भारतीय मानक

Indian Standard

IS 16438 (Part 2/Sec 1) : 2019
IEC 61753-2-1 : 2000

प्रकाशिक तंतु परस्पर उपकरणों एवं निष्क्रिय घटकों का प्रदर्शन मानक

भाग 2 प्रकाशिक तंतु श्रेणी यू के लिए एकल मोड़ फाइबर पर समाप्त कनेक्टर्स

अनुभाग 1 अनियंत्रित परिवेश

Fibre Optic Interconnecting Devices and Passive Components Performance Standard

Part 2 Fibre Optic Connectors Terminated on Single-Mode Fibre for Category U

Section 1 Uncontrolled environment

ICS 33.180.20

भारतीय मानक ब्यूरो
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May 2019 **Price Group 7**

Fibre Optics, Fibres, Cables and Devices Sectional Committee, LITD 11

NATIONAL FOREWORD

This Indian Standard (Part 2/Sec 1) which is identical with IEC 61753-2-1 : 2000 'Fibre optic interconnecting devices and passive components performance standard — Part 2-1: Fibre optic connectors terminated on single-mode fibre for category U — Uncontrolled environment' issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendation of the Fibre Optics, Fibres, Cables and Devices Sectional Committee and approval of the Electronics and Information Technology Division Council.

The text of IEC Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain terminology and conventions are however not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appear to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard, which is to be substituted in its place, is listed below along with its degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
IEC 60793-1-1 Optical fibres — Part 1: Generic specification — Section 1: General	IS/IEC 60793-1-1 : 2008 Optical fibres: Part 1 Generic specification, Section 1 General	Identical with IEC 60793-1-1 : 2008

The technical committee has reviewed the provisions of the following International Standards referred in this adopted standard and has decided that they are acceptable for use in conjunction with this standard:

International Standard	*Title*
IEC 61300-2-1	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-1: Tests — Vibration (sinusoidal)
IEC 61300-2-2	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-2: Tests — Mating durability
IEC 61300-2-4	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-4: Tests — Fibre/cable retention
IEC 61300-2-5	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-5: Tests — Torsion/twist
IEC 61300-2-6	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-6: Tests — Tensile strength of coupling mechanism
IEC 61300-2-7	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-7: Tests — Bending moment

(*Continued on third cover*)

Indian Standard

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS PERFORMANCE STANDARD

PART 2 FIBRE OPTIC CONNECTORS TERMINATED ON SINGLE-MODE FIBRE FOR CATEGORY U

Section 1 Uncontrolled Environment

1 Scope

This part of IEC 61753 contains the minimum requirements and severities which a single-mode connector/cable assembly must satisfy in order to be considered as meeting category U (uncontrolled environment) of IEC 61753-1, as defined in annex A of IEC 61753-1.

This standard contains optional grades of optical performance for the attenuation random mate and return loss tests.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61753. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61753 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60793-1-1, *Optical fibres – Part 1: Generic specification – Section 1: General*

IEC 61300-2-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-1: Tests – Vibration (sinusoidal)*

IEC 61300-2-2, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-2: Tests – Mating durability*

IEC 61300-2-4, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-4: Tests – Fibre/cable retention*

IEC 61300-2-5, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-5: Tests – Torsion/twist*

IEC 61300-2-6, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-6: Tests – Tensile strength of coupling mechanism*

IEC 61300-2-7, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-7: Tests – Bending moment*

IEC 61300-2-12, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-12: Tests – Impact*

IEC 61300-2-17, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-17: Tests – Cold*

IEC 61300-2-18, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-18: Tests – Dry heat – High temperature endurance*

IEC 61300-2-19, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-19: Tests – Damp heat (steady state)*

IEC 61300-2-21, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-21: Tests – Composite temperature-humidity cyclic test*

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

IEC 61300-2-27, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-27: Tests – Dust – Laminar flow*

IEC 61300-2-42, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-42: Tests – Static side load for connectors*

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

IEC 61300-3-6, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

IEC 61300-3-34, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-34: Examinations and measurements – Attenuation of random mated connectors*

3 Definitions

For the purpose of this part of IEC 61753, the following definitions apply.

3.1
loss variation

attenuation from the value measured before the commencement of the test

3.2
sample

connector set, defined as the complete set of connector components required to provide demountable coupling between one or more pairs of optical fibres

4 Tests

All test methods are in accordance with a specific IEC 61300 part.

The samples shall be terminated onto single-mode fibre as per IEC 60793-1-1, category B.1.1, in either secondary coated or reinforced cable format.

