BS EN 4830-001:2015

BSI Standards Publication

Aerospace series — Connectors, optical, rectangular, modular, operating temperature 125 °C, for EN 4639-10X contacts

Part 001: Technical specification

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National foreword

This British Standard is the UK implementation of EN 4830-001:2015.

The UK participation in its preparation was entrusted to Technical Committee ACE/6, Aerospace avionic electrical and fibre optic technology.

A list of organizations represented on this committee can be obtained on request to its secretary.

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European foreword

This document (EN 4830-001:2015) 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 European Standard 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 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of an identical text or by endorsement, at the latest by June 2016, and conflicting national standards shall be withdrawn at the latest by June 2016.

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Introduction

This family of fibre optic connectors is derived from EN 4165-001 with EN 4639-10X optical contacts. It is suitable for use on aerospace on board applications. It provides easy access for optical contact end face cleaning.

1 Scope

This European Standard specifies the general characteristics, the conditions for qualification, acceptance and quality assurance, as well as the test programs and groups for EN 4165 rectangular connectors with removable optical modules using EN 4639-10X contacts.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2591 (all parts), *Aerospace series — Elements of electrical and optical connection — Test methods*

EN 3909, *Aerospace series — Test fluids for electric components and sub-assemblies*

EN 4165 (all parts), *Aerospace series — Connectors, electrical, rectangular, modular — Operating temperature 175 °C continuous*

EN 4529 (all parts), *Aerospace series — Elements of electrical and optical connection — Sealing plugs*

EN 4639 (all parts), *Aerospace series — Connectors, optical, circular, single and multipin, coupled by threaded ring — Flush contacts*

EN 4830-002, *Aerospace series — Connectors, optical, rectangular, modular, operating temperature 125 °C, for EN 4639-10X contacts — Part 002: Specification of performance*

EN 4830-003, *Aerospace series — Connectors, optical, rectangular, modular, operating temperature 125 °C, for EN 4639-10X contacts — Part 003: Module — Product standard*

EN 4830-004, *Aerospace series — Connectors, optical, rectangular, modular, operating temperature 125 °C, for EN 4639-10X contacts — Part 004: Extraction tool — Product standard*

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

MIL-I-81969/14-03, *Installing and removal tools, connector electrical contact, type III, class 2, composition B* [1)]

TR 4684, *Aerospace series — Electrical and optical technology and component definitions* [2)]

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1) Published by; DoD National (US) Mil. Department of Defense. http://www.defenselink.mil/

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3 Terms and definitions

For the purposes of this document, the terms and definitions given in TR 4684 apply.

4 Description

4.1 General

This document describes an optical connector module to be installed in plug and receptacle housings.

Plug and receptacle housings conform to EN 4165-001.

The connectors use rear removable optical contacts with a ferrule diameter of 1,25 mm in accordance with EN 4639-10X.

The precise alignment of the optical contacts is accomplished by two alignment pin/socket and alignment sleeves.

The receptacles and plugs contain either male or female module.

The male module is characterised by alignment pins.

The female module is equipped with the removable alignment sleeve holder.

The inserts can be installed and removed from the shell by means of a tool as specified EN 4830-004.

Keying system conform to EN 4165-001.

Connector type designation as specified in EN 4165-001.

Not compatible with cable outlets and cable clamp defined in EN 4165-002.

4.2 Receptacle

Receptacle description as specified in EN 4165-001.

4.3 Plug

Plug description as specified in EN 4165-001.

4.4 Module

Mechanical interface and polarization between housings and modules conform to EN 4165-001.

The module assembly shall be single-bloc type design complete with a keyed contact retention system and appropriate seals.

The male and female modules use hermaphroditic contacts as specified in EN 4639-10X.

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2) In preparation at the date of publication of this European Standard.

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4.5 Materials and surface treatment

4.5.1 General

See EN 4165-001.

4.5.2 Housings

The connector housing description is specified in EN 4165-001.

4.5.3 Optical contacts and alignment sleeves

The contacts shall be of suitable materials as specified in the product standard EN 4639-002.

The optical alignment sleeves shall be of suitable materials as specified in the product standard EN 4830-002.

The optical contacts are spring-loaded. The spring force is defined in the product standard EN 4639.

4.5.4 Metallic or non-metallic materials

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

5 Design

5.1 Housing

The connector housing design is specified in EN 4165-001.

5.2 Modules

The modules carrying the optical contacts shall be in hard material and have a cross section and radii such that no cracks, flaking or breaks can occur in normal operation.

The module is mechanically held in the connector housing by retention clips, and removable with the use of an extraction tool.

The mechanical contacts retention system shall be integrated in the hard module.

The front face of the module shall be such that sealing is ensured when the connectors are coupled. The interfacial seal shall be permanently fastened on the male module and on the female module between the body of the module and the sleeve holder.

Sealing of the rear face of the module is provided by the grommet.

The design shall permit individual installation of the contacts without removal of the module.

Installation and removal of the contacts shall be from the rear. For ease of operation, tools as per MIL-I-81969/14-03 standard (P/N for size 16) may be used.

Contact identification shall be permanent and contrasted on the rear face of the insert.

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5.3 Connector mating sequence

5.3.1 Centre coupling mechanism

The mating sequence shall be:

— Face to face positioning;

— Keyways polarization guide;

— Plug – receptacle shell;

— Central thread coupling;

— Alignment pin engagement;

— Contact alignment;

— Optical physical contact;

— Sealed interface compression;

— Metal/metal or composite shell to shell bottoming.

5.3.2 Push-pull latching mechanism

The connector mating sequence should be as follows:

— Face to face positioning;

— Plug receptacle shell;

— Keyways polarization guide;

— Alignment pin engagement;

— Contact alignment;

— Optical physical contact;

— Locking mechanism alignment;

— Sealed interface compression maintaining;

— Locking mechanism engagement.

5.4 Connector mating

Housing design shall prevent incorrect mating of the plug onto receptacle.

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