

INTERNATIONAL STANDARD

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QC 910004XX0004

First edition
1997-06

Connectors for optical fibres and cables –
Part 14-4:
Detail specification for fibre optic adaptor
(simplex) type SC for multimode fibre

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Reference number
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- IEC 60878: *Graphical symbols for electromedical equipment in medical practice*.

The symbols and signs contained in the present publication have either been taken from IEC 60027, IEC 60417, IEC 60617 and/or IEC 60878, or have been specifically approved for the purpose of this publication.

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONNECTORS FOR OPTICAL FIBRES AND CABLES –

Part 14-4: Detail specification for fibre optic adaptor (simplex) type SC for multimode fibre

FOREWORD

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International Standard IEC 60874-14-4 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

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

| FDIS | Report on voting |
|--------------|------------------|
| 86B/874/FDIS | 86B/1003/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.

The QC number that appears on the front cover of this publication is the specification number in the IEC Quality Assessment System for Electronic Components (IECQ).

The references to clauses or subclauses of IEC 60874-1 indicated in this part apply to the third edition of IEC 60874-1.

CONNECTORS FOR OPTICAL FIBRES AND CABLES**Part 14-4: Detail specification for fibre optic adaptor (simplex) type SC for multimode fibre**

NATIONAL STANDARDS ORGANIZATION:

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Date:

DETAIL SPECIFICATION IEC QC 910004XX0004.

FIBRE OPTIC COMPONENT OF ASSESSED QUALITY IN ACCORDANCE WITH

- GENERIC SPECIFICATION: QC 910000 (IEC 60874-1)
- BLANK DETAIL SPECIFICATION: QC 910001 (IEC 60874-1-1)

FIBRE OPTIC ADAPTOR

CLASSIFICATION:

Type: Name: SC

For use in datacom applications as specified in ISO/IEC International Standard 11801:
"Generic cabling for customer premises"

Configuration: plug-adaptor-plug

Coupling: push-pull

Control dimensions:

- Plug: see figures 1, 2 and 3
- Gauge: see figure 4

Variants: see page 8

Climatic category: 10/60/4

Environmental category: 4

Assessment level: A

QUALIFICATION PROCEDURE: Fixed sample procedure

SAFETY WARNING: Take care when handling small diameter optical fibre to prevent puncturing the skin, especially in the eye area. Direct viewing of the end of an optical fibre when it is propagating energy is not recommended unless prior assurance is obtained as to the safe energy output level.