Each test defines the number of samples to be evaluated.

The connector pairs used for each test are intended to be previously unstressed new samples, but may be selected from previously used samples, if so desired.

All optical testing shall be carried out at 1 550 nm ± 30 nm, unless otherwise specified.

Change in attenuation is, for the purpose of the test, defined as peak to peak variation.

5 Test report

Fully documented test reports and supporting evidence shall be prepared and made available for inspection as evidence that the tests have been carried out and complied with.

6 Reference components

Where the test methods used within this standard require the use of reference components, they shall have characteristics as defined in annex B.

7 Performance requirements

7.1 Dimensions

Dimensions shall comply with either the appropriate IEC interface standard or with those given in appropriate manufacturers' drawings, where the IEC interface standard does not exist or cannot be used.

7.2 Sample size, sequencing and groupings

The length of cable (or fibre) on each side of the connector set should be 1,5 m minimum.

The sample sizes, sequencing and grouping to be used for the tests shall be as defined in annex A. Samples may either be new product or sourced from a previous test.

7.3 Performance details

No.	Test	Requirements	Details
1	Attenuation (reference)	≤0,50 dB 1 330 nm ± 30 nm and 1 550 nm ± 30 nm	IEC 61300-3-4 Insertion Method B Launch mode conditions: Only the fundamental mode shall propagate at the connector interface and at the detector Source stability ±0,05 dB over the measuring period or at least 1 h Source characteristics: S4 for 1 310 nm S5 for 1 550 nm Power meter: D2 Reference component: As per annex B Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions.
2a	Return loss (branching device method)	Class S ≥26 dB Class T ≥35 dB Class R ≥40 dB 1 330 nm ± 30 nm and 1 550 nm ± 30 nm	IEC 61300-3-6 Method 1 Launch fibre length: L ≥2 m Source stability: ±0,20 dB over the measuring period or at least 1 h Source spectral width: To be decided Detector sensitivity: To be decided Detector linearity: To be decided Reference components: As per annex B Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions.
2b	Return loss (OTDR method)	Class U ≥50 dB Class V ≥60 dB (mated and unmated)	IEC 61300-3-6 Method 2 Launch fibre length: L1 ≥500 m, L2 ≥6 m, L3 ≥6 m Spectral width: To be decided Pulse duration: To be decided Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions.

3	Attenuation (random mate)	Grade P Mean ≤0,35 dB Max 1,00 dB for ≥97 % of mating combinations Grade Q Mean ≤0,30 dB Max. 0,60 dB for ≥99 % of mating combinations	IEC 61300-3-34 Launch mode conditions: Only the fundamental mode shall propagate at the connector interface and at the detector Source characteristics: S5 for 1 550 nm Power meter D2 Attenuation measurements shall be made using randomly selected specimens Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions.
4	Vibration (sinusoidal)	Allowable change in attenuation: ≤0,20 dB 1 550 nm ± 30 nm Attenuation shall be measured before, during and after the test Return loss shall be measured before, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-1 Frequency range: 10 Hz to 55 Hz Endurance duration per axis: 0,5 h Number of axes: Three, orthogonal Number of sweeps: 15 Vibration amplitude: 0,75 mm Sampling interval: Optical measurement shall be at a maximum period of 2 ms Method of mounting: An adaptor shall be mounted rigidly to the mounting fixture Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions.
5	Bending moment	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm The connector may be cleaned after the test, before measurement Attenuation shall be measured before, during and after the test Return loss shall be measured before, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs. The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-7 Load: 10 N smoothly applied Point of application: 25 mm from centre line of load defined by the optical interface Sampling rate: Losses shall be measured at least once after the load has reached its maximum level and been maintained for a minimum period of 30 s Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions Recovery procedure: The connector may be cleaned after the test before final measurement.

6	Fibre/cable retention	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Attenuation shall be measured before, during and after the test Return loss shall be measured before, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-4 Magnitude and rate of application of the tensile load: 100 N ± 5 N at a speed of 5 N/s for reinforced cables 5 N ± 0,5 N at a speed of 0,5 N/s for coated fibres Point of application of tensile load: 0,3 m from the endface of the connector Duration of the test (maintaining the load): 120 s at 100 N for reinforced cable 60 s at 5 N for coated fibres Sampling rate: Losses shall be measured at least once after the load has reached its maximum level and been maintained for a minimum period of 30 s Method of mounting: The connector shall be rigidly mounted such that the load is applied to the fibre/cable retention mechanism and not to the connector coupling mechanism. Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions.
7	Torsion	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Attenuation shall be measured before, during and after the test Return loss shall be measured before, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-5 Magnitude and rate of application of the tensile load: 15 N at a speed of 1 N/s for reinforced cable 2 N at a speed of 0,1 N/s for coated fibre Point of application of tensile load: 0,2 m from the endface of the connector Duration of the test: 25 cycles ± 180° Sampling rate: Losses shall be measured at least once after the load has reached maximum level Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions Recovery procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions before final measurement.

