

STN	Kozmická technika. Tepelná kontrola, všeobecné požiadavky.	STN EN 16603-31 31 0543
------------	---	---

Space engineering - Thermal control general requirements

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/15

Obsahuje: EN 16603-31:2014

Oznámením tejto normy sa ruší
STN EN 14607-1 (31 0531) z januára 2005

120142

Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, odbor SÚTN, 2015
Podľa zákona č. 264/1999 Z. z. v znení neskorších predpisov sa môžu slovenské technické normy
rozmnožovať a rozširovať iba so súhlasom Úradu pre normalizáciu, metrológiu a skúšobníctvo SR.

English version

Space engineering - Thermal control general requirements

Ingénierie spatiale - Contrôle thermique, exigences
généralesRaumfahrttechnik - Thermalkontrolle, allgemeine
Anforderungen

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

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.



**CEN-CENELEC Management Centre:
Avenue Marnix 17, B-1000 Brussels**

Table of contents

Foreword	5
1 Scope	6
2 Normative references	7
3 Terms, definitions and abbreviated terms	8
3.1 Terms from other standards.....	8
3.2 Terms specific to the present standard	8
3.3 Abbreviated terms.....	19
4 Requirements	21
4.1 Mission	21
4.1.1 General.....	21
4.1.2 Ground and pre-launch	21
4.1.3 Launch and ascent.....	21
4.1.4 Planetary orbital phases.....	22
4.1.5 Interplanetary phases.....	22
4.1.6 Planetary natural environment	22
4.1.7 Docking, docked and separation phases.....	22
4.1.8 Descent, entry and landing.....	23
4.1.9 Post-landing phases.....	23
4.2 Performance	23
4.2.1 General.....	23
4.2.2 High temperature range	24
4.2.3 Cryogenic temperature range.....	24
4.2.4 Functionality.....	25
4.3 Requirements towards other subsystems	25
4.3.1 General.....	25
4.3.2 Mechanical.....	25
4.3.3 Electrical	26
4.3.4 AOCS.....	26
4.3.5 TM/TC.....	27

4.3.6	OBDH and S/W	27
4.3.7	Launcher	27
4.3.8	GSE	28
4.3.9	ECLS	28
4.4	Design	28
4.4.1	General	28
4.4.2	Budget allocation	29
4.4.3	Parts, materials and processes (PMP)	29
4.4.4	EEE components	29
4.4.5	Lifetime	29
4.4.6	Predictability and testability	29
4.4.7	Flexibility	29
4.4.8	Integration and accessibility	29
4.4.9	Reliability	30
4.4.10	Interchangeability	30
4.4.11	Maintenance	30
4.4.12	Safety	30
4.4.13	Availability	30
4.5	Verification	30
4.5.1	Overview	30
4.5.2	Verification requirements specific to TCS	30
4.5.3	Thermal balance test (TBT)	32
4.6	Production and manufacturing	34
4.6.1	Procurement	34
4.6.2	Manufacturing process	35
4.6.3	Quality management	35
4.6.4	Cleanliness and Contamination	35
4.6.5	Integration	36
4.6.6	Identification and Marking	36
4.6.7	Packaging, handling, transportation	36
4.6.8	Storage	36
4.6.9	Repair	36
4.7	In-service requirements	36
4.8	Product assurance	37
4.9	Deliverables	37
4.9.1	General	37
4.9.2	Hardware	37

EN 16603-31:2014 (E)

4.9.3	Documentation.....	37
4.9.4	Mathematical models	39
5 Document requirements definitions (DRD) list		40
Bibliography.....		64

Figures

Figure 3-1: Temperature definitions for thermal control system (TCS).....	9
Figure 3-2: Temperature definitions for unit thermal design	16
Figure 4-1: Product exchange between the system, TCS and the supplier or manufacturer	38

Tables

Table 5-1: ECSS-E-ST-31 DRD list	41
Table G-1 : Definitions and requirements for the cryogenic temperature range used in this Standard	62
Table H-1 : Definitions and requirements for the high temperature range used in this Standard	63

Foreword

This document (EN 16603-31:2014) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16603-31:2014) originates from ECSS-E-ST-31C.

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 supersedes EN 14607-1:2004.

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

ECSS-E-ST-31 defines requirements for the discipline of thermal engineering.

This Standard defines the requirements for the definition, analysis, design, manufacture, verification and in-service operation of thermal control subsystems of spacecraft and other space products.

For this Standard, the complete temperature scale is divided into three ranges:

- Cryogenic temperature range
- Conventional temperature range
- High temperature range.

The requirements of this Standard are applicable to the complete temperature scale. However, where applicable, requirements are stated to be applicable only for the cryogenic or high temperature range. References to these specific requirements have been summarized in Annex G and Annex H.

This standard is applicable to all flight hardware of space projects, including spacecraft and launchers.

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 16603-10-04	ECSS-E-ST-10-04	Space engineering – Space environment
EN 16601-40	ECSS-M-ST-40	Space project management – Configuration and information management
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 16602-70-01	ECSS-Q-ST-70-01	Space product assurance – Cleanliness and contamination control

koniec náhľadu – text ďalej pokračuje v platenej verzii STN