

INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 1
AMENDEMENT 1

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

**Dispositifs d'interconnexion et composants passifs fibroniques – Procédures fondamentales d'essais et de mesures –
Partie 1: Généralités et recommandations**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 1: General and guidance

AMENDMENT 1

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Amendment 1 to IEC 61300-1:2022 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

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

Draft	Report on voting
86B/4865/FDIS	86B/4900/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 Amendment 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/.

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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- withdrawn, or
- revised.

Add the following new subclause:

4.2.3 Requirements for test sample configuration in environmental test chamber

Annex C defines example configuration of the test sample, and specifies the fibre, pigtail, or cable length inside the environmental test chamber for different test sample types.

Add the following new Annex C

Annex C (normative)

Test sample configuration in environmental test chamber

C.1 General

Annex C defines the configurations of the test samples and the fibre, pigtail, or cable lengths inside the environmental test chamber for the different test sample types, such as:

- pigtail,
- hardened connector pigtail,
- patchcord,
- non-connectorized passive component,
- connectorized passive component,
- plug-receptacle style passive component,
- fibre management system,
- protective housing without looped cable,
- protective housing with looped cable,
- combined protective housing test sample with looped cable,
- mechanical splice or fusion splice.

An environmental test chamber is used for temperature cycling, dry heat, cold, damp heat, and similar tests.

The test sample configuration and the fibre, pigtail, or cable lengths inside the environmental test chamber shall be as given in clauses C.2 to C.12, unless otherwise specified in the relevant IEC 61753 performance standard and IEC 62005 reliability document.

The method of storage shall not affect the optical fibre with respect to expansion or contraction. Tight coiling on a rigid cable reel shall not be used. The overlength of the fibres, pigtails, or cables of the sample inside the chamber shall be routed in large diameter loose coils or bends. The diameter of the coils or bends shall be larger than the minimum bending diameter specified for the cable in service. The fibre, pigtail, or cable coils shall be loosely fixed in a way that the cable elements are not under stress and are free to move.

The test sample or the additional pigtails should have unterminated leads of sufficient length to allow termination (splicing, connecting, etc.) to the optical monitoring equipment located outside of the environmental test chamber. The deployment of the fibre, pigtail, or cable outside the chamber shall not affect the results.

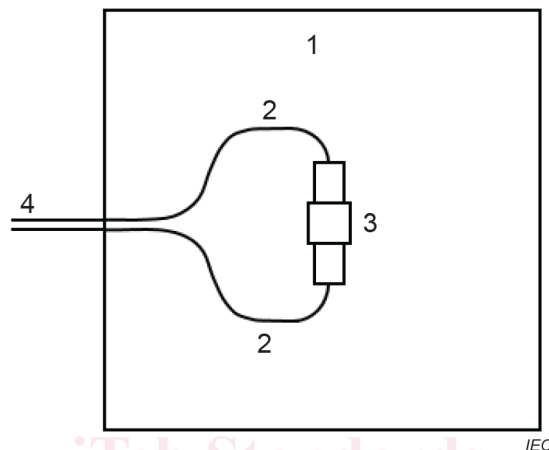
The configurations are shown with one incoming and one outgoing fibre, pigtail, or cable of a test sample in Figure C.1 to Figure C.12 for illustrative purposes. Different types of test samples exist having one or more incoming and one or more outgoing fibres, pigtails, or cables, or even an incoming fibre, pigtail, or cable only. The test sample configurations and length specifications for such test samples shall be applied analogously.

When several test samples are tested in the same chamber, the test samples shall be placed in such a way that they do not influence each other and do not exert any load on other test samples. The test samples can be placed side-by-side or on different height levels. Care should be taken to ensure that either the specified temperature or humidity, or both, is present for all samples. The test sample configuration and length specification for multiple test samples shall be applied analogously.

NOTE When using a protective housing test sample configuration from C.10 to C.11, experience shows that the test samples can successfully meet the temperature change requirements outlined in the IEC 61753 series in this configuration, provided the cables are suitable for the specified operating temperature range. This means that the fibre protrusion after temperature changes is ≤ 20 mm at the terminated cable ends in the housings.

C.2 Pigtail test sample

The pigtail test sample should be placed inside the environmental test chamber as shown in Figure C.1. This configuration should be used for connectors terminated on pigtails and is intended for non-hardened connectors. For hardened connectors see C.3.



