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**Raumfahrtproduktsicherung –
Nutzung von off-the-shelf Produkten in Raumfahrtsystemen;
Englische Fassung EN 16602-20-10:2014**

Space product assurance –
Off-the-shelf items utilization in space systems;
English version EN 16602-20-10:2014

Assurance produit des projets spatiaux –
Utilisation d'éléments sur étagères dans les systèmes spatiaux;
Version anglaise EN 16602-20-10:2014

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Nationales Vorwort

Dieses Dokument (EN 16602-20-10:2014) wurde vom Technischen Komitee CEN/CLC/TC 5 „Raumfahrt“ erarbeitet, dessen Sekretariat vom DIN (Deutschland) gehalten wird.

Das zuständige deutsche Normungsgremium ist der Arbeitsausschuss NA 131-10-01 AA „Interoperabilität von Informations-, Kommunikations- und Navigationssystemen“ im DIN-Normenausschuss Luft- und Raumfahrt (NL).

Dieses Dokument (EN 16602-20-10:2014) basiert auf ECSS-Q-ST-20-10C.

Dieses Dokument enthält unter Berücksichtigung des DIN-Präsidialbeschlusses 1/2004 nur die englische Originalfassung von EN 16602-20-10:2014.

Dieses Dokument wurde speziell zur Behandlung von Raumfahrtsystemen erarbeitet und hat daher Vorrang vor jeglicher Europäischer Norm, da es denselben Anwendungsbereich hat, jedoch über einen größeren Geltungsbereich (z. B. Luft- und Raumfahrt) verfügt.

Nationaler Anhang NA (informativ)

Begriffe und Abkürzungen

3 Begriffe und Abkürzungen

3.1 Begriffe aus anderen Normen

Für die Anwendung dieses Dokuments gelten die Begriffe und Definitionen nach ECSS-S-ST-00-01.

3.2 Für diese Norm spezifische Begriffe

3.2.1

Hersteller

Industrieller, der das kommerzielle Standardprodukt entwickelt und produziert hat und auf dem Markt bereitstellt

3.3 Abkürzungen

Für die Anwendung dieser Norm gelten die Abkürzungen nach ECSS-S-ST-00-01 und die folgenden Abkürzungen.

Abkürzung	Bedeutung	
CIDL	Konfigurationseinheits-Datenliste	(en: configuration item data list)
CoC	Konformitätszertifikat	(en: certificate of conformance)
DML	deklarierte Material-Liste	(en: declared material list)
DPL	deklarierte Prozess-Liste	(en: declared process list)
DRD	Dokumenten-Anforderungsdefinition	(en: document requirements definition)
EEE	elektronisch, elektrisch, elektromechanisch	(en: electronic, electrical, electromechanical)
EMC	elektromagnetische Verträglichkeit	(en: electromagnetic compatibility)
EMI	elektromagnetische Störung	(en: electromagnetic interference)
ESD	elektrostatische Entladung	(en: electrostatic discharge)
EQSR	Review zum Qualifikationsstatus der Geräte	(en: equipment qualification status review)
FMEA	Analyse der Auswirkungen der Versagensarten	(en: failure modes effects analysis)
FMECA	Fehlerart-, auswirkungs- und -kritizitätsanalyse	(en: failure modes effects and criticality analysis)
ISO	Internationale Organisation für Normung	(en: International Organization for Standardization)
ITAR	Vorschriften über den internationalen Handel mit Waffen	(en: International Traffic in Arms Regulation)
LCC	Lebenszykluskosten	(en: life cycle cost)

Abkürzung	Bedeutung	
LET	lineares Energieübertragungsvermögen	(en: linear energy transfer)
LU	Latch-up-Effekt Einrasten	(en: latch up)
MTTF	Mittlere Dauer bis zum Ausfall	(en: mean time to failure)
NIEL	nichtionisierender Energieverlust	(en: non-ionising energy loss)
OTS	handelsüblich	(en: off-the-shelf)
PAD	Teilezulassungsdokument	(en: part approval documents)
PDR	vorläufiges Design-Review	(en: preliminary design review)
PCB	Leiterplatte, gedruckte Schaltung	(en: printed circuit board)
QSL	Liste zum Qualifikationsstatus	(en: qualification status list)
RAM	Funktionsfähigkeit, Verfügbarkeit, Instandhaltbarkeit	(en: reliability, availability, maintainability)
RFD	Abweichungsantrag	(en: request for deviation)
RFW	Antrag auf Sonderfreigabe (nach Realisierung)	(en: request for waiver)
SEE	Einzelereignis-Effekt	(en: single level effect)
SEU	Einzelereignis-Upset	(en: single event upset)
SRR	Systemanforderungs-Review	(en: system requirements review)
STD	Norm	(en: standard)
TID	Gesamtdosis ionisierender Strahlung	(en: total ionising dose)
VCD	Verifikationskontroll-Dokument	(en: verification control document)

