SLOVENSKI STANDARD
SIST EN 16603-32:2014

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Nadomešča:
SIST EN 14607-2:2005

Vesoljska tehnika - Konstrukcija, splošne zahteve

Space engineering - Structural general requirements

Raumfahrttechnik - Strukturen, allgemeine Anforderungen

Ingénierie spatiale - Structure, exigences générales

Ta slovenski standard je istoveten z: EN 16603-32:2014

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49.140	Vesoljski sistemi in operacije	Space systems and operations

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English version

Space engineering - Structural general requirements

Ingénierie spatiale - Structure, exigences générales

Raumfahrttechnik - Strukturen, allgemeine Anforderungen

This European Standard was approved by CEN on 1 March 2014.

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Foreword

This document (EN 16603-32:2014) has been prepared by Technical Committee CEN/CLC/TC 5 “Space”, the secretariat of which is held by DIN.

This standard (EN 16603-32:2014) originates from ECSS-E-ST-32C 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of an identical text or by endorsement, at the latest by February 2015, and conflicting national standards shall be withdrawn at the latest by February 2015.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 supersedes EN 14607-2:2004.

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

ECSS-E-ST-32C (Space engineering – Structural) defines the mechanical engineering requirements for structural engineering.

This Standard specifies the requirements to be considered in all engineering aspects of structures: requirement definition and specification, design, development, verification, production, in-service and eventual disposal.

The Standard applies to all general structural subsystem aspects of space products including: launch vehicles, transfer vehicles, re-entry vehicles, spacecraft, landing probes and rovers, sounding rockets, payloads and instruments, and structural parts of all subsystems.

This Standard may be tailored for the specific characteristics 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 revisions 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 most 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 16603-32-01	ECSS-E-ST-32-01	Space engineering – Fracture control
EN 16603-32-02	ECSS-E-ST-32-02	Space engineering – Structural design and verification of pressurized hardware
EN 16603-32-10	ECSS-E-ST-32-10	Space engineering – Reliability based mechanical factors of safety
EN 16602-70-36	ECSS-Q-ST-70-36	Space product assurance – Material selection for controlling stress-corrosion cracking
EN 16602-70-37	ECSS-Q-ST-70-37	Space product assurance – Determination of the susceptibility of metals to stress-corrosion cracking

3 Terms, definitions and abbreviated terms

3.1 Terms from other standards

For the purpose of this Standard, the terms and definitions from ECSS-S-ST-00-01 apply.

3.2 Terms specific to the present standard

3.2.1 A-basis design allowable (A-value)

mechanical property value above which at least 99 % of the population of values is expected to fall, with a confidence level of 95 %

3.2.2 B-basis design allowable (B-value)

mechanical property value above which at least 90 % of the population of values is expected to fall, with a confidence level of 95 %

3.2.3 buckling

not stable equilibrium of a structure under loads applied statically or dynamically

NOTE Buckling include snapping of slender beams, buckling of flat plates, buckling of cylindrical panels, three dimensionally curved shells, rib crippling, and skin buckling of a sandwich.

3.2.4 composite material

combination of materials different in composition or form on a macro scale

NOTE 1 Composite materials provide improved characteristics not obtainable by any of the original components acting alone

NOTE 2 The constituents retain their identities in the composite.

NOTE 3 Normally the constituents can be physically identified, and there is an interface between them.

NOTE 4 Composites include

- fibrous (composed of fibres, usually in a matrix),

- laminar (layers of materials), and
- hybrid (combinations of any of the above).

NOTE 5 Composites material can be metallic, non-metallic or a combination thereof.

3.2.5 composite structure

structure fully or partially made of composite materials

3.2.6 contributing loads

loads which decrease the margin of safety.

3.2.7 damage tolerance

capability of a structure to resist failure due to the presence of flaws, cracks, or other damage for a specified period of usage without inspection or repair.

3.2.8 design allowable

statistically based strength capability with respect to a failure mode

NOTE For example in terms of load resistance, stress resistance, or strain limit with respect to rupture, collapse, detrimental deformation.

3.2.9 design factor

factor used in the determination of DLL to account for uncertainties

NOTE Design factor accounts for uncertainties related to loads, models and project programmatic aspects (i.e. protoflight approach, uncertainty in launcher environment, maturity of design, growth potential and other design considerations).

3.2.10 design limit load (DLL)

limit load multiplied by a design factor

NOTE Design factors are defined in ECSS-E-ST-32-10.

3.2.11 design load (DL)

design limit load or design yield load or design ultimate load

3.2.12 design parameters

physical features which influence the design performances

NOTE According to the nature of the design variables, different design problems can be identified such as:

- structural sizing for the dimensioning of beams, shells;
- shape optimization;
- material selection;
- structural topology.