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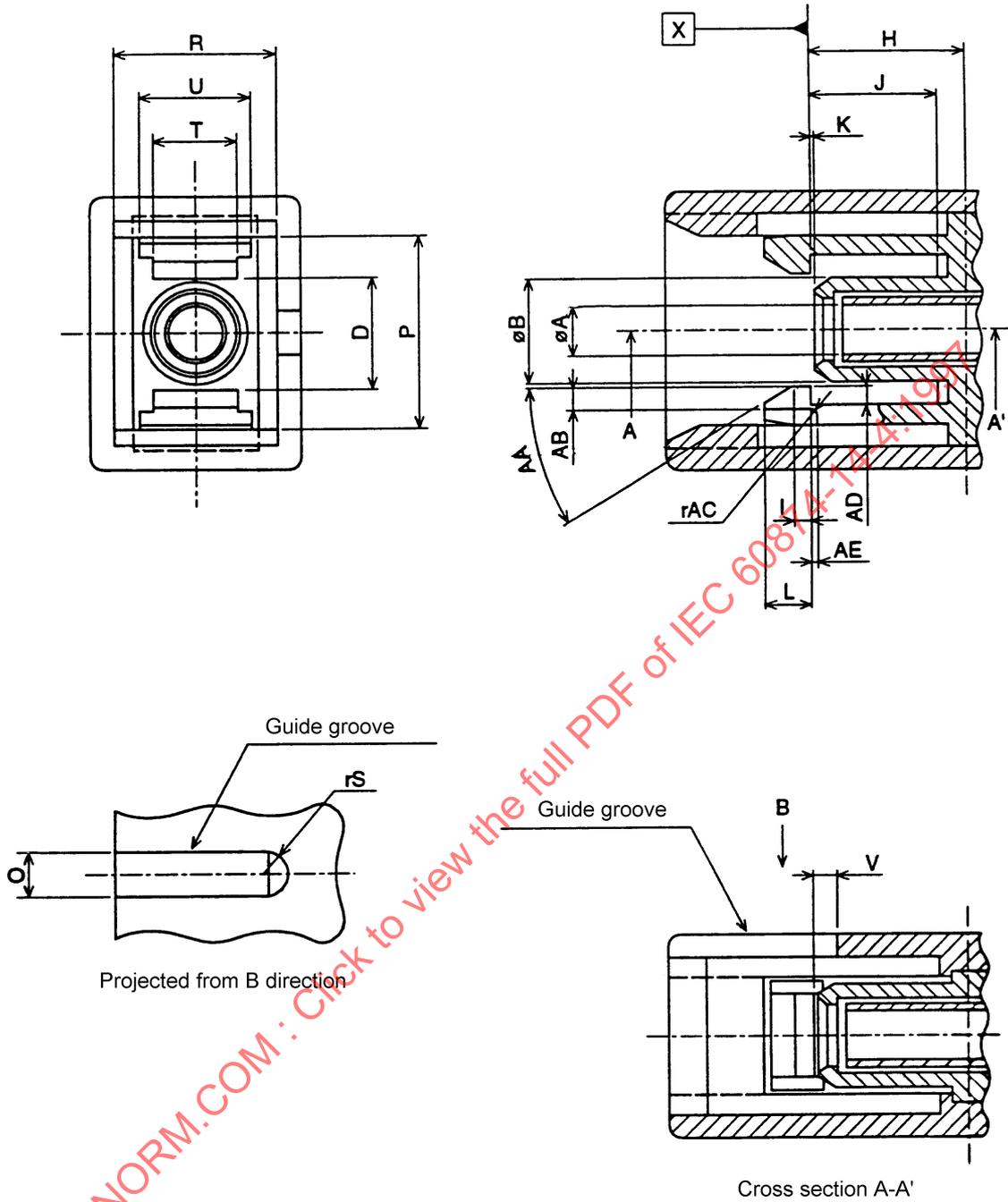


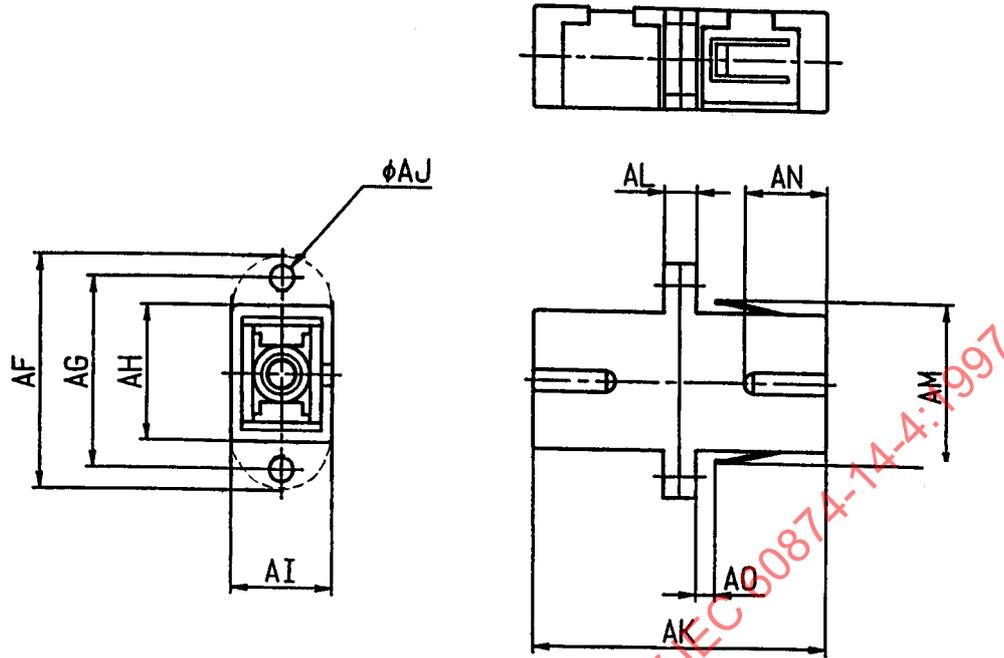
Figure 1 – Adaptor mating face dimensions

