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Space engineering - Propulsion general requirements

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Raumfahrttechnik - Antrieb, allgemeine Anforderungen und Grundsätze

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Foreword

This document (EN 16603-35:2014) has been prepared by Technical Committee CEN/CLC/TC 5 “Space”, the secretariat of which is held by DIN.

This standard (EN 16603-35:2014) originates from ECSS-E-ST-35C Rev. 1.

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of an identical text or by endorsement, at the latest by March 2015, and conflicting national standards shall be withdrawn at the latest by March 2015.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

The requirements in this Standard (ECSS-E-ST-35) and in the three space propulsion standards dedicated to particular type of propulsion (ECSS-E-ST-35-01, ECSS-E-ST-35-02 and ECSS-E-ST-35-03) are organized with a typical structure as follows:

- Functional
- Constraints
- Interfaces
- Design
- GSE
- Materials
- Verification
- Production and manufacturing
- In–service (operation and disposal)
- Deliverables.

All the normative references, terms, definitions, abbreviated terms, symbols and DRDs of the ECSS Propulsion standards are collected in this ECSS-E-ST-35 standard.

The ECSS Propulsion standards structure is as follows.

ECSS-E-ST-35 Propulsion general requirements

- Standards, covering particular type of propulsion
  - ECSS-E-ST-35-01 Liquid and electric propulsion for spacecrafts
  - ECSS-E-ST-35-02 Solid propulsion for spacecrafts and launchers
  - ECSS-E-ST-35-03 Liquid propulsion for launchers.
- Standard covering particular propulsion aspects
  - ECSS-E-ST-35-06 Cleanliness requirements for spacecraft propulsion hardware
  - ECSS-E-ST-35-10 Compatibility testing for liquid propulsion systems

Further information on the use of conventional propellants, pressurants, simulants and cleaning agents is given in Annex M.

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Scope

This Standard defines the regulatory aspects that apply to the elements and processes of liquid propulsion for launch vehicles and spacecraft, solid propulsion for launch vehicles and spacecraft and electric propulsion for spacecraft. The common requirements for the three types of space propulsion are written in the ECSS-E-ST-35 document. The specific requirements for each type of propulsion are given in ECSS-E-ST-35-01, ECSS-E-ST-35-02 and ECSS-E-ST-35-03. It specifies the activities to be performed in the engineering of these propulsion systems and their applicability. It defines the requirement for the engineering aspects such as functional, physical, environmental, quality factors, operational and verification.

Other forms of propulsion (e.g. nuclear, nuclear–electric, solar–thermal and hybrid propulsion) are not presently covered in this issue of the Standard.

This standard applies to all types of space propulsion systems used in space applications, including:

- Liquid and electric propulsion for spacecraft.
- Solid propulsion for launch vehicles and spacecraft;
- Liquid propulsion for launch vehicles.

This standard may be tailored for the specific characteristic and constrains 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 16603-10	ECSS-E-ST-10	Space engineering – System engineering general requirements
EN 16603-10-02	ECSS-E-ST-10-02	Space engineering – Verification
EN 16603-35-06	ECSS-E-ST-35-06	Space engineering – Cleanliness requirements for spacecraft propulsion hardware
EN 16603-31	ECSS-E-ST-31	Space engineering – Thermal control general requirements
EN 16603-32	ECSS-E-ST-32	Space engineering – Structural general requirements