8	Tensile strength of coupling mechanism	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Attenuation shall be measured before, during and after the test Return loss shall be measured before, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-6 Magnitude of the tensile load: 40 N ± 1 N Rate of application of the load: 2 N/s Duration of the test: 120 s Sampling rate: Losses shall be measured at least once after the load has reached its maximum level and been maintained for a minimum period of 30 s Method of mounting: An adaptor shall be mounted rigidly to the mounting fixture Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions.
9	Impact Method A	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm The connector may be cleaned after the test, before measurement Attenuation shall be measured before and after the test and shall satisfy the requirements for the specified class Return loss shall be measured before, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-12 Number of drops: 5 Drop height: 1,5 m Sampling rate: after each drop Specimen shall be unmated during drop cycles Specimen shall be non-functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions Recovery procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions before final measurement.

10	Static side load	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Attenuation shall be measured before, during and after the test and shall satisfy the requirements for the specified class Return loss shall be measured before, continuously during, and after the test The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-42 Magnitude of the tensile load: 1 N (reinforced cable) 0,2 N (buffered fibre) Point of application of the tensile load: 0,5 m from the endface of the connector Duration of the test (maintaining load): 1 h for each tensile load (reinforced cable) 5 min for each tensile load (buffered fibre) Sampling rate: 3 min maximum interval Method of mounting: An adaptor shall be mounted rigidly to the mounting fixture Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions.
11	Mating durability	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm In the event that the transient loss increases above the allowable limit, the connector may be cleaned as necessary but not more than 25 times during the course of the test (The measurement at which the cleaning takes place shall be discounted from the test results.) Attenuation shall be measured before, and after each mating during the test Return loss shall be measured before and after each mating during the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-2 Coupling mechanism to be cycled: Plug-adaptor Cycling rate: Not less than 3 s between each engagement and separation Number of cycles: 500 minimum Specimen shall be optically functioning Preconditioning procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions Recovery procedure: Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions before final measurement.

12	Cold	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Attenuation shall be measured before, at a maximum interval of 1 h, during and after the test Return loss shall be measured before, at a maximum interval of 1 h, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-17 Temperature: –25 °C Duration of exposure: 96 h Length of the cable on each side of the connector: 1,5 m minimum Specimen shall be optically functioning Preconditioning procedure: Before the test, specimens shall be maintained at room temperature for 2 h. Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions Recovery procedure: After the test, specimens shall be maintained at room temperature for 2 h. Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions before final measurement.
13	High tempera-ture endurance	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Strength of coupling mechanism (as in test 8) shall be measured on completion of test after recovery procedure Attenuation shall be measured before, after and at a maximum interval of 1 h during the test Return loss shall be measured before, at a maximum interval of 1 h during, and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-18 Temperature: +70 °C Duration of exposure: 96 h Length of the cable on each side of the connector: 1,5 m minimum Specimen shall be optically functioning Preconditioning procedure: Before the test, specimens shall be maintained at room temperature for 2 h. Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions Recovery procedure: After the test, specimens shall be maintained at room temperature for 2 h. Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions before final measurement.

14	Damp heat (steady state)	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Attenuation shall be measured before, at a maximum interval of 1 h, during and after the test Return loss shall be measured before, at a maximum interval of 1 h, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class.	IEC 61300-2-19 Temperature: +40 °C ± 2 °C Relative humidity: 93 % ± 2 % Duration of exposure: 96 h Length of the cable on each side of the connector: 1,5 m minimum Specimen shall be optically functioning Preconditioning procedure: Before the test, specimens shall be maintained at room temperature for 2 h. Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions Recovery procedure: After the test, specimens shall be maintained at room temperature for 2 h**.** Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions before final measurement.
15	Change of temperature	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Attenuation shall be measured before, at a maximum interval of 10 min, during and after the test Return loss shall be measured before, at a maximum interval of 10 min, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class.	IEC 61300-2-22 High temperature: +70 °C Low temperature: –25 °C Duration at extreme temperatures: 1 h Temperature rate of change: 1 °C/min Number of cycles: 12 Length of the cable on each side of the connector: 1,5 m minimum Specimen shall be optically functioning Preconditioning procedure: Before the test, specimens shall be maintained at room temperature for 2 h. Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions Recovery procedure: After the test, specimens shall be maintained at room temperature for 2 h. Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions before final measurement.

