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Space engineering — Explosive subsystems and devices

Raumfahrttechnik — Explosive Subsysteme und Geräte

Ingénierie spatiale — Sous-systèmes et dispositifs explosifs

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National Foreword

For the present ÖNORM EN no German translation is envisaged.

Therefore, the English version has been implemented in Austria and made available to all users of the standard.

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English version

Space engineering - Explosive subsystems and devices

Ingénierie spatiale - Sous-systèmes et dispositifs explosifs

Raumfahrttechnik - Explosive Subsysteme und Geräte

This European Standard was approved by CEN on 28 September 2018.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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European Foreword

This document (EN 16603-33-11:2019) has been prepared by Technical Committee CEN-CENELEC/TC 5 “Space”, the secretariat of which is held by DIN.

This standard (EN 16603-33-11:2019) originates from ECSS-E-ST-33-11C 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of an identical text or by endorsement, at the latest by October 2019, and conflicting national standards shall be withdrawn at the latest by October 2019.

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 14607-6:2004.

Changes to EN 14607-6:2004 that was based on ECSS-E-30 Part 6A (25 April 2000) are:

- Complete edit to conform to the ECSS Drafting Rules for "ECSS Issue C standards"
- Implementation of ECSS Change Requests and harmonization the standard with ISO in ECSS Revision 1 (2017)
- Change of the title from "Space engineering - Mechanical - Part 6: Pryotechnics" to "Space engineering – Explosive subsystems and devices"
- Use of the more accurate term "explosive" rather than "pyrotechnics" in relation to the subject components and systems
- Emphasis on reliability coupled with confidence level for performance properties
- Inclusion of detailed requirements for the different types of explosive device
- Emphasis on the requirement for properties of components to be agreed with the end user before commitment to purchase.

This document has been prepared under a standardization request 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

As any explosive item used for flight can function only once, it can never be fully tested before its crucial mission operation. The required confidence can only be established indirectly by the testing of identical items. Test results and theoretical justification are essential for demonstration of fulfilment of the requirements. The requirement for repeatability shows that product assurance plays a crucial role in support of technical aspects.

The need for statistics requires that the explosive components used in the explosive subsystem be tested and characterized extensively. The variability in components requires that manufacturers prove to customers that delivered items are identical to those qualified.

The failure or unintentional operation of an explosive item can be catastrophic for the whole mission and life threatening. Specific requirements can exist for the items associated with it. As all explosives where ever used are treated similarly, the same requirements, regulations, practices and standards need to be applied to help avoiding human error.

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Scope

This Standard defines the requirements for the use of explosives on all spacecraft and other space products including launch vehicles. It addresses the aspects of design, analysis, verification, manufacturing, operations and safety.

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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