

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –
Part 2-2: Tests – Mating durability**

**Dispositifs d'interconnexion et composants passifs à fibres optiques –
Méthodes fondamentales d'essais et de mesures –
Partie 2-2: Essais – Durabilité de l'accouplement**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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International Standard IEC 61300-2-2 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, and constitutes a technical revision. Specific technical changes from the previous edition include a mating durability test for a plug-socket configuration, a new measurement condition and a new severity level.

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

FDIS	Report on voting
86B/2772/FDIS	86B/2804/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.

A 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 publication will remain unchanged until the maintenance result 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 2-2: Tests – Mating durability

1 Scope

The purpose of this part of IEC 61300 is to evaluate the effects of a number of successive cycles of engagement and separation of fibre optic connectors or other interconnecting devices on optical performance and mechanical degradation of the component under normal usage conditions.

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

3 General description

The devices under test (DUT) are subjected to a number of successive cycles of engagement and separation. If more than one coupling mechanism is involved, each cycle of engagement shall be conducted with all other mechanisms properly engaged.

4 Apparatus

The apparatus shall include the following elements:

4.1 Fixturing

The device should be tested under normal conditions of use. Where appropriate, suitable clamps, jaws or other means may be used to hold the mating parts of the device in proper alignment during the test.

4.2 Force applicator

Use a means of applying the force or torque to engage and separate the specimen. Unless otherwise stated, the force to engage the device shall be applied manually. Where required, a means of applying the engagement force or torque shall be specified.

4.3 Measuring equipment

Unless otherwise specified, measuring equipment specified in IEC 61300-3-4 shall be connected to the DUT for monitoring the optical performance during the test.

5 Procedure

5.1 Initial inspection

Complete initial examinations and measurements of the specimen as specified in the relevant specification.

5.2 Cycling

Unless otherwise specified in the relevant specification, a cycle shall consist of one normal full engagement and separation of the coupling mechanism to be evaluated. The minimum time between each engagement shall be 3 s.

When the specimen involves more than one coupling mechanism, the cycles shall be conducted with all mechanisms properly engaged. The mating shall be accomplished according to the manufacturer's instructions. In the case of a plug-adaptor-plug configuration, only one plug is subjected to successive engagement and separations cycles, see Figures 1 and 2.

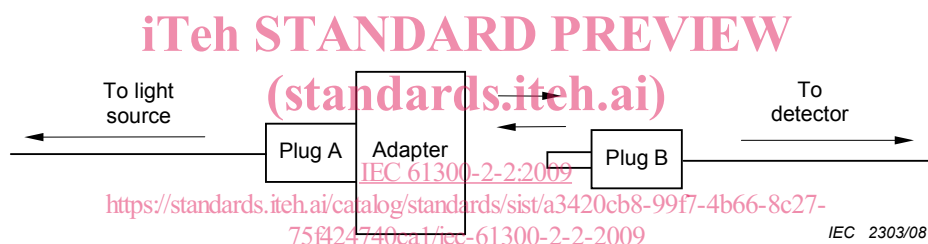


Figure 1 – Mating durability test for a plug-adaptor-plug configuration

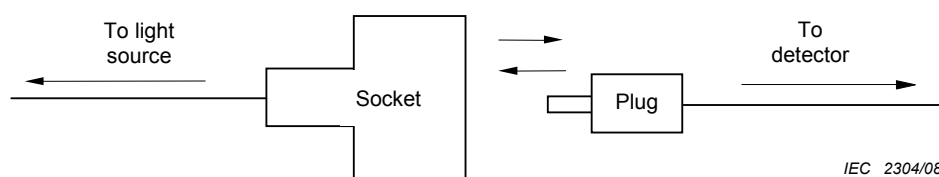


Figure 2 – Mating durability test for a plug-socket configuration

5.3 Measurements

5.3.1 General remark

The attenuation and/or return loss of the specimen shall be monitored during the test, as described in IEC 61300-3-3, unless otherwise specified in the relevant specification. The results shall be within the limit given in the specification.

Choose one of the measurement conditions below.

5.3.2 Measurement condition A

Measurements are recorded after every mating. If the value of attenuation or return loss exceeds the specified limit, the measurement should be recorded. The connector may then be cleaned according to the manufacturer's instructions and the test resumed. The cleaning of the connector shall be recorded.

The number of cleaning operations shall be limited to 20 (4 % of matings).

5.3.3 Measurement condition B

The sample population is divided as equally as possible into three specimen groups. Each group is mounted in a holding fixture (e.g. adapter panel) at the following distances from the floor: 0,9 m, 1,4 m and 1,8 m.

For each connector pair, perform an initial cleaning and record baseline optical measurements (e.g. attenuation, return loss). For each connector pair, perform optical measurements on every 25th mating. Clean only the cycled connector prior to every 25th mating. Clean both connectors prior to every 50th mating. The following sequence is an example:

0-1 Cleaning (both sides)
 1-1 Engagement
 1-2 Separation
 2-1 Engagement
 2-2 Separation

....

24-1 Engagement
 24-2 Separation
 24-3 Cleaning (cycled plug only)

25-1 Engagement

25-2 Measurement

25-3 Separation

....

49-1 Engagement
 49-2 Separation
 49-3 Cleaning (both connectors)

50-1 Engagement

50-2 Measurement

50-3 Separation

....

74-1 Engagement
 74-2 Separation
 74-3 Cleaning (cycled plug only)

75-1 Engagement

75-2 Measurement

75-3 Separation

....

199-1 Engagement

199-2 Separation

199-3 Cleaning (both connectors)

200-1 Engagement

200-2 Measurement

200-3 Separation

If, after the specified number of cycles has been reached, and a specimen does not meet the optical criteria after cleaning, then up to two re-cleanings are permitted.

5.3.4 Post test examination

After the test is complete, visually examine the specimens in accordance with IEC 61300-3-1. Check for

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- broken or excessively worn parts,
- inability to engage or separate properly,
- damage or wear to seals,
- breakage, chipping or scratching of the interface.

6 Severity

Select the severity level from Table 1.

Table 1 – Severity level

Severity level	Number of cycles
Measurement Condition A	500
Measurement Condition B	200

7 Details to be specified

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

- Coupling mechanism to be cycled (if multiple mechanism are involved)
- Initial examinations and measurements during test and performance requirements
- Value of change of attenuation and return loss allowed during the test
- Measurement condition
- Severity level
- Final examinations and measurements and performance requirements
- Deviations from the test procedure
- Additional pass/fail criteria

Bibliography

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

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