| Reference | Dimensions | | Notes |
|-----------|------------|---------|--------|
| | Minimum | Maximum | |
| A | – | – | 1 |
| B | 4,69 mm | 4,79 mm | |
| D | 4,9 mm | 5,5 mm | |
| H | 6,9 mm | 7,1 mm | |
| I | 0,4 mm | 0,8 mm | |
| J | 5,51 mm | 5,9 mm | |
| K | 0,06 mm | 1 mm | |
| L | 1,9 mm | 2,1 mm | |
| O | 2,0 mm | 2,2 mm | |
| P | 9,0 mm | 9,1 mm | |
| R | 7,4 mm | 7,5 mm | |
| rS | 1,0 mm | 1,1 mm | radius |
| T | 3,80 mm | 4,04 mm | |
| U | 5,0 mm | 5,3 mm | |
| V | 0,6 mm | 1,6 mm | |
| AA | 27° | 33° | |
| AB | 0,9 mm | 1,0 mm | |
| rAC | 0,4 mm | 0,6 mm | radius |
| AD | 0,7 mm | 0,8 mm | |
| AE | 0,4 mm | 0,6 mm | |

NOTES

- 1 The connector alignment feature is an alignment sleeve. The gauge retention force shall be measured with two gauge pins, each inserted to the middle of the alignment feature. The gauge retention force shall be from 2,0 N to 5,9 N.
- 2 Where a tolerance of form is not specified, the limits of the dimensions for a feature control the form as well as the size.
- 3 Where interrelated features of size (features shown with a common axis or centre plane) have no geometric tolerance of location or run out specified, the limits of the dimensions for a feature control the location tolerance as well as the size.
- 4 Where perpendicular features (features shown at right angles) have no geometric tolerance of orientation or run out specified, the limits of the dimensions for a feature control the orientation tolerance as well as the size.

Figure 1 – Adaptor mating face dimensions (continued)

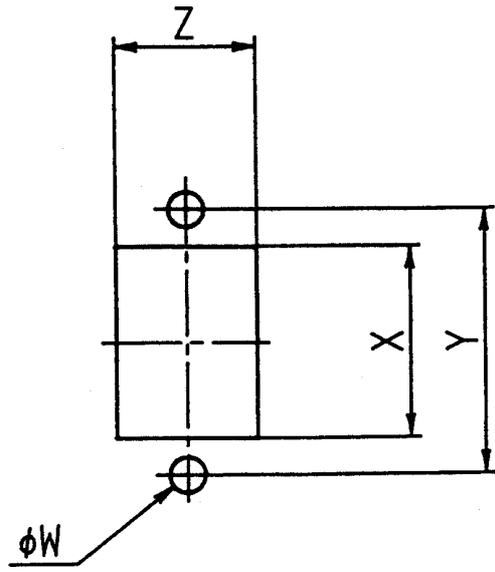


| Reference | Dimensions mm | | Notes |
|-----------|------------------|---------|-------|
| | Minimum | Maximum | |
| AF | 21,5 | 22,5 | 1 |
| AG | 17,5 | 18,5 | |
| AH | 12,6 | 13,0 | |
| AI | 9,2 | 9,4 | 1 |
| AJ | 2,2 | 2,5 | |
| AK | 27 | 27,8 | |
| AL | 2,8 | 3,2 | |
| AM | 14,4 | 16,4 | |
| AN | 7,7 | 8,0 | |
| AO | 1,7 | 2,0 | 2 |

