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INTERNATIONAL STANDARD

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 2-28: Tests – Industrial atmosphere (sulphur dioxide)

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IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

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FOREWORD

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International Standard IEC 61300-2-28 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 1995. It constitutes a technical revision.

The main change with respect to the previous edition is the reconsideration of Clauses 5 and 6, Procedure and Severity, respectively.

The text of this standard is based on the following documents:

FDIS	Report on voting
86B/3619/FDIS	86B/3651/RVD

Full information on the voting for the approval of this standard 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.

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

- 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- withdrawn,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 2-28: Tests – Industrial atmosphere (sulphur dioxide)

1 Scope

The purpose of this part of IEC 61300 is to assess the corrosive effects of atmospheres polluted with sulphur dioxide on fibre optic devices. The procedure is only suitable for comparative purposes. It can be considered a general corrosion test, but which does not predict the behaviour of the devices in use.

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 60068-2-42, *Environmental testing – Part 2-42: Tests – Test Kc: Sulphur dioxide test for contacts and connections*

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*

3 General description

This test

– is intended to provide accelerated means to assess the corrosive effects of atmospheres polluted with sulphur dioxide on fibre optic devices,

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

– is not suitable as a general corrosion test, i.e. it may not predict the behaviour of fibre optic devices in industrial atmospheres.

4 Apparatus

The apparatus consists of a test chamber in accordance with IEC 60068-2-42, Test Kc. The test chamber and its auxiliary parts shall be made of materials that do not react with or absorb sulphur dioxide and which do not influence the corrosive effects of the test atmosphere. The mixture of air and sulphur dioxide 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 specimens are within the specified limits,

b) the specimens under test are protected from direct exposure to the incoming gas flow,

c) arrangements are made to move the specimens through the test atmosphere at an average rate of 20 m/h to 60 m/h (approximately 6 mm/s to 17 mm/s) or, alternatively, to gently stir the atmosphere, obtaining a similar relative velocity between atmosphere and specimens,

d) condensation on the specimen does not occur inside the test chamber.

5 Procedure

5.1 General

Prepare the specimen according to the manufacturer's instructions or as specified in the relevant specification. The specimen shall be terminated with a sufficient length of fibre cable to facilitate connection with the optical source and detector.

5.2 Preconditioning

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

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

5.3 Measurements

Place the specimens in the chamber in its normal operating position and make connections to the monitoring equipment.

Prior to the start of the test it shall be established by suitable measurements that a stable conditions for the concentration of sulphur dioxide, 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 specimens 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 specimens are not disturbed during exposure period.

Specimens shall be exposed mated and/or unmated as prescribed in the relevant specification.

The specimens shall be operational and/or not operational according to relevant specifications.

The specimens shall be continuously exposed to the test atmosphere for the period specified by the relevant specification.

5.4 Recovery

Allow the specimen to remain under standard test conditions for 2 h, as defined in IEC 61300-1, unless otherwise specified in the relevant specification. Clean the specimen according to the manufacturer's instructions.

5.5 Final examinations and measurements

On completion of the test, remove all fixtures and make final measurements, as defined by the relevant specification, to ensure that there is no permanent damage to the specimen. The results of the final measurement shall be within the limit established in the relevant specification.

Unless otherwise specified, visually examine the specimen in accordance with IEC 61300-3-1. Check for evidence of any degradation in the specimen. This may include, for example

– broken, loose or damaged parts or accessories,
– breaking or damage to the cable jacket, seals, strain relief, or fibres,
– displaced, bent, or broken parts.

6 Severity

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

The preferred severities for category E, shown in Table 1, are non-mandatory severities which may be specified for this procedure. Sulphur dioxide shall be taken as the total oxides of sulphur expressed as SO_2. Small concentrations of sulphur oxides other than SO_2 (such as SO_3) are permitted to be present to a maximum concentration of 1 % of the total sulphur oxides. The relative humidity shall be held as close as possible to 75 % but shall in no case exceed 80 % nor fall below 70 %.

Table 1 – Severities for category E

Parameter	Value
Sulphur dioxide	$(25 \pm 5) \times 10^{-6}$ (vol/vol)
Temperature	25 °C ± 2 °C
Relative humidity	75 %
Duration	4 days

7 Details to be specified

The following details, as applicable, shall be specified in the relevent specification:

– test severities;
– specimen optically functioning or non-functioning;
– specimen mated or unmated;
– pre-conditioning procedure;
– test duration;
– recovery procedure, duration;
– initial examinations and measurements and performance requirements;
– examinations and measurements during test and performance requirements;
– final examinations and measurements and performance requirements;
– deviations from test procedure;
– additional pass/fail criteria.

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

3, rue de Varembé
PO Box 131
CH-1211 Geneva 20
Switzerland

Tel: + 41 22 919 02 11
Fax: + 41 22 919 03 00
info@iec.ch
www.iec.ch