IEC 61300-2-54

Edition 1.0 2019-11

INTERNATIONAL STANDARD

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-54: Tests – Corrosive atmosphere (mixed gas)

IEC 61300-2-54:2019-11(en)

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INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.180.20

ISBN 978-2-8322-7594-8

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 61300-2-54 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
86B/4232/FDIS	86B/4246/RVD

Full information on the voting for the approval of this International Standard 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.

The list of all parts of IEC 61300 series, published under the general title, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures,* 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- withdrawn,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.

A bilingual version of this publication may be issued at a later date.

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 2-54: Tests – Corrosive atmosphere (mixed gas)

1 Scope

The purpose of this part of IEC 61300 is to assess the corrosive effects of atmospheres polluted with mixed gas on fibre optic devices. It can be considered as a general corrosion test, but it does not predict the performance of a device in use.

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.

IEC 60068-2-60, *Environmental testing – Part 2: Tests – Test Ke: Flowing mixed gas corrosion test*

IEC 61300-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 1: General and guidance*

IEC 61300-3-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-1: Examinations and measurements – Visual examination*

IEC 61300-3-4, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-4: Examinations and measurements – Attenuation*

IEC 61300-3-6, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

3 Terms and definitions

No terms and definitions are listed in this document.

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

4 General description

This test

– is intended to assess the corrosive effects of atmospheres polluted with mixed gas on fibre optic devices,

– is particularly suitable for giving information on a comparative basis, and

– can be considered as a general corrosion test, but it does not predict the performance of a device in use.

5 Apparatus

The apparatus consists of a test chamber in accordance with IEC 60068-2-60, Test Ke. The test chamber and its auxiliary parts shall be made of materials that do not react with or absorb mixed gas and which do not influence the corrosive effects of the test atmosphere. The mixture of air and mixed gas shall enter and leave the chamber through tubes with sufficiently large diameters such that the total flow through the chamber is at least three, but not more than five, changes of the atmosphere per hour. The exhaust from the chamber should not be allowed to enter the laboratory.

The detailed construction of the chamber including the method of producing the test atmosphere is optional, provided that

a) the conditions in that part of the chamber occupied by the device under tests (DUTs) are within the specified limits,
b) the DUTs are protected from direct exposure to the individual incoming gas flows,
c) arrangements are made to move the DUTs through the test atmosphere at an average rate of 0,0055 m/s to 0,0167 m/s (approximately 20 m/h to 60 m/h) or, alternatively, to gently stir the atmosphere, obtaining a similar relative velocity between atmosphere and DUTs, and
d) condensation on the DUT does not occur inside the test chamber.

6 Procedure

6.1 Description of the DUT

Prepare the DUT according to the manufacturer's instructions or as specified in the relevant specification.

The DUTs shall be exposed mated connectors and unmounted devices as prescribed in the relevant specification.

The DUTs shall be operational or not operational according to relevant specifications.

The DUTs shall be continuously exposed to the test atmosphere for the period specified in this document (96 h).

6.2 Initial examination and measurement

The DUT shall be terminated with a sufficient length of fibre cable to facilitate connection with the optical source and detector.

Prior to the tests, make the initial measurements and the initial visual examination as defined in the relevant specification.

For visual examination, IEC 61300-3-1 applies.

For attenuation measurements, IEC 61300-3-4 applies.

For return loss measurements, IEC 61300-3-6 applies.

6.3 Preconditioning

Clean the mechanical and optical alignment parts of the DUT according to the manufacturer's instructions.

Unless otherwise stated, maintain the DUT under standard atmospheric condition according to IEC 61300-1 for 2 h minimum.

6.4 Conditioning

Attenuation and return loss measurements shall be performed when required by the relevant specification.

Place the DUTs in the chamber in the normal operating position. Prior to the start of the test, it shall be established by suitable measurements that stable conditions for the concentration of mixed gas, the temperature and the relative humidity have been achieved. Periodic checks shall be made during test to ensure that these conditions are maintained.

Care should be taken that the DUTs are so placed that they do not come into contact with one another and that they do not shield one another from the test atmosphere.

Adequate precautions shall be taken to ensure that the DUTs are not disturbed during the exposure period.

6.5 Recovery

Allow the DUT to remain under standard test conditions for 2 h minimum, as defined in IEC 61300-1, unless otherwise specified in the relevant specification. Clean the optical surfaces, but not the exterior surface that may have been corroded.

6.6 Final examinations and measurements

On completion of the test, remove all fixtures and make final measurements, as defined by the relevant specification. The results of the final measurement shall be within the limit established in the relevant specification.

Unless otherwise specified, visually examine the DUT in accordance with IEC 61300-3-1. Check for growths, corrosion or pitting on the DUT. This may include, for example,

– broken, loose or damaged parts or accessories,
– broken, cracked or damaged cable jacket, seals or strain relief, and
– displaced, bent, or broken parts.

For attenuation measurements, IEC 61300-3-4 applies.

For return loss measurements, IEC 61300-3-6 applies.

7 Severity

The severity consists of the duration of exposure. The severity shall be specified in the relevant specification.

The preferred severity for IEC 61753-1 category I and I^{HD} is shown in Table 1.