NOTES

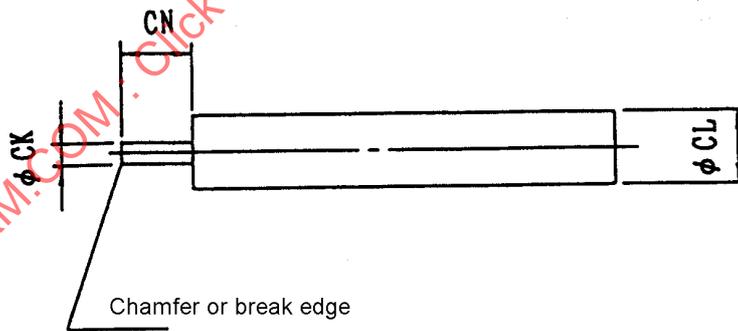
- 1 The dotted lines indicate an example of the shape of the mounting flange. The largest portion of the mounting flange shall be within these dimensions.
- 2 If the adaptor is mounted using this hook, the thickness of the panel shall be 1,6 mm.

Figure 2 – Adaptor dimensions



| Reference | Dimensions mm | | Notes |
|-----------|---------------|---------|-------|
| | Minimum | Maximum | |
| W | 2,4 | 2,6 | |
| X | 13,1 | 13,6 | |
| Y | 17,9 | 18,1 | |
| Z | 9,5 | 10,0 | |

Figure 3 – Panel piercing and mounting detail



| Reference | Dimensions mm | | Notes |
|-----------|---------------|---------|-------|
| | Minimum | Maximum | |
| CK | 2,4985 | 2,4995 | 1 |
| CL | 2,8 | 4,8 | |
| CN | 7 | 15 | |

NOTE
1 Surface roughness grade N4 (0,2 μm Ra).

Figure 4 – Dimension of a pin gauge for an adaptor

| VARIANT IDENTIFICATION NUMBERS | | | | |
|--------------------------------|----------------|-----------------------|-----------------|------------------------------------|
| Number: QC 910X01/0004-ZZZZ | | | | |
| ZZZZ | Component name | Variant feature | | |
| | | Housing part material | Sleeve material | Preferred housing colour/indicator |
| 1001 | Adaptor MMF | Plastic | Zirconia | Beige |
| 1002 | Adaptor MMF | Plastic | Phosphor bronze | Beige |
| 1003 | Adaptor MMF | Metal | Zirconia | Beige |
| 1004 | Adaptor MMF | Metal | Phosphor bronze | Beige |

SUPPLEMENTARY INFORMATION

Colour:
 1. For MMF: Beige according to RAL 1013.

Component marking:
 The name and/or manufacturer's identification mark may be permanently identified. Figure 5 shows an example of the location of component marking