16	Dust	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Return loss shall be measured before and after the test at normal ambient conditions and shall satisfy the requirements for the specified class Attenuation shall be measured before and after the test at normal ambient conditions The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 61300-2-27 Dust particle size: d < 150 µm Dust type: talc Dust concentration: 10,6 g/m^3 ± 7 g/m^3 Temperature: +35 °C Relative humidity: 60 % Duration of test: 10 min Configuration: The configuration shall be a mated pair of connectors which once mated for the initial measurements shall not be disconnected until after the completion of the test Specimen shall be optically functioning Preconditioning procedure Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions, prior to initial measurement.
17	Damp heat cyclic	Allowable change in attenuation: ≤0,20 dB at 1 550 nm ± 30 nm Attenuation shall be measured before, at a maximum interval of 10 min, during and after the test Return loss shall be measured before, at a maximum interval of 10 min, during and after the test and shall satisfy the requirements for the specified class The change in attenuation measurement shall be made against randomly selected plugs The initial attenuation shall satisfy the requirements for the specified class	IEC 60068-2-30 High temperature: +55 °C Low temperature: +25 °C Humidity: >95 % Number of cycles: 4 Specimen shall be optically functioning Preconditioning procedure: Before the test, specimens shall be maintained at room temperature for 2 h. Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions Recovery procedure: After the test, specimens shall be maintained at room temperature for 2 h. Clean the mechanical and optical alignment parts of the specimen according to the manufacturer's instructions before final measurement.

Annex A
(normative)

Sample size, sequencing and grouping requirements

	Test	Sample size	Source	Group with
1	Attenuation	10	New	
2a	Return loss (coupler method)	10	Test 1	
2b	Return loss (OTDR method)	10	Test 1	
3	Attenuation (random mate)	20	New	
4	Vibration	5	New	
5	Bending moment	5	New	
6	Fibre / cable retention	5	New	
7	Cable torsion	5	New	
8	Tensile strength of coupling mechanism	5	Test 13	
9	Impact (method A)	5	New	
10	Static side load	5	New	
11	Mating durability	5	New	
12	Cold	5	New	
13	High temperature endurance	5	New	
14	Damp heat (steady state)	5	New	
15	Change of temperature	5	New	
16	Dust	5	New	
17	Damp heat, cyclic	5	New	

The above tests are each intended to be performed individually on a product sourced as defined, although a product from a previous test may be used, if desired.

The tests may also be performed in any order, provided that the product is sourced as defined.

Annex B
(normative)

Reference components

Reference components used for this standard shall have the following characteristics:

a) They shall be of the same family type and endface configuration as those being tested.
b) They shall be terminated with the same fibre as that of the product being tested.
c) The concentricity of the fibre core shall be better than 0,6 μm.
d) They exhibit an insertion loss between the reference components of better than 0,20 dB.
e) Reference adaptors shall give 0,20 dB when used with two reference plugs.
f) They exhibit a return loss between the reference components of:
   1) for class S ≥26 dB;
   2) for class T ≥35 dB;
   3) for class R ≥40 dB;
   4) for class U ≥50 dB;
   5) for class V ≥60 dB.

(*Continued from second cover*)

IEC 61300-2-12	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-12: Tests — Impact
IEC 61300-2-17	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-17: Tests — Cold
IEC 61300-2-18	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-18: Tests — Dry heat — High temperature endurance
IEC 61300-2-19	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-19: Tests — Damp heat (steady state)
IEC 61300-2-21	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-21: Tests — Composite temperature-humidity cyclic test
IEC 61300-2-22	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-22: Tests — Change of temperature
IEC 61300-2-27	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-27: Tests — Dust — Laminar flow
IEC 61300-2-42	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-42: Tests — Static side load for connectors
IEC 61300-3-4	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-4: Examination and measurements — Attenuation
IEC 61300-3-6	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-6: Examinations and measurements — Return loss
IEC 61300-3-34	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-34: Examinations and measurements — Attenuation of random mated connectors

Only the English language text of the IEC Standard has been retained while adopting it as an Indian Standard, and as such the page numbers given here are not the same as in the IEC Standard.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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