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Fibre optic interconnecting devices and passive components – Basic test and measurement procedures –

Part 2-34: Tests – Resistance to solvents and contaminating fluids of interconnecting components and closures

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Dispositifs d'interconnexion et composants passifs à fibres optiques –

Procédures fondamentales d'essais et de mesures –

Partie 2-34: Essais – Résistance des composants d'interconnexion et des boîtiers aux solvants et aux fluides contaminants



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Part 2-34: Tests – Resistance to solvents and contaminating fluids of interconnecting components and closures**

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Partie 2-34: Essais – Résistance des composants d'interconnexion et des boîtiers aux solvants et aux fluides contaminants**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**FIBRE OPTIC INTERCONNECTING
DEVICES AND PASSIVE COMPONENTS –
BASIC TEST AND MEASUREMENT PROCEDURES –****Part 2-34: Tests –
Resistance to solvents and contaminating fluids
of interconnecting components and closures**

FOREWORD

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International Standard IEC 61300-2-34 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. The main changes from the previous edition are as follows: the procedure and severity have been reconsidered.

This bilingual version, published in 2010-12, corresponds to the English version.

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

FDIS	Report on voting
86B/2826/FDIS	86B/2851/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 French version of this standard has not been voted upon.

A list of all the parts in the IEC 61300 series, 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 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,
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- replaced by a revised edition, or
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FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – BASIC TEST AND MEASUREMENT PROCEDURES –

Part 2-34: Tests – Resistance to solvents and contaminating fluids of interconnecting components and closures

1 Scope

The purpose of this part of IEC 61300 is for testing fibre optic interconnecting components and closures. The object of this test is to define a standard test method to assess the effects of short term exposure to fluids and lubricants on fibre optic interconnecting components and closures.

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

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3 General description

This test method covers the effects of contaminating fluids on the properties of fibre optic interconnecting components and closures. Testing is performed by immersing specimens in a specified fluid for a specified period at a specified temperature. A separate specimen shall be used with each fluid. Properties are measured prior to and after exposure to the fluid.

WARNING – *Intended users of this procedure are cautioned that tests of this nature may involve the use of certain hazardous material, operations and equipment. In particular, some of the fluids that may be used are flammable or may constitute health hazards, or both. Test temperatures should be at least 10 °C below the flashpoint of any fluid being used. Open flame heat sources should not be used with any organic solvents. Test personnel should consult the relevant material's safety data sheets when necessary.*

4 Apparatus

4.1 Containers

A boro-silicate glass or stainless steel vessel of suitable volume for each test fluid shall be used. Vessels shall be of sufficient size and capacity to permit the specimen to be immersed until it is fully covered in the selected fluid without violating other physical constraints (e.g. minimum cable bend radius).

4.2 Fluids

Fluids used shall be in accordance with the relevant specification for the fluid.

4.3 Heat source

A suitable heat source capable of achieving and maintaining the specified temperatures within ± 2 °C of the required setting shall be used.

4.4 Oven

A suitable oven to dry the specimen shall be used.

5 Procedure

5.1 General

The preparation of the specimen shall be in accordance with the relevant specification. If cables are fitted they shall be long enough to exit the test medium. Where no cables are fitted blanking plugs shall be inserted.

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 Initial examinations and measurements

If specified, perform initial examinations and measurements as required by the relevant specification.

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5.4 Conditioning

For each specified fluid, prepare a vessel with sufficient fluid such that the specimen can be adequately immersed.

Immerse the specimen for the specified period while maintaining the fluid temperature.

NOTE In the case of volatile fluids, it may be necessary to add additional amounts of fluid (heated to the test temperature) during the test in order to keep the specimen immersed.

5.5 Recovery

At the end of the immersion period, remove the specimen and wipe off surplus fluid.

Where applicable as defined in the relevant specification, dry components in an oven at an appropriate temperature for a defined period.

5.6 Final examinations and measurements

Upon completion of the test, the specimen(s) shall be examined and all necessary observations recorded as specified in the relevant specification. Careful attention shall be given to swelling of materials, loss of adhesive bonding between bonded surfaces, corrosion of materials, softening of materials, cracks in material, degradation of optical characteristics, etc.

The functional measurements shall be accomplished at the standard test conditions as defined in IEC 61300-1, unless otherwise specified in the relevant specification.

6 Severity

6.1 General

The severity consists of the combination of the fluid, exposure duration and the fluid temperature. The severity shall be specified in the relevant specification.

The following preferred severities are non-mandatory severities which may be specified for this procedure.

6.2 Exposure and drying duration

Specimen shall be exposed to the test for the following preferred duration:

Table 1 – Preferred test durations

1 h
24 h
5 days
7 days
1 month

After exposure specimen shall be recovered by drying applied according to the temperatures given in the relevant specification and durations mentioned below.

Table 2 – Preferred drying durations

1 h
2 h
24 h

The dry out temperature should be at maximum temperature of the service environment.

6.3 Fuels, lubricants, hydraulic fluids, cleaning agents and moisture repellents and anti-freeze agents

Table 3 provides a non-exhaustive list of recommended fluids.

Table 3 – List of test fluids

Chemical description	Test fluid code ^a	Test temperature °C
A mixture of toluene (aromatic) 30 % and iso-octane (aliphatic) 70 % (V/V)	-	40 ± 2
Wide cut aviation turbine fuel	F-34 ^b	70 ± 2
Di-octyl sebacate (aircraft turbine engine lubrication oil)	-	150 ± 2
Mineral oil, viscosity approximately 15 cSt at 38 °C	O-135 ^b	70 ± 2
Castor oil 20 %, ethoxyethanol 80 % (V/V) (this represents a normal hydraulic fluid)	-	20 ± 2
Phosphate ester hydraulic fluid (synthetic hydraulic fluid)	H-544 ^b	70 ± 2
Dimethyl silicone fluid (high temperature hydraulic fluid)	S-1720 ^b	150 ± 2
Monopropylene glycol (de-icing fluid)	S-745 ^b	20 ± 2
Lithium soap/synthetic oil grease (low temperature grease)	G-395 ^b	20 ± 2
Acetone	-	15 to 35
White spirit, 0,79 – 0,81 g/ml	-	15 to 35
Isopropyl alcohol	-	15 to 35
Petroleum jelly, Vaseline	-	15 to 35
HCl(pH2)	-	15-35
NaOH(pH12)	-	15-35
Kerosene	-	15-35
Diesel fuel	EN 590	15-35
10 % Nonyl Phenol Ethoxylate solution	-	50 ± 2

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^a Wherever possible the fluid given is specified in an International Standard or is described by its constituent chemicals. In some cases a NATO identification has been used in preference to a commercial identification. Reference to relevant commercial literature can correlate the NATO number with commercially available fluid(s).

^b NATO code.

7 Details to be specified

The following details, as applicable, shall be specified in the relevant specification.

- Test fluid
- Specimen optically functioning or non-functioning
- Specimen mated or unmated (capped or uncapped) and all spare ports sealed or capped
- Pre-conditioning procedure
- Immersion period
- Fluid temperature
- Recovery procedure, duration and temperature
- Initial examinations and measurements and performance requirements
- Final examinations and measurements and performance requirements
- Deviations from test procedure
- Additional pass/fail criteria

Bibliography

IEC 60068-2-74, *Environmental testing – Part 2-74: Tests – Test Xc: Fluid contamination*

ISO 1817, *Rubber, vulcanized – Determination of the effect of liquids*

EN 590, *Automotive fuels – Diesel – Requirements and test methods*

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