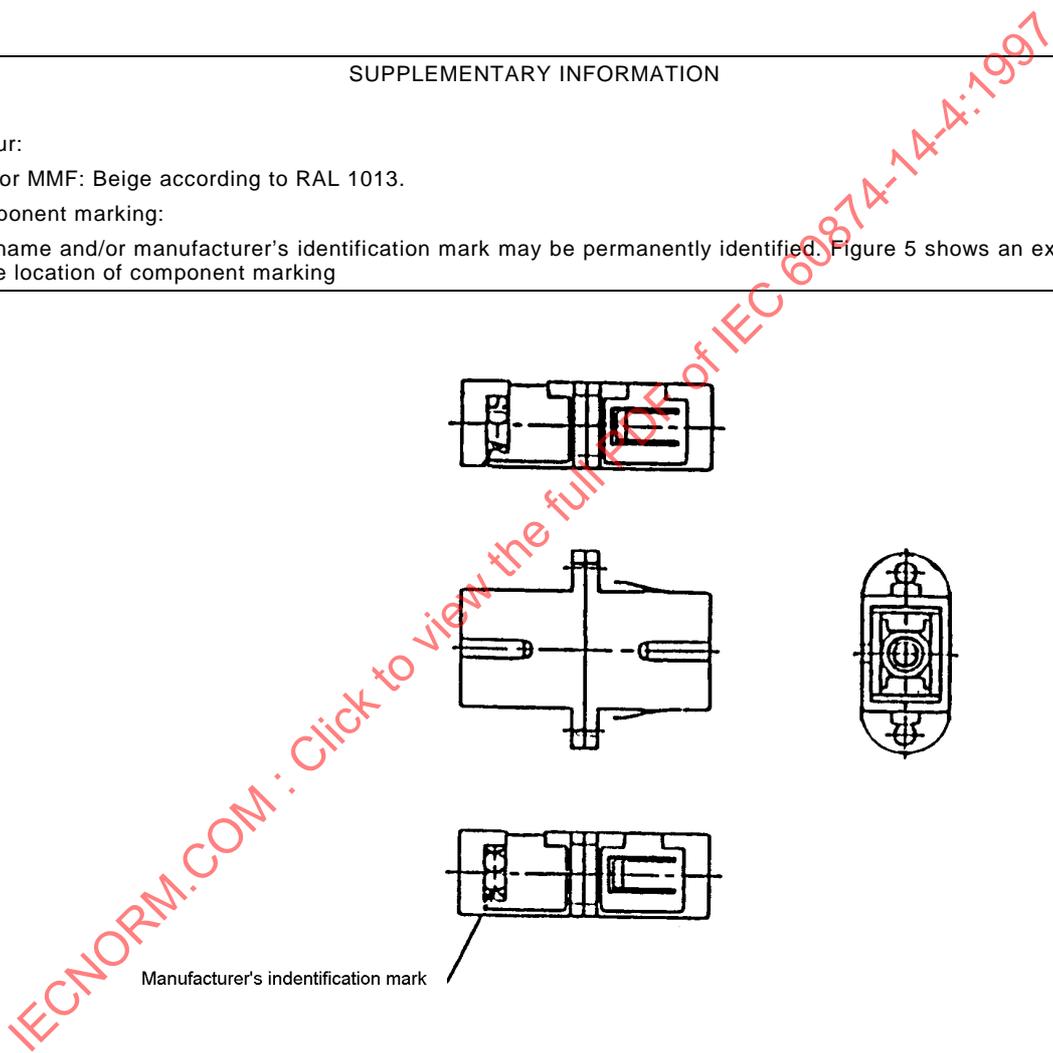


Figure 5 – Example of component marking

| TABLE 1 FIXED SAMPLE TEST SCHEDULE FOR QUALIFICATION APPROVAL | | |
|--|---|----------|
| Test sequence | Reference IEC 60874-1 (IEC 61300) | <i>n</i> |
| Group 0 – Visual examination – Dimensions – Gauge retention force | 4.4.1 (3-1) 4.4.2 (3-1) (3-33) | 20 |
| Group 1 – Attenuation | 4.4.7 (3-4) | 20 |
| Group 2 – Cold – Dry heat – Damp heat (steady state) | 4.5.17 (2-17) 4.5.18 (2-18) 4.5.19 (2-19) | 6 |
| Group 3 – Engagement and separation force – Mechanical endurance | 4.4.5 (3-11) 4.5.32 (2-2) | 6 |
| Group 4 – Vibration – Change of temperature (test Nb) | 4.5.1 (2-1) 4.5.22 (2-22) | 4 |
| Group 5 – Strength of coupling mechanism | 4.5.6 (2-6) | 4 |
| <p>NOTES</p> <p>1 <i>n</i> = sample size (number of plugs).</p> <p>2 To satisfy the qualification approval requirements of the detail specification there shall be no failures of any in the sample groups for any test parameter. If a failure does occur this shall be investigated and the cause of failure identified and corrected. The test which is affected shall then be repeated using the minimum sample size stated in this detail specification.</p> <p>A fully documented test report and supporting data shall be prepared and shall be available for inspection. Failures and the corrective action taken to eliminate failures shall be documented and evidence shall be presented to show that the corrective action will have no detrimental effect on the performance in any of the other tests. Design changes, as opposed to improvements in quality control, will usually be deemed to necessitate a repeat of the full qualification programme.</p> <p>3 Unless otherwise indicated, the test details, measurements and performance requirements are given in table 4.</p> <p>4 Only group 1 tests shall be carried out using a reference connector. All other tests shall be carried out using the samples from the relevant group at random.</p> | | |

