Irish Standard
I.S. EN 16602-70-05:2014

Space product assurance - Detection of organic contamination surfaces by infrared spectroscopy

I.S. EN 16602-70-05:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

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Space product assurance - Detection of organic contamination surfaces by infrared spectroscopy

Assurance produit des projets spatiaux - Détection des surfaces de contamination organique par spectroscopie infrarouge

Raumfahrtproduktsicherung - Detektion von organischen Kontaminationen auf Oberflächen mit Infrarotspektroskopie

This European Standard was approved by CEN on 20 March 2014.

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Foreword

This document (EN 16602-70-05:2014) has been prepared by Technical Committee CEN/CLC/TC 5 “Space”, the secretariat of which is held by DIN.

This standard (EN 16602-70-05:2014) originates from ECSS-Q-ST-70-05C.

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of an identical text or by endorsement, at the latest by April 2015, and conflicting national standards shall be withdrawn at the latest by April 2015..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

Introduction

One or more of the following organic substances can contaminate spacecraft materials and hardware, as well as vacuum chambers:

- Volatile condensable products of materials out-gassing under vacuum.
- Volatile condensable products of off-gassing materials.
- Back-streaming products from pumping systems.
- Handling residues (e.g. human grease).
- Residues of cleaning agents.
- Non-filtered external pollution.
- Creep of certain substances (e.g. silicones).

There are several methods for identifying organic species, such as mass spectrometry, gas chromatography and infrared spectroscopy, or a combination of these methods. Infrared spectroscopy, which is the most widely used, is a simple, versatile and rapid technique providing high resolution qualitative and quantitative analyses. The technique is therefore baseline for the present Standard.

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Scope

This Standard defines test requirements for detecting organic contamination on surfaces using direct and indirect methods with the aid of infrared spectroscopy.

The Standard applies to controlling and detecting organic contamination on all manned and unmanned spacecraft, launchers, payloads, experiments, terrestrial vacuum test facilities, and cleanrooms.

The following test methods are covered:

- Direct sampling of contaminants
- Indirect sampling of contaminants by washing and wiping

Several informative annexes are included to give guidelines to the following subjects:

- Qualitative and quantitative interpretation of spectral data
- Calibration of infrared equipment
- Training of operators
- Use of molecular witness plates
- Collecting molecular contamination
- Contact test to measure the contamination transfer of materials
- Immersion test to measure the extractable contamination potential of materials
- Selection criteria for test equipment

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