



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

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 It supersedes [PD IEC/TR 62572-4:2013](#), which is withdrawn.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.

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Published by BSI Standards Limited 2020

ISBN 978 0 539 11998 5

ICS 33.180.01

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 September 2020.

Amendments/corrigenda issued since publication

Date	Text affected
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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**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.180.01

ISBN 978-2-8322-8780-4

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CONTENTS

FOREWORD 4

INTRODUCTION 6

1 Scope 7

2 Normative references 7

3 Terms and definitions 7

4 Application of receptacle style optical transceivers and influence of contamination on optical connector end-face 9

 4.1 Application of receptacle style optical transceivers 9

 4.2 Influence of contamination on optical connector plugs 9

 4.3 Transferring of contamination 9

 4.4 Influence of contamination of optical connector for optical transceivers 9

5 Care in handling of receptacle style optical transceivers 9

 5.1 General 9

 5.2 Storage of receptacle style optical transceivers 9

 5.3 Installation of receptacle style optical transceivers 10

 5.4 Connection of optical connector plugs to receptacle style optical transceivers 10

 5.5 Removing of receptacle style optical transceivers 10

 5.6 Action in case of abnormality 10

6 Cleaning tools and machines 10

 6.1 General 10

 6.2 Cleaning tools and machines for optical receptacles 11

7 Internal structure of receptacle style optical transceivers and their applicable cleaning tools and machines 11

 7.1 General 11

 7.2 Single-fibre optical connector interface type 11

 7.3 Multifibre optical connector interface type 12

Annex A (informative) Detail information of optical connector end-face cleaning tools and machines 14

 A.1 Reel type cleaner 14

 A.2 Stick type cleaner 14

 A.3 Pen type cleaner 14

 A.4 Gas and vacuum cleaning machine 15

 A.5 Air blower 16

 A.6 Wet clean 16

Annex B (informative) Detailed information on the internal structure of receptacle style optical transceivers and their applicable cleaning tools and machines 17

 B.1 Internal structure of receptacle style optical transceivers 17

 B.2 Example of the method to distinguish internal structure of receptacle style optical transceivers 17

 B.3 Applicable cleaning tools and machines according to internal structure of receptacle style optical transceivers 18

 B.3.1 General 18

 B.3.2 Characteristics of stub type optical transceivers 18

 B.3.3 Characteristics of lens type optical transceivers 18

 B.3.4 Characteristics of plate contact type optical transceivers 19

Annex C (informative) Cleaning procedure of optical connector end-face of receptacle style optical transceivers 20

C.1	Basic cleaning procedure	20
C.2	Cleaning procedure of stick type cleaner	20
C.3	Cleaning procedure of pen type cleaner	21
C.4	Cleaning procedure of gas and vacuum type cleaning machine	21
C.5	Cleaning procedure of air duster	21
C.6	Other important points	21
Annex D (informative) Examples of inspection instruments for an optical connector receptacle end-face		23
Bibliography		24
Figure A.1	– Example of a reel type cleaner	14
Figure A.2	– Examples of stick type cleaners	14
Figure A.3	– Example of a single-fibre interface pen type cleaner	15
Figure A.4	– Examples of a multifibre interface pen type cleaner	15
Figure A.5	– Example of gas and vacuum cleaning machine	15
Figure A.6	– Example of air duster	16
Figure B.1	– Internal structures for connecting to optical connector plug	17
Figure C.1	– Cleaning an optical transceiver receptacle end-face by a stick type cleaner	20
Figure C.2	– Cleaning optical transceiver receptacle end-face using a pen type cleaner	21
Figure D.1	– Examples of optical connector end-face visual inspection equipment	23
Table 1	– Typical optical connector receptacle cleaning tools and machines	11
Table 2	– Applicable cleaning tools and machines depending on the internal structure of single-fibre optical connector interface from optical transceivers	12
Table 3	– Applicable cleaning tools and machines depending on the internal structure of multifibre connector interface optical transceivers	13

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 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.

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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) 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 2017 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) connectors (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