IEC 61300-2-26

Edition 3.0 2023-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 2-26: Tests – Salt mist

Dispositifs d'interconnexion et composants passifs fibroniques – Procédures fondamentales d'essais et de mesures –
Partie 2-26: Essais – Brouillard salin

IEC 61300-2-26:2023-07(en-fr)

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

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IEC 61300-2-26 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics. It is an International Standard.

This third edition cancels and replaces the second edition published in 2006. This edition constitutes a technical revision.

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

a) addition of Clause 3, Terms and definitions;
b) harmonisation with IEC 61753-1:2018 and addition of Table 2;

c) harmonisation with IEC 60068-2-11:2021.

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

Draft	Report on voting
86B/4764/FDIS	86B/4777/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of the 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 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- withdrawn,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.

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

Part 2-26: Tests – Salt mist

1 Scope

This part of IEC 61300 provides a test to determine the corrosion resistance of the metals used in the construction of fibre optic interconnecting devices and passive components. This document determines if dissimilar metals have been well finished to prevent corrosion. The requirements of the tests for these devices are defined in IEC 61753-1.

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 60068-2-11:2021, *Environmental testing – Part 2: Tests – Test Ka: Salt mist*

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

IEC 61300-2-38, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-38: Tests – Sealing for pressurized fibre optic closures*

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 61300-3-3, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-3: Examinations and measurements – Active monitoring of changes in attenuation and return loss*

IEC 61300-3-35, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-35: Examinations and measurements – Visual inspection of fibre optic connectors and fibre-stub transceivers*

IEC 61753 (all parts), *Fibre optic interconnecting devices and passive components – Performance standard*

IEC 62005 (all parts), *Fibre optic interconnecting devices and passive components – Reliability*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61300-1 apply.

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

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

4 General description

WARNING – This document can involve hazardous materials, operations and equipment. This document does not propose to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

This procedure is conducted in accordance with IEC 60068-2-11, test Ka. The device under test (DUT) is exposed to a salt mist environment within a test chamber maintained at a temperature of (35 ± 2) °C.

The relationship between the deterioration provided by this test and long-term exposure of products to salt laden atmospheres cannot be readily determined. But it provides a useful means of comparing resistance of products to deterioration from salt laden atmospheres.

5 Salt solution

5.1 Preparation of salt solution

The salt solution concentration shall be (5 ± 1) % by weight. The solution shall be prepared by dissolving (5 ± 1) parts by weight of salt in 95 parts by weight of distilled or deionized water with a conductivity not higher than 20 µS/cm at (25 ± 2) °C. The sodium chloride concentration of the sprayed solution collected shall be (5 ± 1) % by weight. The specific gravity range for a 5 % by weight salt solution concentration is 1,029 to 1,036 at 25 °C.

The sodium chloride shall not contain a mass fraction of the heavy metals copper (Cu), nickel (Ni), and lead (Pb) in total more than 0,005 %. It shall not contain a mass fraction of sodium iodide more than 0,1 % and a mass fraction of total impurities more than 0,5 %, calculated for dry salt.

5.2 pH adjustment

If necessary, adjust the pH of the salt solution so that pH of the sprayed solution collected within the test chamber is 6,5 to 7,2 at (25 ± 2) °C. Check the pH using electrometric measurement. Measurements of pH shall be done using electrodes suitable for measuring in weakly buffered sodium chloride solution in deionized water.

Make any necessary corrections by adding hydrochloric acid, sodium hydroxide or sodium bicarbonate solution of analytical grade.

5.3 Filtration

If necessary, filter the solution before placing it in the reservoir of the apparatus, to remove any solid matter which might block the apertures of spraying device.

5.4 Re-use

The sprayed solution shall not be re-used.

6 Apparatus

6.1 Chamber

The chamber for this test shall be constructed of such materials that will not influence the corrosive effects of the salt mist.

The detailed construction of the chamber, including the method of producing the mist, is optional, provided the following is applied.

a) The operating conditions in the chamber shall be within the limits specified.
b) The chamber shall have sufficient volume and performance that the introduction of the DUTs will not detrimentally affect the control of the conditions.
c) The solution shall not be sprayed directly onto the DUTs but rather spread throughout the test chamber so that it falls naturally down to them.
d) The upper parts of the chamber shall be designed so that drops of sprayed solution formed on its surface do not fall on the DUTs being tested.
e) The chamber shall be properly vented to prevent pressure build-up and allow uniform distribution of salt mist. The discharge end of the vent shall be protected from strong air currents which can have a negative effect to the air flow.
f) The test temperature shall be measured at least 100 mm from walls and radiant heat sources.

6.2 Atomizer

The atomizer(s) used shall be of such design and construction as to produce a finely divided, wet, dense mist. The atomizer(s) shall be made of material that is non-reactive to the salt solution.

6.3 Air supply

The compressed air entering the atomizer(s) shall be essentially free from all impurities, such as oil and dust.

