PD IEC TR 62572-4:2020

BSI Standards Publication

Fibre optic active components and devices — Reliability standards

Part 4: Guidelines for optical connector end-face cleaning methods for receptacle style optical transceivers

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National foreword

This Published Document is the UK implementation of IEC TR 62572-4:2020. It supersedes PD IEC/TR 62572-4:2013, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/86/3, Fibre optic systems and active devices.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Fibre optic active components and devices – Reliability standards – Part 4: Guidelines for optical connector end-face cleaning methods for receptacle style optical transceivers

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – RELIABILITY STANDARDS –

Part 4: Guidelines for optical connector end-face cleaning methods for receptacle style optical transceivers

FOREWORD

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IEC TR 62572-4, which is a Technical Report, has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) addition of terms and definitions on multifibre connector interface optical transceivers;
b) addition of cleaning methods for multifibre connector interface type optical transceivers;

c) updating URLs for reference websites.

The text of this Technical Report is based on the following documents:

Draft TR	Report on voting
86C/1661/DTR	86C/1681/RVDTR

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62752 series, under the general title *Fibre optic active components and devices – Reliability standards*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

High speed internet communication systems and subscriber systems have spread rapidly owing to the increased capacity of data communication. In these systems, receptacle style optical transceivers such as SFP (small form factor pluggable) and XFP (10-Gbit/s small form factor pluggable), which can be mounted and removed during transmission systems operation, are widely used. Optical receptacles of optical transceivers are connected to optical connector plugs of optical patch cords, and optical signals are transmitted and received through these optical receptacles. Pluggable optical transceivers are typically of small size and low cost, and their designs are often simplified. Therefore, the internal structure, especially the receptacle structure, tends to vary between optical transceiver manufacturers.

Generally, to maintain high reliability of optical connections, the optical connector end-face needs to be cleaned. The Technical Report on cleaning of optical connector plugs and optical adaptors, IEC TR 62627-01 [1][1], proposed by Japan, was published in August 2010 and revised in January 2016.

There are, however, no standard cleaning methods for the optical receptacles of optical transceivers. It is a concern that the failure of optical transceivers due to damage and contamination of the optical receptacle end-face can lead to failure in optical network systems.

Multifibre connectors, like the multi-fibre push-on (MPO) connector – see IEC 61754-7 (all parts) [2] – have been widely used in data centres as fibre-to-fibre connections since the early 2010's. They are now also used as optical interfaces in optical transceivers, such as QSFP (quad small form factor pluggable) and CFP (C form factor pluggable) transceivers.

The physical structure of the optical interfaces in transceivers with MPO connectors is significantly different from that of transceivers with single fibre connectors, such as SC connectors (see IEC 61754-4 [3]) and LC connectors (see IEC 61754-20 [4]). Therefore, it was decided to revise this document by adding information on cleaning methods for MPO interface receptacle style optical transceivers.

IEC 62572-4:2013 was based on OITDA TP12/TP-2012, and this edition is based on OITDA TP12/AD-2019 [5].

[1] Numbers in square brackets refer to the Bibliography.

FIBRE OPTIC ACTIVE COMPONENTS AND DEVICES – RELIABILITY STANDARDS –

Part 4: Guidelines for optical connector end-face cleaning methods for receptacle style optical transceivers

1 Scope

This part of IEC 62572, which is a Technical Report, provides guidelines for optical connector end-face cleaning methods for receptacle style optical transceivers. It includes details about handling receptacle style optical transceivers, internal structures of optical transceivers, information on cleaning tools and machines, applicable cleaning methods, and cleaning procedures.

Receptacle style optical transceivers as well as optical fibre patch cords are handled by operators and maintenance staff of optical network systems. This document can be used as a guideline to prepare instruction manuals for the operators and maintenance staff of optical network systems.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
stub
polished short ferrule, including optical fibre inside, mounted in a receptacle style optical transceiver

Note 1 to entry: The stub is connected to an optical connector plug of an optical patch cord.

3.2
stub type optical transceiver
receptacle style optical transceiver with a stub

3.3
lens type optical transceiver
receptacle style optical transceiver without a stub, optically coupling an optical semiconductor device to an optical connector plug of an optical patch cord with converging optical beams by a lens or lenses