

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 2-17: Tests – Cold

Dispositifs d'interconnexion et composants passifs à fibres optiques –
Méthodes fondamentales d'essais et de mesures –
Partie 2-17: Essais – Froid



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING DEVICES
AND PASSIVE COMPONENTS –
BASIC TEST AND MEASUREMENT PROCEDURES –****Part 2-17: Tests – Cold**

FOREWORD

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International Standard IEC 61300-2-17 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This third edition cancels and replaces the second edition published in 2003. This edition constitutes a technical revision. The main changes with respect to the previous edition are listed below:

- a) Procedure and details to be specified were reconsidered.
- b) The deviation of the temperature in severity was changed $\pm 3\text{ °C}$ to $\pm 2\text{ °C}$.

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

CDV	Report on voting
86B/2984/CDV	86B/3089/RVC

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 in the 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

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

Part 2-17: Tests – Cold

1 Scope

This part of IEC 61300 details a procedure for determining the suitability of a fibre optic device to withstand environmental conditions of extended low temperature (cold), which may occur in use, storage and/or transport. This procedure does not assess the ability of a device to operate during temperature variations; in this case, IEC 61300-2-22 would be used.

2 Normative references

The following referenced documents are indispensable for the application 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 60068-2-1, *Environmental testing – Part 2-1: Tests – Test A: Cold*

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

<https://standards.iteh.ai/catalog/standards/sist/6561285-1e9-4b6-e129-9865-5c2b77e6-61300-2-17-2010>

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 procedure is conducted in accordance with IEC 60068-2-1, test Ab. The Device Under Test (DUT) is placed in a chamber at ambient temperature. The temperature is then lowered to test temperature at a rate not exceeding 1 °C/min averaged over a maximum period of 5 min, and maintained at that temperature for the specified duration. The chamber temperature is then raised to ambient and the DUT is allowed to attain ambient temperature before final measurements are made.

4 Apparatus

4.1 Chamber

The apparatus is an environmental chamber in accordance with IEC 60068-2-1, test Ab. The chamber shall be capable of housing the DUT and of allowing access for measurement during conditioning, if required. It shall also be capable of maintaining the specified temperature and tolerance. Forced air circulation may be used to maintain homogeneous conditions. Care shall be taken to ensure that the DUT is not directly exposed to the heating or cooling elements.

4.2 Other apparatus

Additional apparatus may be necessary to perform the measurements specified by the relevant specification.

4.3 Support for mounting the DUT

Unless otherwise specified in the relevant specifications, the thermal conductivity of the supports for mounting the DUT shall be low, such that for practical purposes the DUT is thermally isolated.

5 Procedure

5.1 General

Conduct the test according to the following procedure.

Unless otherwise specified in the relevant specification, the following applies:

- if the component construction includes optical leads, include 1,5 m of cable in the environmental chamber for each port monitored during the test;
- if optical measurements are requested during the test by the relevant specification, these measurements shall be performed at a maximum interval of 1 h.

5.2 Preconditioning

Unless otherwise stated in the relevant specification, maintain the DUT under standard atmospheric conditions specified in IEC 61300-1 for a minimum of 2 h. Clean the mechanical and optical alignment parts of the DUT according to the manufacturer's instructions.

5.3 Initial measurements (standards.iteh.ai)

Complete initial examinations and measurements as required by the relevant specification.

5.4 Testing

- a) Place the DUT in the chamber in its normal operating position and make connections to the monitoring equipment.
- b) Adjust the chamber temperature to the specified severity. The rate of change of temperature shall not exceed 1 °C/min, averaged over a maximum period of 5 min. Allow the DUT to reach temperature stability. The relevant specification may call for measurements to be made during the test and will give details of how this should be done.
- c) On completion of the test, allow the DUT to remain in the chamber while the temperature is gradually raised to standard atmospheric conditions. The rate of change of temperature shall not exceed 1 °C/min, averaged over a maximum period of 5 min.

5.5 Recovery

Dry the DUT if necessary and allow it to remain under standard atmospheric conditions for a period of 2 h.

5.6 Final measurements

On completion of the test, remove all fixtures. Clean the mechanical and optical alignment parts of the DUT according to the manufacturer's instructions. Take final measurements as required by the relevant specification. If specified, visually examine the DUT in accordance with IEC 61300-3-1 and take any measurements specified to ensure that there is no permanent damage.

6 Severity

The severity consists of the combination of the temperature and duration of exposure:

- the duration of exposure shall be 96 h;
- temperature deviation shall be less than ± 2 °C.

One of the following severities shall be specified for this procedure:

Temperature °C
-40
-25
-10

7 Details to be specified

The following details shall be specified in the relevant specification:

- manual or automatic test;
- initial examinations, measurements and performance requirements;
- examinations and measurements during test and performance requirements;
- final examinations, measurements and performance requirements;
- deviations from test procedure;
- additional pass/fail criteria.

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Bibliography

IEC 61300-2-22, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-22: Tests – Change of temperature*

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