Key

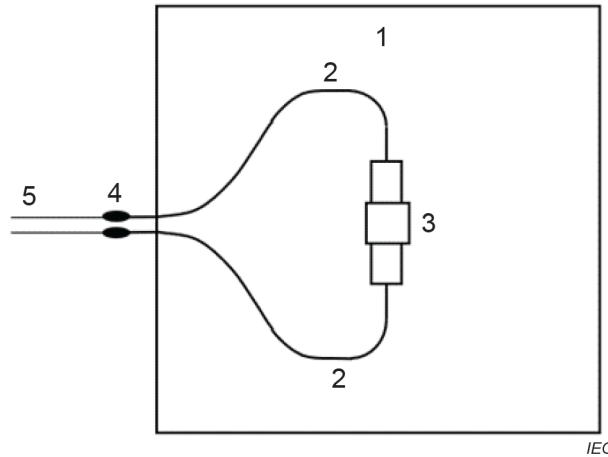
- 1 environmental test chamber
- 2 pigtail
- 3 adaptor, if required
- 4 incoming and outgoing pigtails whose fibres are connected to the measurement equipment

Figure C.1 – Example configuration of a pigtail test sample

Each pigtail should be ≥ 3 m in length and a length of $\geq 1,5$ m shall be located inside the environmental test chamber. The end of the sheath and strength members of the reinforced cable may be outside or inside the environmental test chamber. An adaptor is required if a connector plug-adaptor-plug type is used. If a connector plug-socket type is used, no adaptor is required.

C.3 Hardened connector pigtail test sample

The hardened connector pigtail test sample should be placed inside the environmental test chamber as shown in Figure C.2. This configuration should be used for hardened connectors terminated on cables.



Key

- 1 environmental test chamber
- 2 hardened connector pigtail
- 3 adaptor, if required
- 4 all cable elements fixed of each pigtail
- 5 buffered format, if present, or otherwise the primary coated fibres with fibre ends connected to measurement equipment

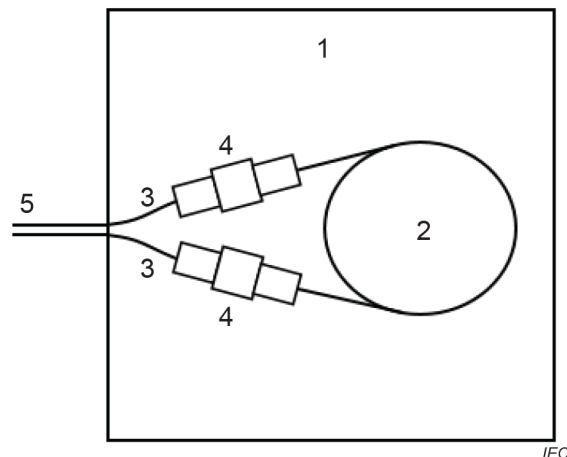
Figure C.2 – Example configuration of a hardened connector pigtail test sample

Each hardened connector pigtail shall be a length of ≥ 5 m inside the environmental test chamber. Just outside the environmental test chamber, all cable elements shall be fixed by clamps, glue, or other effective means. If present, the buffered fibres, or otherwise the primary coated fibres should be routed outside the environmental test chamber where the fibre ends are connected to the measurement equipment.

An adaptor is required if a hardened connector of the plug-adaptor-plug type is used. If a hardened connector of the plug-socket type is used, no adaptor is required.

C.4 Patchcord test sample

The patchcord test sample should be placed inside the environmental test chamber as shown in Figure C.3. This configuration can be used for non-hardened and hardened connectors.



Key

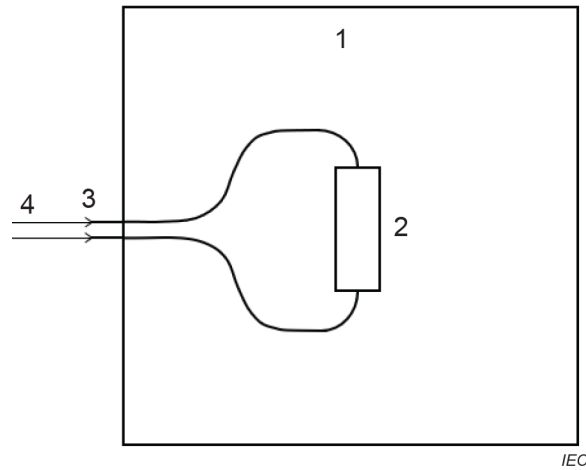
- 1 environmental test chamber
- 2 patchcord
- 3 pigtail
- 4 adaptor, if required
- 5 incoming and outgoing pigtails whose fibres are connected to the measurement equipment

