SLOVENSKI STANDARD
oSIST prEN 4869-001:2023

01-maj-2023

Aeronavtika - Razširjeni optični zaključki, nefizični stik optičnih vlaken v standardnih votlinah po standardu EN 3645 - 001. del: Tehnična specifikacija

Aerospace series - Expanded beam termini, fibre optic non-physical contact in EN 3645 standard cavities - Part 001: Technical specification

Luft- und Raumfahrt - Strahlaufweitender Anschluss, berührungsloser Lichtwellenleiterkontakt in EN 3645-Standardkontaktkammern - Teil 001: Technische Lieferbedingungen

Série aérospatiale - Contact à faisceau expansé, fibre optique sans contact physique dans alvéoles standards EN 3645 - Partie 001 : Spécification technique

Ta slovenski standard je istoveten z: **prEN 4869-001**

ICS:

49.090	Oprema in instrumenti v zračnih in vesoljskih plovilih	On-board equipment and instruments

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EUROPEAN STANDARD

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, CEN 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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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Contents

Page

European foreword

This document (prEN 4869-001:2023) has been prepared by the Aerospace and Defence Industries Association of Europe — Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this document has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This document is currently submitted to the CEN Enquiry.

Introduction

The family of connectors used on this standard are in accordance with EN 3645-001. The optical termini, which are using the expanded beam technology, are specially adapted to the cavities of this kind of connectors. It is particularly suitable for use in zones of severe environmental conditions on board aircraft, applying EN 2282.

1 Scope

This document specifies the general characteristics, the conditions for qualification, acceptance and quality assurance, as well as the test programs and groups for threaded ring coupling circular connectors with expanded beam termini, intended for use in a temperature range from −55 °C to 125 °C continuous.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2591-100, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 100: General*

EN 2591-101, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 101: Visual examination*

EN 2591-102, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 102: Examination of dimensions and mass*

EN 2591-302, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 302: Climatic sequence*

EN 2591-304, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 304: Damp heat steady state*

EN 2591-308, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 308: Sand and dust*

EN 2591-311, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 311: Low air pressure*

EN 2591-312, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 312: Air leakage*

EN 2591-315, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 315: Fluid resistance*

EN 2591-403, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 403: Sinusoidal and random vibration*

EN 2591-407, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 407: Durability of contact retention system and seals*

EN 2591-408, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 408: Mating and unmating forces*

EN 2591-409, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 409: Contact retention in insert*

EN 2591-410, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 410: Insert retention in housing (axial)*

EN 2591-412, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 412: Contact insertion and extraction forces*

EN 2591-413, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 413: Holding force of grounding spring system*

EN 2591-426, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 426: Contact retention system effectiveness*

EN 2591-506, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 506: Use of tools*

EN 2591-601, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 601: Optical elements — Insertion loss*

EN 2591-602, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 602: Optical elements — Variation of attenuation and optical discontinuity*

EN 2591-604, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 604: Optical elements — Cleaning capability of optical face*

EN 2591-605, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 605: Optical elements — Return loss*

EN 2591-607, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 607: Optical elements — Immunity to ambient light coupling*

EN 2591-608,[1] *Aerospace series — Elements of electrical and optical connection — Test methods — Part 608: Optical elements — Nuclear radiation*

EN 2591-609, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 609: Optical elements — Effectiveness of cable attachment — Cable cyclic flexing*

EN 2591-610, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 610: Optical elements — Effectiveness of cable attachment — Cable pulling*

EN 2591-611, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 611: Optical elements — Effectiveness of cable attachment — Cable torsion*

EN 2591-612, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 612: Optical elements — Effectiveness of cable attachment — Cable axial compression*

EN 2591-613, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 613: Optical elements — Impact test*

EN 2591-615, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 615: Optical elements — Connection integrity at temperature*

EN 2591-617, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 617: Optical elements — Temperature cycling*

[1] This project of document has been abandoned and is not published.

EN 2591-6101, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6101: Optical elements — Visual examination*

EN 2591-6301, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6301: Optical elements — Endurance at temperature*

EN 2591-6303, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6303: Optical elements — Cold/low pressure and damp heat*

EN 2591-6305, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6305: Optical elements — Rapid change of temperature*

EN 2591-6307, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6307: Optical elements — Salt mist*

EN 2591-6314, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6314: Optical elements — Immersion at low air pressure*

EN 2591-6316, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6316: Optical elements — Ozone resistance*

EN 2591-6317, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6317: Optical elements — Flammability*

EN 2591-6321, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6321: Optical elements — Damp heat, cyclic test*

EN 2591-6402, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6402: Optical elements — Shock*

EN 2591-6403, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6403: Optical elements — Vibrations*

EN 2591-6404, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6404: Optical elements — Transverse load*

EN 2591-6405, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6405: Optical elements — Axial load*

