



**SLOVENSKI STANDARD**  
**SIST EN 16603-32-08:2016**

**01-november-2016**

**Nadomešča:**  
**SIST EN 14607-8:2005**

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**Vesoljska tehnika - Materiali**

Space engineering - Materials

Raumfahrttechnik - Werkstoffe

Ingénierie spatiale - Matériaux

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**Ta slovenski standard je istoveten z: EN 16603-32-08:2016**

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**ICS:**

49.140 Vesoljski sistemi in operacije Space systems and operations

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EUROPEAN STANDARD

EN 16603-32-08

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August 2016

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English version

## Space engineering - Materials

Ingénierie spatiale - Matériaux

Raumfahrttechnik - Werkstoffe

This European Standard was approved by CEN on 22 May 2016.

CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN and CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN and CENELEC members are the national standards bodies and national electrotechnical committees of 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 United Kingdom.

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Avenue Marnix 17, B-1000 Brussels**

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## European Foreword

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This document (EN 16603-32-08:2016) has been prepared by Technical Committee CEN/CLC/TC 5 “Space”, the secretariat of which is held by DIN.

This standard (EN 16603-32-08:2016) originates from ECSS-E-ST-32-08C 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 February 2017, and conflicting national standards shall be withdrawn at the latest by February 2017.

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 14607-8:2004.

The main changes with respect to EN 14607-8:2004 are listed below:

- new EN number and modified title, <https://standards.iteh.ai/catalog/standards/sist/669ac861-97c4-4b3a-b9c6-8377f330786c/en-16603-32-08-2016>
- Reorganization of the content of the document to separate descriptive text and requirements, including clarification, modification of requirements and implementation of change requests,
- Alignment of the three Standards EN 16603-32-08 (based on ECSS-E-ST-32-08C Rev.1), EN 16602-70 (based on ECSS-Q-ST-70C Rev.1) and EN 16602-70-71 (based on ECSS-Q-ST-70-71C),
- Deletion of deletion of clauses 4.2, 4.4, 4.9, 4.10, 4.12, 4.13 and Table 1.

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.

# 1 Scope

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ECSS-E-ST-32-08 specifies the mechanical engineering requirements for materials. This Standard also encompasses the mechanical effects of the natural and induced environments to which materials used for space applications can be subjected.

This standard specifies requirements for the establishment of the mechanical and physical properties of the materials to be used for space applications, and the verification of these requirements.

Verification includes destructive and non-destructive test methods. Quality assurance requirements for materials (e.g. procurement and control) are covered by ECSS-Q-ST-70.

This standard may be tailored for the specific characteristics and constraints 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 16603-32	ECSS-E-ST-32	Space engineering - Structural
EN 16602-70	ECSS-Q-ST-70	Space product assurance - Materials, mechanical parts and processes
EN 16602-70-37	ECSS-Q-ST-70-37	Space product assurance - Determination of the susceptibility of metals to stress-corrosion cracking
EN 16602-70-71	ECSS-Q-ST-70-71	Space product assurance - Material, processes and their data selection
	EN 4179:2005	Aerospace series - Qualification and approval of personnel for non-destructive testing



## Terms, definitions and abbreviated terms

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### 3.1 Terms and definitions from other standards

- a. For the purpose of this standard, the terms and definitions from ECSS-S-ST-00-01 and ECSS-E-ST-32 apply, in particular for the followings:
1. A-basis design allowable (A-value)
  2. B-basis design allowable (B-value)
  3. corrosion

### 3.2 Terms specific to the present standard

#### 3.2.1 composite sandwich construction

panels composed of a lightweight core material, such as honeycomb, foamed plastic, and so forth, to which two relatively thin, dense, high-strength or high stiffness faces or skins are adhered

#### 3.2.2 material design allowable

material property that has been determined from test data on a probability basis and has been chosen to assure a high degree of confidence in the integrity of the completed structure

#### 3.2.3 micro-yield

applied force to produce a residual strain of  $1 \times 10^{-6}$  mm/m along the tensile or compression loading direction

#### 3.2.4 polymer

high molecular weight organic compound, natural or synthetic, with a structure that can be represented by a repeated small unit, the mer

NOTE E.g. polyethylene, rubber, and cellulose.

### 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
ASTM	American Society for Testing Materials
CFRP	carbon fibre reinforced plastic
CMC	ceramic matrix composites
CME	coefficient of moisture expansion
CTE	coefficient of thermal expansion
DRD	document requirements definition
EB	electron beam
EN	European Standard
K <sub>IC</sub>	plane strain critical stress intensity factor
K <sub>ISCC</sub>	plane strain critical stress intensity factor for a specific environment
LEO	low Earth orbit
MIG	metal inert gas
MMC	metal matrix composite
NDE	non-destructive evaluation
NDI	non-destructive inspection
NDT	non-destructive test
PTFE	polytetrafluoroethylene
SCC	stress-corrosion cracking
STS	space transportation system
TIG	tungsten inert gas
UD	uni-directional
UV	ultra violet

### 3.4 Nomenclature

The following nomenclature applies throughout this document:

- The word “shall” is used in this standard to express requirements. All the requirements are expressed with the word “shall”.
- The word “should” is used in this standard to express recommendations. All the recommendations are expressed with the word “should”.

NOTE It is expected that, during tailoring, recommendations in this document are either converted into requirements or tailored out.

- The words “may” and “need not” are used in this standard to express positive and negative permissions, respectively. All the positive

permissions are expressed with the word “may”. All the negative permissions are expressed with the words “need not”.

- d. The word “can” is used in this standard to express capabilities or possibilities, and therefore, if not accompanied by one of the previous words, it implies descriptive text.

NOTE In ECSS “may” and “can” have completely different meanings: “may” is normative (permission), and “can” is descriptive.

- e. The present and past tenses are used in this standard to express statements of fact, and therefore they imply descriptive text.

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