

STN	Zabezpečovanie výrobkov kozmického programu. Skladovanie, manipulácia a preprava konštrukčných častí kozmických zariadení.	STN EN 16602-20-08
		31 0542

Space product assurance - Storage, handling and transportation of spacecraft hardware

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. 02/17

Obsahuje: EN 16602-20-08:2016

124294

Úrad pre normalizáciu, metrológiu a skúšobníctvo SR, 2017
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.

EUROPEAN STANDARD

EN 16602-20-08

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 2016

ICS 49.140

English version

Space product assurance - Storage, handling and transportation of spacecraft hardware

Assurance produit des projets spatiaux - Stockage,
manipulation et transport du matériel d'un véhicule
spatial

Raumfahrtproduktsicherung - Lagerung, Handhabung
und Transport von Raumfahrzeug-Hardware

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.



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

Table of contents

European Foreword.....	5
Introduction.....	6
1 Scope.....	7
2 Normative references.....	8
3 Terms, definitions and abbreviated terms.....	9
3.1 Terms from other standards.....	9
3.2 Terms specific to the present standard	9
3.3 Abbreviated terms.....	10
3.4 Nomenclature	10
3.4.1 Formal verbs	10
4 General requirements for storage, handling and transportation	12
4.1 Project phasing.....	12
4.2 Design considerations	12
4.3 Nonconformance management.....	13
4.4 Safety	13
4.5 Environmental conditions.....	13
4.6 Packaging and protection material.....	13
4.7 Certified equipment.....	14
4.8 Training	14
5 Storage	15
5.1 General.....	15
5.2 Storage implementation.....	15
5.3 Document requirements.....	15
5.4 Configuration	16
5.4.1 Storage technical configuration	16
5.4.2 Duration	17
5.4.3 Environmental conditions	17
5.5 Storage activities	17
5.5.1 Pre-storage review (PSR)	17

5.5.2	Storage area	17
5.5.3	Traceability	18
5.5.4	Packing and unpacking activities.....	18
5.5.5	Periodic inspection and testing.....	18
5.5.6	Refurbishment and maintenance.....	18
5.5.7	Associated hardware.....	19
5.5.8	Software.....	19
5.5.9	Post storage activities	19
5.6	Retesting after re-assembly	19
5.7	Product knowledge conservation	19
6	Handling	20
6.1	Background	20
6.2	Handling MGSE requirements	20
6.2.1	Easy visual inspection.....	20
6.2.2	Hazardous or unsafe configuration.....	20
6.2.3	MGSE reuse	20
6.2.4	MGSE loose items	21
6.2.5	Ready for use criteria	21
6.2.6	MGSE logbook.....	21
6.2.7	MGSE maintenance plan	21
6.2.8	MGSE validation	22
6.3	Operational requirements	22
6.3.1	Dedicated procedure.....	22
6.3.2	Operation prerequisite.....	22
6.3.3	Attachment points inspection	23
6.3.4	Non-interruptible sequence operation	23
6.4	Quality requirements.....	23
6.4.1	QA witnesses	23
7	Transportation	24
7.1	Categories of transported goods.....	24
7.1.1	General.....	24
7.1.2	P1 products.....	24
7.1.3	P2 products.....	24
7.1.4	P3 products.....	25
7.2	Categorization of transports.....	25
7.2.1	Overview.....	25
7.2.2	Category of transports to be used	25

EN 16602-20-08:2016 (E)

7.3	Transport general requirements.....	26
7.4	FMEA and risk analysis	27
7.5	Consent to transport (CTT).....	27
7.6	Escort role and responsibilities	28
7.6.1	Escort scope and applicability	28
7.6.2	Duty of the escort.....	28
7.7	Loading.....	29
7.7.1	Background.....	29
7.7.2	Requirements.....	29
7.8	Packaging requirements	30
7.8.1	General packaging requirements	30
7.8.2	Markings requirements.....	31
7.9	Transport requirements summary	32
Annex A (normative) Storage plan (SP) DRD	33	
A.1	DRD identification	33
A.1.1	Requirement identification and source document.....	33
A.1.2	Purpose and objective.....	33
A.2	Expected response	33
A.2.1	Scope and content	33
A.2.2	Special remarks	35
Annex B (informative) Example of a “Movement Plan”.....	36	
Annex C (informative) Example of a "Consent to transport".....	38	
Annex D (informative) Example of a "Packing, shipping, transportation and delivery checklist"	48	
Annex E (informative) Deliverable per Review List	50	
Bibliography.....	51	
Figures		
Figure B-1 : Example of Movement Plan	37	
Figure D-1 : Packing, shipping, transportation and delivery checklist.....	49	
Tables		
Table 7-1: Summary of transport requirements	32	
Table E-1 : Storage Plan with respected to milestones.....	50	

European Foreword

This document (EN 16602-20-08:2016) has been prepared by Technical Committee CEN-CENELEC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16602-20-08:2016) originates from ECSS-Q-ST-20-08C.

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 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

This standard focuses on requirements for preservation of space segments and associated hardware.

1**Scope**

The standard specifies requirements to ensure safe handling, storage, transportation of space segment hardware, including associated items to avoid degradation from integration up to launch.

The standard is applicable to: Space systems, Space segments, Assembled Spacecraft, Space segment elements, Spacecraft Modules, space segment subsystems, space segment equipment, partly manufactured space segment equipment. Intended programs are all space programs and target users all space hardware suppliers and customers.

The standard does not cover obsolescence management issues.

This standard may be tailored for the specific characteristic and constraints of a space project in conformance with ECSS-S-ST-00.

NOTE This standard is applicable to GSE, when mentioned in the different clauses of this standard.

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	ECSS-E-ST-10	Space engineering - System engineering general requirements
EN 16603-10-03	ECSS-E-ST-10-03	Space engineering - Testing
EN 16601-40	ECSS-M-ST-40	Space project management- Configuration and information management
EN 16601-80	ECSS-M-ST-80	Space project management - Risk management
EN 16602-10	ECSS-Q-ST-10	Space product assurance - Product assurance management
EN 16602-10-04	ECSS-Q-ST-10-04	Space product assurance - Critical item control
EN 16602-10-09	ECSS-Q-ST-10-09	Space product assurance - Nonconformance control system
EN 16602-20	ECSS-Q-ST-20	Space product assurance - Quality assurance
EN 16602-30-02	ECSS-Q-ST-30-02	Space product assurance - Failure modes effects (and criticality) analysis
EN 16602-40	ECSS-Q-ST-40	Space product assurance - Safety

koniec náhľadu – text d'alej pokračuje v platenej verzii STN