English version

Space product assurance - Off-the-shelf items utilization in space systems

Assurance produit des projets spatiaux - Utilisation d'éléments sur étagères dans les systèmes spatiaux

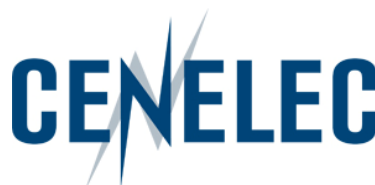
Raumfahrtproduktsicherung - Nutzung von off-the-shelf Produkten in Raumfahrtsystemen

This European Standard was approved by CEN on 6 March 2014.

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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.

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Foreword

This document (EN 16602-20-10:2014) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16602-20-10:2014) originates from ECSS-Q-ST-20-10C.

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 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.

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Scope

This Standard applies to all parties involved at all levels in the utilization of OTS items into space segment hardware and launchers.

For the purpose of this Standard, Off-the-Shelf (OTS) Items are those that, even if not necessarily developed for space applications, can be procured from the market and utilized in a space system.

This Standard contains the requirements for the utilization of OTS Items, in terms of their selection, characterization and procurement for space system use.

This Standard considers complex OTS items, as for example: motherboards, cards, data storage units/items, optical equipments, photo cameras and video units, LANs, mechanical/electrical and electromechanical devices, batteries, sensors, monitoring support units, medical equipments and items, laptops.

This Standard does not cover:

- software OTS,
- re-use of OTS items already qualified for space applications,

NOTE However, items not belonging to the same lot of the OTS item already evaluated using this standard, can be subjected to partial re-evaluation and re-qualification since, on the commercial market, fast evolution of the design occurs.

- Pieces, parts and materials, such as electrical, electronic and electromechanical (EEE) parts, thermocouples, rivets, fasteners, connectors, fittings, adhesives, insulation, wiring and plumbing.

This standard is not specifically addressing the re-use of OTS items for the same space application for which they were initially qualified.

This standard may be tailored for the specific characteristic 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 16603-10	ECSS-E-ST-10	Space engineering - System engineering general requirements
EN 16603-10-02	ECSS-E-ST-10-02	Space engineering - Verification
EN 16603-10-12	ECSS-E-ST-10-12	Space engineering - Methods for the calculation of radiation received and its effects, and a policy for design margins
EN 16603-20	ECSS-E-ST-20	Space engineering - Electrical and electronic
EN 16603-31	ECSS-E-ST-31	Space engineering - Thermal control general requirements
EN 16603-32	ECSS-E-ST-32	Space engineering - Structural general requirements
EN 16603-50-05	ECSS-E-ST-50-05	Space engineering - Radio frequency and modulation
EN 16603-50-14	ECSS-E-ST-50-14	Space engineering - Spacecraft discrete interfaces
EN 16602-20	ECSS-Q-ST-20	Space product assurance - Quality assurance
EN 16602-60	ECSS-Q-ST-60	Space product assurance - Electrical, electronic and electromechanical (EEE) components
EN 16602-70	ECSS-Q-ST-70	Space product assurance - Materials, mechanical parts and processes
EN 16602-70-28	ECSS-Q-ST-70-28	Space product assurance - Repair and modification of printed circuit board assemblies for space use

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 manufacturer

industrial subject that has developed and produced the OTS item and makes it available on the market

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
CIDL	configuration item data list
CoC	certificate of conformance
DML	declared material list
DPL	declared process list
DRD	document requirements definition
EEE	electronic, electrical, electromechanical
EMC	electromagnetic compatibility
EMI	electromagnetic interference
ESD	electrostatic discharge
EQSR	equipment qualification status review
FMEA	failure modes effects analysis
FMECA	failure modes effects and criticality analysis
ISO	International Organization for Standardization

Abbreviation	Meaning
ITAR	International Traffic in Arms Regulation
LCC	life cycle cost
LET	linear energy transfer
LU	latch up
MTTF	mean time to failure
NIEL	non-ionising energy loss
OTS	off-the-shelf
PAD	part approval documents
PDR	preliminary design review
PCB	printed circuit board
QSL	qualification status list
RAM	reliability, availability, maintainability
RFD	request for deviation
RFW	request for waiver
SEE	single level effect
SEU	single event upset
SRR	system requirements review
STD	standard
TID	total ionising dose
VCD	verification control document