Figure C.3 – Example configuration of a patchcord test sample

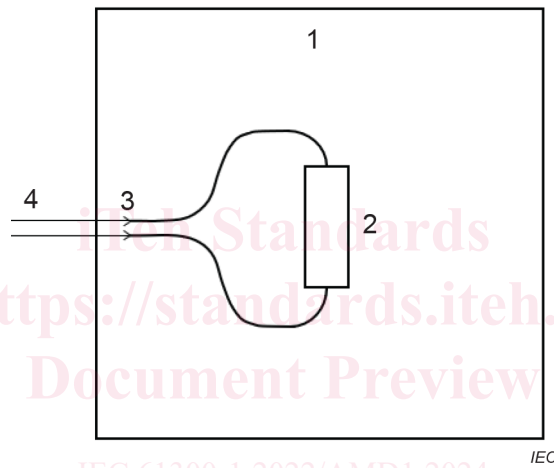
The length of the patchcord shall be $5,0 \text{ m} \pm 0,5 \text{ m}$. The length of each pigtail inside the environmental test chamber should be as short as possible. It is not necessary to use the same cable type for the pigtails and the patchcord. The pigtail cable type should not contribute to the change in attenuation. Adaptors are required if a connector of the plug-adaptor-plug type is used. If a connector of the plug-socket type is used, no adaptors are required.

C.5 Non-connectorized passive component test sample

Clause C.5 shows an example of a non-connectorized passive component test sample. For illustrative purposes, a non-connectorized passive component with one incoming and one outgoing fibre or cable is shown in Figure C.4 a) and Figure C.4 b). For passive component with only one incoming and no outgoing fibre, and either two or more incoming or two or more outgoing fibres, or both, the configuration should be as shown in Figure C.4 a) or Figure C.4 b), and the configuration should be recorded in a test report. The non-connectorized passive component test sample should be placed inside the environmental test chamber as shown in Figure C.4 a) or Figure C.4 b).



a) Sheath and strength members of the reinforced cable outside the environmental test chamber



b) Sheath and strength members of the reinforced cable inside the environmental test chamber

Key

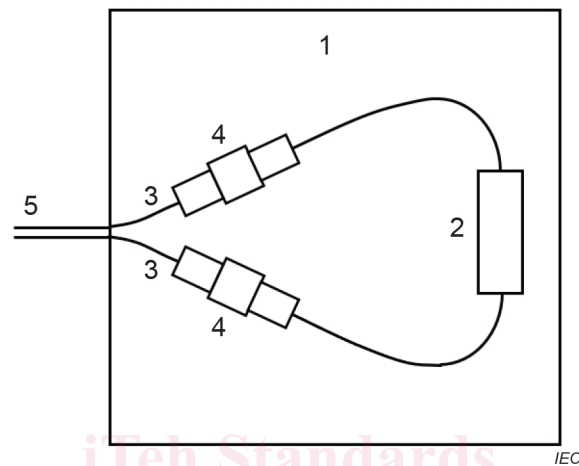
- 1 environmental test chamber
- 2 non-connectorized passive component with fibre or cable ends
- 3 end of complete reinforced cable of each pigtail where all cable elements are loose and not fixed to each other
- 4 buffered fibres or primary coated fibres with fibre ends connected to measuring equipment

Figure C.4 – Example configuration of a non-connectorized passive component test sample

The end of the sheath and strength members of the reinforced cable may be outside or inside the environmental test chamber as shown in Figure C.4 a) and Figure C.4 b). If the configuration in Figure C.4 a) is used, a fibre or cable length of $\geq 0,75$ m on each side of the passive component shall be located inside the environmental test chamber. If the configuration in Figure C.4 b) is used, a cable length of $\geq 0,75$ m from the end of the sheath and strength members of the reinforced cable to each side of the passive component shall be located inside the environmental test chamber.

C.6 Connectorized passive component test sample

This clause shows an example of a connectorized passive component test sample. For illustrative purposes, a connectorized passive component with one incoming and one outgoing fibre or cable is shown in Figure C.5. For passive component with only one incoming and no outgoing fibre, and either two or more incoming or two or more outgoing fibres, or both, the configuration should be similar as shown in Figure C.5 and the configuration should be recorded in test report. The connectorized passive component test sample should be placed inside the environmental test chamber as shown in Figure C.5.



Key

- 1 environmental test chamber
- 2 connectorized passive component
- 3 pigtail
- 4 adaptor, if required
- 5 incoming and outgoing pigtails for connection to measurement equipment

Figure C.5 – Example configuration of a connectorized passive component test sample

The length of each pigtail inside the environmental test chamber should be as short as possible. It is not necessary to use the same cable type for the pigtails and the passive component. The pigtail cable type should not contribute to the change in attenuation. Adaptors are required if a connector of the plug-adaptor-plug type is used. If a connector of the plug-socket type is used, no adaptors are required.

C.7 Plug-receptacle style passive component test sample

The plug-receptacle style passive component test sample should be placed inside the environmental test chamber as shown in Figure C.6. For illustrative purposes, a plug-receptacle style passive component with one incoming and one outgoing fibre port is shown in Figure C.6.