware prior to and following a posteriori to the application of the ultracleaning process. The intended objective of the ultracleaning process is to remove all surface contamination (particulates, biologic material cell debris and chemical molecular contamination) on flight hardware, with no specific limit in geometric dimension or contamination levels. This includes removal of biological material for avoidance of false positive results during investigation of extra-terrestrial samples or environments.

1 Scope

This standard addresses process descriptions, process validation, cleanliness control and monitoring, recontamination prevention, quality assurance as follows:

PROCESSES DESCRIPTIONS, including

- Detergent cleaning
- Alcohol cleaning
- Ultrapure water cleaning
- Liquid boundary layer disruption cleaning
- Multiple solvent cleaning (JPL procedure)
- Vacuum bakeout
- Supercritical fluids cleaning
- Carbon dioxide snow cleaning
- Plasma cleaning
- Pyrolysis
- Criteria for selecting other/novel processes

PROCESS VALIDATION

- Test material selection
- Preparation of test materials for process application
- Deposition of contaminants
- Description of test conditions
- Verification of cleanliness level

CLEANLINESS CONTROL AND MONITORING, including

- Micro/nano imaging techniques
- Spectrometry techniques
- Spectroscopy techniques
- Chromatography techniques

RECONTAMINATION PREVENTION

- Packaging systems
- Protective covers
- Storage

QUALITY ASSURANCE

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 16602-10-09	ECSS-Q-ST-10-09	Space product assurance - Nonconformance control system
EN 16602-20-08	ECSS-Q-ST-20-08	Space product assurance - Storage, handling and transportation of spacecraft hardware
EN 16602-70	ECSS-Q-ST-70	Space product assurance - Materials, mechanical parts and processes
EN 16602-70-01	ECSS-Q-ST-70-01	Space product assurance - Cleanliness and contamination control
	ISO 14644-9: 2012	Cleanrooms and associated controlled environments - Part 9: Classification of surface cleanliness by particle concentration
	ISO 14644-10: 2013	Cleanrooms and associated controlled environments - Part 10: Classification of surface cleanliness by chemical concentration

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