Means shall be provided to humidify and warm the compressed air as required to meet the operating conditions. The atomizing pressure shall be at an over pressure of 70 kPa to 170 kPa. The pressure is typically (98 ± 10) kPa but can vary depending on the type of the chamber and atomizer used. The appropriate temperature depends on the pressure used and on the type of atomizer. Temperature, pressure or humidification, or a combination thereof, shall be adjusted so that the rate of collection of the spray in the chamber and the concentration of the collected spray are kept within the specified limits (see Table 2). A commonly used humidifier is the saturation tower, where temperature and pressure are controllable. Table 1 gives suggested values on temperature and pressure combinations for the saturation tower. Distilled or deionized water with a conductivity not higher than 20 µS/cm at (25 ± 2) °C shall be used for humidification of spray air.

To ensure against clogging of the atomizer by salt deposition, it is recommended that the air have a relative humidity of at least 85 % at the point of release from the nozzle. A satisfactory method is to pass the air in very fine bubbles through a tower containing heated water which shall be automatically maintained at a constant level. The temperature of this water should be at least 35 °C. The permissible water temperature increases with increasing volume of air and with decreasing heat insulation of the chamber and the surroundings of the chamber. The temperature should not exceed a value above which an excess of moisture is introduced into the chamber or a value which makes it impossible to meet the requirements for operating temperature.

Table 1 – Suggested values for the temperature of the hot water in the saturation tower

Atomizing overpressure kPa	Suggested values for the temperature of the hot water in the saturation tower when performing the salt mist test °C
70	45
84	46
98	48
112	49
126	50
140	52
160	53
170	54

6.4 Collecting devices

At least two collecting devices shall be used to check the homogeneity of the spray of the chamber. A collecting device shall consist of a collecting funnel which has a diameter of (100 ± 2) mm, corresponding to a collecting area of approximately 80 cm^2. The funnel should be made of chemically inert material and its stem inserted into a suitable measuring container.

7 Verification of the corrosivity of the apparatus

The corrosivity of the apparatus, especially the chamber, should be verified at regular intervals to check the reproducibility of the test results. IEC 60068-2-11 describes the detail information.

8 DUT

The sample size and type of DUT shall be selected in accordance with the relevant part of the IEC 61753 series performance standard or IEC 62005 series reliability specification.

9 Procedure

9.1 Preparation of DUT

Prepare the DUT in accordance with the manufacturer’s instructions.

Visually check the DUT for any damages according to IEC 61300-3-1.

9.2 Preconditioning

Inspect the optical connector endface according to IEC 61300-3-35. Clean the mechanical and optical alignment parts of the DUT according to the manufacturer's instructions, if necessary. The cleaning method used shall not interfere with the effect of the salt mist on the DUT.

NOTE Cleaning methods for optical connectors and optical transceivers are described in IEC TR 62627-01 and IEC TR 62572-4, respectively.

Unless otherwise specified, expose the DUT for at least 2 h at the standard atmospheric conditions as defined in IEC 61300-1.

9.3 Initial examinations and measurements

Perform initial examinations and measurements as required by the relevant part of the IEC 61753 series performance standard or IEC 62005 series reliability specification. Complete initial visual examination on the DUT as required by IEC 61300-3-1. For optical properties measurement, the equipment and measurement methods shall be according to IEC 61300-3-3 for change in attenuation and return loss measurement. The optical performance measurement shall be performed at the wavelength(s) specified in the relevant part of the IEC 61753 series performance standard or IEC 62005 series reliability specification.

9.4 Conditioning

Conduct the procedure in accordance with IEC 60068-2-11, test Ka. The angle at which the surface of the DUT is exposed in the chamber is very important. Unless otherwise specified, DUTs shall be mounted at an angle of 20 ° ± 2 ° to the vertical, with the area of primary interest facing up.

Unless otherwise specified, the DUT shall be subjected to the test in a non-operational mode.

Stabilize the chamber and the DUT to standard atmospheric conditions. Place the DUT in the chamber in its normal operating position including hook-ups to peripheral equipment (when required).

Adjust the chamber temperature and average collection rate as well as maintain the conditions of the salt concentration of the solution from the atomizer and collected solutions as noted in Table 2 for the severity provided in Table 3.

Table 2 summarises the test conditions.

Table 2 – Summary of test conditions

Parameters	Conditions
Temperature	(35 ± 2) °C
Average collection rate of a horizontal collecting area of 80 cm^2	(1,5 ± 0,5) ml/h
Concentration of sodium chloride (collected solution)	(5 ± 1) %
pH (collected solution)	6,5 to 7,2 (at 25°C ± 2°C)

At the completion of the test, allow the DUT to remain in the chamber while the temperature is gradually reduced to standard atmospheric conditions.

9.5 Recovery

At the completion of the test, unless otherwise specified, the DUT shall be washed in running tap water for 5 min, rinsed in distilled or deionized water. The temperature of the water used for washing shall not exceed 35 °C.

Unless otherwise specified, allow the DUT to remain under standard atmospheric conditions for 2 h, as defined in IEC 61300-1.

Inspection and cleaning procedures of the interconnecting parts should be used prior to reconnecting with optical measurement equipment. For passive optical components having connector plugs/adaptors, interconnecting parts should be inspected, if necessary.