

Space engineering - Fracture control

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 16603-32-01:2021 sisaldab Euroopa standardi EN 16603-32-01:2021 ingliskeelset teksti.	This Estonian standard EVS-EN 16603-32-01:2021 consists of the English text of the European standard EN 16603-32-01:2021.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
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English version

## Space engineering - Fracture control

Ingénierie spatiale - Maîtrise de la rupture

Raumfahrttechnik - Überwachung des Rissfortschritts

This European Standard was approved by CEN on 5 December 2021.

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## European Foreword

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This document (EN 16603-32-01:2021) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

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 supersedes EN 16603-32-01:2014.

The main changes with respect to EN 16603-32-01:2014 are listed below:

- Implementation of change requests
- Replacement of term "non-destructive inspection (NDI)" by "non-destructive testing (NDT)" in the whole document
- Update of Scope
- Removal of information about the NASA Space Shuttle program (STS)
- Update of Normative References and Terms, definitions and abbreviated terms
- Addition of Nomenclature
- Addition of clause 8.2.7 "Pressurized components with non-hazardous LBB failure mode"
- Addition of clause 8.9 "Alloys treated with electric discharge manufacturing (EDM)"
- Addition of clause 11.2.2.5 "Safe life composite, bonded and sandwich structures"
- Addition of clause 11.2.2.6 "Metallic parts classified as PFCI according to 11.2.2.1"
- Addition of clause 11.2.2.7 "Fasteners classified as PFCI according to 11.2.2.1"
- Addition of clause 11.2.2.8 "NDT of fusion welded joints in pressure components, as per 10.3.1p"
- Several clauses and requirements moved to EN 16602-70-15 (equivalent to ECSS-Q-ST-70-15)



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.

# 1

## Scope

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This ECSS Engineering Standard specifies the fracture control requirements to be imposed on space segments of space systems and their related GSE.

The fracture control programme is applicable for space systems and related GSE where structural failure can result in a catastrophic hazard in accordance with the definition of ECSS-Q-ST-40 or alternative applicable document specified by the customer like those applicable to the ISS or Exploration systems or payloads.

The requirements contained in this Standard, when implemented, also satisfy the fracture control requirements applicable to the NASA and ISS hardware.

The NASA nomenclature differs in some cases from that used by ECSS. When ISS or Exploration-specific requirements and nomenclature are included, they are identified as such.

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 16603-10-02	ECSS-E-ST-10-02	Space engineering – Verification
EN 16603-10-03	ECSS-E-ST-10-03	Space engineering - Testing
EN 16603-32	ECSS-E-ST-32	Space engineering – Structural general requirements
EN 16603-32-02	ECSS-E-ST-32-02	Space engineering – Structural design and verification of pressurized hardware
EN 16602-20	ECSS-Q-ST-20	Space product assurance – Quality assurance
EN 16602-40	ECSS-Q-ST-40	Space product assurance – Safety
EN 16602-70	ECSS-Q-ST-70	Space product assurance – Materials, mechanical parts and processes
EN 16602-70-15	ECSS-Q-ST-70-15	Space product assurance - Non-destructive testing
	ECSS-Q-ST-70-36	Space product assurance – Material selection for controlling stress-corrosion cracking
	ECSS-Q-ST-70-45	Space product assurance – Mechanical testing of metallic materials
	DOT/FAA/AR-MMPDS	Metallic Materials Properties Development and Standardization (MMPDS) (former MIL-HDBK-5)
	EN ISO 6520-1	Welding and allied processes – Classification of geometric imperfections in metallic materials – Part 1: Fusion welding
	ISO 17659	Welding – Multilingual terms for welded joints with illustrations