

DIN EN 16602-70-36

ICS 49.140; 49.025.01

Einsprüche bis 2014-05-28
Vorgesehen als Ersatz für
DIN EN 14101:2002-10**Entwurf****Raumfahrtproduktsicherung –
Kriterien für die Werkstoffwahl zur Vermeidung von
Spannungsrissskorrosion;
Englische Fassung FprEN 16602-70-36:2013**Space product assurance –
Material selection for controlling stress-corrosion cracking;
English version FprEN 16602-70-36:2013Assurance produit des projets spatiaux –
Sélection des matériaux en vue d'éviter leur fissuration par corrosion sous contrainte;
Version anglaise FprEN 16602-70-36:2013**Anwendungswarnvermerk**

Dieser Norm-Entwurf mit Erscheinungsdatum 2014-03-28 wird der Öffentlichkeit zur Prüfung und
Stellungnahme vorgelegt.

Weil die beabsichtigte Norm von der vorliegenden Fassung abweichen kann, ist die Anwendung dieses
Entwurfes besonders zu vereinbaren.

Stellungnahmen werden erbeten

- vorzugsweise online im Norm-Entwurfs-Portal des DIN unter www.entwuerfe.din.de bzw. für Norm-Entwürfe der DKE auch im Norm-Entwurfs-Portal der DKE unter www.entwuerfe.normenbibliothek.de, sofern dort wiedergegeben;
- oder als Datei per E-Mail an nl@din.de möglichst in Form einer Tabelle. Die Vorlage dieser Tabelle kann im Internet unter www.din.de/stellungnahme oder für Stellungnahmen zu Norm-Entwürfen der DKE unter www.dke.de/stellungnahme abgerufen werden;
- oder in Papierform an den Normenausschuss Luft- und Raumfahrt (NL) im DIN, 10772 Berlin (Hausanschrift: Burggrafenstr. 6, 10787 Berlin).

Die Empfänger dieses Norm-Entwurfs werden gebeten, mit ihren Kommentaren jegliche relevanten
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Gesamtumfang 43 Seiten

Normenausschuss Luft- und Raumfahrt (NL) im DIN

Nationales Vorwort

Dieses Dokument (FprEN 16602-70-36:2013) wurde vom Technischen Komitee CEN/CLC/TC 5 „Raumfahrt“ erarbeitet, dessen Sekretariat vom DIN (Deutschland) gehalten wird.

Dieses Dokument ist derzeit zum einstufigen Annahmeverfahren vorgelegt.

Dieses Dokument wird DIN EN 14101:2002-10 ersetzen.

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.

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).

Änderungen

Gegenüber DIN EN 14101:2002-10 wurden folgende Änderungen vorgenommen:

- a) Norm-Nummer geändert;
- b) keinerlei Änderungen des Textes.

Nationaler Anhang NA (informativ)

Begriffe

3 Begriffe und Abkürzungen

3.1 Begriffe aus anderen Normen

Für die Anwendung dieses Dokuments gelten die Begriffe nach ECSS-S-ST-00-01 und ECSS-Q-ST-70.

3.2 Für diese Norm spezifische Begriffe

3.2.1

Spannungskorrosion

kombinierte Wirkung aus anhaltender Zugspannung und Korrosion, die zu einem vorzeitigen Versagen der Werkstoffe führen kann

3.3 Abkürzungen

Für die Anwendung dieses Dokuments gelten die Abkürzungen in ECSS-S-ST-00-01 und die folgenden Abkürzungen:

Abkürzung	Bedeutung
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SCC	Spannungsrissskorrosion (en: stress-corrosion cracking)
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SCEF	Bewertungsformular für Spannungskorrosion (en: stress-corrosion evaluation form)
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— Leerseite —

October 2013

ICS 49.025.01; 49.140

Will supersede EN 14101:2001

English version

Space product assurance - Material selection for controlling stress-corrosion cracking

Assurance produit des projets spatiaux - Sélection des matériaux en vue d'éviter leur fissuration par corrosion sous contrainte

Raumfahrtproduktsicherung - Kriterien für die Werkstoffwahl zur Vermeidung von Spannungsrissskorrosion

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/CLC/TC 5.

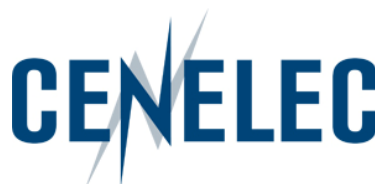
If this draft becomes a European Standard, CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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Foreword

This document (FprEN 16602-70-36:2013) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN (Germany).

This document (FprEN 16602-70-36:2013) originates from ECSS-Q-ST-70-36C.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 14101:2001.

This document has been developed to cover specifically space systems and will therefore have precedence over any EN covering the same scope but with a wider domain of applicability (e.g. : aerospace).

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Scope

This Standard covers the following processes of the general materials, mechanicals parts and processes (MMPP) flow of ECSS-Q-ST-70:

- The selection of metal alloys for which preference is given to approved data sources (Table 5-1 to Table 5-3)
- The criticality analysis to determine if a stress corrosion cracking (SCC) evaluation is necessary

This Standard sets forth the criteria to be used in the selection of materials for spacecraft and associated equipment and facilities so that failure resulting from stress-corrosion is prevented.

It is intended to provide general criteria to be used in stress-corrosion cracking control, which begins during design thanks to a methodological material selection.

This document does not intend to include all factors and criteria necessary for the total control of stress-corrosion cracking in all alloys.

The criteria established in this Standard are only applicable to designs for service involving exposure conditions similar to testing conditions

As regards weldments, this Standard is applicable to aluminium alloys, selected stainless steels in the 300 series and alloys listed in Table 5-1.

This Standard is not applicable to listed materials whose behaviour differs at elevated temperature and in specific chemical.

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 16602-70	ECSS-Q-ST-70	Space product assurance - Materials, mechanical parts and processes.
EN 16602-70-37	ECSS-Q-ST-70-37	Space product assurance - Determination of the susceptibility of metals to stress-corrosion cracking.
	NASA-MSFC-SPEC 522B (July 1987)	Design criteria for controlling stress-corrosion cracking

Terms, definitions and abbreviated terms

3.1 Terms from other standards

For the purpose of this Standard, the terms and definitions from ECSS-ST-00-01 and ECSS-Q-ST-70 apply.

3.2 Terms specific to the present standard

3.2.1 stress-corrosion

combined action of sustained tensile stress and corrosion that can lead to the premature failure of materials

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
SCC	stress-corrosion cracking
SCEF	stress-corrosion evaluation form

4

Principles

4.1 Stress corrosion

Certain materials are more susceptible to stress corrosion cracking (SCC) than others. If a susceptible material is placed in service in a corrosive environment under tension of sufficient magnitude, and the duration of service is sufficient to permit the initiation and growth of cracks, failure occurs at a stress lower than that which the material is normally be expected to withstand. The corrosive environment need not be severe in terms of general corrosive attack.

NOTE Service failures due to stress-corrosion are frequently encountered in cases where the surfaces of the failed parts are not visibly corroded in a general sense.

Moreover, stresses are additive and threshold stresses for susceptibility are often low. There have been a number of stress-corrosion failures for which design stresses were intermittent and of short duration, and only of minor significance in contributing to failure. Stress-corrosion cracking in those cases occurred because of a combination of residual and assembly stresses not anticipated in design.

4.2 Evaluation of metal alloys

Resistance to stress- corrosion cracking of metal alloys depends mainly on factors:

- Grain orientation (see Annex D)
- Susceptibility to SCC (see Annex E)