

TECHNICAL REPORT



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

IEC TR 62572-4:2013

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Part 4: Guidelines for optical connector end-face cleaning methods for
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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 active components and devices, of IEC technical committee 86: Fibre optics.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
86C/1147/DTR	86C/1182/RVC

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

A list of all parts in 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 publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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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), XFP (10-Gbps 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 type optical transceivers are required to be low cost and of small size, and the designs are often simplified. Therefore, the internal structure, especially the receptacle structure, tends to vary between optical transceiver manufacturers.

Generally, to maintain high reliability, optical connections require cleaning of the optical connector end-face. The technical report on cleaning of optical connector plugs and optical adaptors, IEC/TR 62627-01, which was proposed by Japan, was published in August, 2010.

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 may lead to failure in optical network systems.

This technical report is based on OITDA TP12/TP-2012.[1]¹

¹ References 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

IEC/TR 62572-4, 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 technical report may be used as a guideline to prepare instruction manuals for the operators and maintenance staff of optical network systems.

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.

IEC/TR 62627-01, *Fibre optic interconnecting devices and passive components – Part 01: Fibre optic connector cleaning methods*

<https://standards.itec.ai/en/standards/iec/625369c3-f3e3-4f38-871a-7af1510642a1/iec-tr-62572-4-2013>

IEC/TR 62627-05, *Fibre optic interconnecting devices and passive components – Part 05: Investigation on impact of contamination and scratches on optical performance of single mode (SM) and multimode (MM) connectors²*

3 Terms and definitions

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

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

² To be published.

3.3**lens type optical transceiver**

receptacle style optical transceiver without a stub, optically connecting an optical semiconductor device to an optical connector plug of an optical patch cord with converging optical beam by a lens (lenses)

3.4**plate contact type optical transceiver**

receptacle style optical transceiver without a stub connected by contacting a flat or convex plate (material of glass or plastic) to an end-face of an optical connector plug of an optical patch cord

3.5**optical transceiver**

optical module having both the functions of an optical transmitter and an optical receiver

3.6**reel type cleaner**

optical connector plug end-face cleaning tool, in which a cleaning cloth is rolled and is packed in a cassette box, and with a small window for cleaning

3.7**stick type cleaner**

optical connector receptacle and optical connector adaptor end-face cleaning tool in which a cleaning cloth is attached on top of a stick

Note 1 to entry: It is sometimes called a swab type cleaner.

3.8**pen type cleaner**

optical connector receptacle and optical connector adaptor end-face cleaning tool in which a tape-shaped cleaning cloth on the top of the tool moves and cleans

3.9**gas and vacuum type cleaning machine**

optical connector end-face cleaning machine in which volatile liquid solvent (gas) is injected and extracted from a nozzle

3.10**air duster**

cleaning tool in which compressed air is blown from a nozzle of a can

Note 1 to entry: It is sometimes called canned air.

3.11**dust cap**

cover or cap which is attached to an optical connector plug, an optical connector adaptor or an optical receptacle when the optical connector is not connected to protect it from contamination

4 Application of receptacle style optical transceivers and influence of contamination on optical connector end-face**4.1 Application of receptacle style optical transceivers**

Almost all optical receptacle style transceivers are of a pluggable type. Pluggable optical transceivers are often attached to the front panels of optical network equipment, for installation and maintenance the pluggable optical transceivers (as well as patch cords) are