EN 2591-6406, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6406: Optical elements — Mechanical endurance*

EN 2591-6414, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 6414: Optical elements — Unmating of lanyard release optical connection elements*

EN 3155-008, *Aerospace series — Electrical contacts used in elements of connection — Part 008: Contacts, electrical, male, type A, crimp, class S — Product standard*

EN 3155-009, *Aerospace series — Electrical contacts used in elements of connection — Part 009: Contacts, electrical, female, type A, crimp, class S — Product standard*

EN 3197,[2] *Aerospace series — Design and installation of aircraft electrical and optical interconnection systems*

EN 3645-001, *Aerospace series — Connectors, electrical, circular, scoop-proof, triple start threaded coupling, operating temperature 175 °C or 200 °C continuous — Part 001: Technical specification*

EN 3645-002, *Aerospace series — Connectors, electrical, circular, scoop-proof, triple start threaded coupling, operating temperature 175 °C or 200 °C continuous — Part 002: Specification of performance and contact arrangements*

EN 3909, *Aerospace series — Test fluids and test methods for electrical and optical components and sub-assemblies*

EN 4869-101,[3] *Aerospace series — Expanded beam termini, fibre optic non-physical contact in EN 3645 standard cavities — Part 101: Multimode male termini size 16 technical specification*

EN 4869-102,[3] *Aerospace series — Expanded beam termini, fibre optic non-physical contact in EN 3645 standard cavities — Part 102: Multimode female termini size 16 technical specification*

EN 4869-103,[3] *Aerospace series — Expanded beam termini, fibre optic non-physical contact in EN 3645 standard cavities — Part 103: multimode male termini size 12 technical specification*

EN 4869-104,[3] *Aerospace series — Expanded beam termini, fibre optic non-physical contact in EN 3645 standard cavities — Part 104: Multimode female termini size 12 technical specification*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard products*

ISO 68-1,[4] *ISO general purpose screw threads — Basic profile — Part 1: Metric screw threads*

ISO 4524-1,[4] *Metallic coatings — Test methods for electrodeposited gold and gold alloy coatings — Part 1: Determination of coating thickness*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 2591-100 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

[2] Published as ASD-STAN Standard at the date of publication of this document by AeroSpace and Defence industries Association of Europe — Standardization (ASD-STAN), https://www.asd-stan.org/.

[3] In preparation at the date of publication of this document.

[4] Published by: ISO International Organization for Standardization http://www.iso.ch/.

4 Description

4.1 General

General description as specified in EN 3645-001.

4.2 Receptacle

Receptacle description as specified in EN 3645-001.

4.3 Plug

Plug description as specified in EN 3645-001.

4.4 Materials and surface treatment

4.4.1 General

When dissimilar metals are in close contact, adequate protection against corrosion shall be used for the electromotive force of the cell not to exceed 0,25 V (see EN 3197).

4.4.2 Housing

The material of the housings for the connectors and fittings may be either aluminium alloy, passivated stainless steel or composite. Aluminium alloy and composite shall be plated as defined by the class (composite coupling rings and Hex nut may be unplated) (see EN 3645-002).

4.4.3 Contacts

Unless otherwise specified, the non-removable electrical contacts shall be in copper alloy.

They shall be gold-plated on an appropriate undercoat. Selective protection is authorized provided that it is sufficient to ensure that the specified performance is achieved.

Measurement of the thickness of the protective plating shall be effected in accordance with ISO 4524-1.

For removable electrical contacts, see EN 3645-002.

For optical contacts, see EN 4869-101, EN 4869-102, EN 4869-103 and EN 4869-104.

4.4.4 Non-metallic materials

The materials used for inserts, seals and grommets shall have a hardness and mechanical and electrical characteristics consistent with the required use.

5 Design

5.1 Housings

Housing description as specified in EN 3645-001.

5.2 Inserts

Inserts description as specified in EN 3645-001.

6 Definition drawings and masses

6.1 General

The general dimensions and the masses of receptacles, plugs and protective covers are given in the product standards.

6.2 Receptacle mating dimensions

Refer to EN 3645-001.

The mating dimensions for lensed contact are the same as for the electrical contact.

6.3 Plug mating dimensions

Refer to EN 3645-001.

The mating dimensions for lensed contact are the same as for the electrical contact.

6.4 Receptacle and plug polarization

Refer to EN 3645-001.

6.5 Dimensions of the rear part of the connectors

6.5.1 Accessory interface dimensions

Refer to EN 3645-001.

6.5.2 Size 8 cavity – rear dimensions

Refer to EN 3645-001

6.5.3 Size 12 cavity – Piggyback boot style

The piggyback boot style can be used to reinforce sealing (altitude immersion) on the rear of a connector with EN 4869-103 and EN 4869-104 termini.

See details of the piggyback boot style on Figure 1.