| TABLE 2 | | | |
|--|--------------------------------------|-----------------------|-----|
| LOT-BY-LOT QUALITY CONFORMANCE INSPECTION SCHEDULE | | | |
| GROUPS A AND B | | | |
| Test sequence | Reference IEC 60874-1 (IEC 61300) | Assessment level A | |
| | | IL | AQL |
| Group A | | | |
| - Visual examination | 4.4.1 (3-1) | II | 4 % |
| - Gauge retention force | 4.4.2 (3-33) | | |
| Group B | | | |
| - Attenuation | 4.4.7 (3-4) | II | 4 % |
| <p>NOTES</p> <p>1 Unless otherwise indicated, the details, measurements and performance requirements are given in table 4.</p> <p>2 IL = Inspection level; AQL = Acceptable quality level.</p> <p>3 Only group B tests shall be carried out using a reference connector. All other tests shall be carried out using the samples from the relevant group at random.</p> | | | |

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| TABLE 3 | | | |
|--|---|-----------------------|----------|
| PERIODIC QUALITY CONFORMANCE INSPECTION SCHEDULE | | | |
| GROUPS C AND D | | | |
| Test sequence | Reference IEC 60874-1 (IEC 61300) | Assessment level A | |
| | | <i>n</i> | <i>p</i> |
| Group C0 – Visual examination – Dimensions – Gauge retention force | 4.4.1 (3-1) 4.4.2 (3-1) (3-33) | 18 | 24 |
| Group C1 – Attenuation | 4.4.7 (3-4) | 18 | 24 |
| Group C2 – Cold – Dry heat – Damp heat (steady state) | 4.5.17 (2-17) 4.5.18 (2-18) 4.5.19 (2-19) | 6 | 24 |
| Group D0 – Visual examination – Dimensions – Gauge retention force | 4.4.1 (3-1) 4.4.2 (3-1) (3-33) | 20 | 48 |
| Group D1 – Attenuation | 4.4.7 (3-4) | 20 | 48 |
| Group D2 – Cold – Dry heat – Damp heat (steady state) | 4.5.17 (2-17) 4.5.18 (2-18) 4.5.19 (2-19) | 6 | 48 |
| Group D3 – Engagement and separation force – Mechanical endurance | 4.4.5 (3-11) 4.5.2 (2-2) | 6 | 48 |
| Group D4 – Vibration – Change of temperature (test Nb) | 4.5.1 (2-1) 4.5.22 (2-22) | 4 | 48 |
| Group D5 – Strength of coupling mechanism | 4.5.6 (2-6) | 4 | 48 |
| NOTES | | | |
| 1 Unless otherwise indicated, the details, measurements and performance requirements are given in table 4. | | | |
| 2 To satisfy the qualification approval requirements of the detail specification there shall be no failures of any in the sample groups for any test parameter. If a failure does occur this shall be investigated and the cause of failure identified and corrected. The test which is affected shall then be repeated using the minimum sample size stated in this detail specification. | | | |
| A fully documented test report and supporting data shall be prepared and shall be available for inspection. Failures and the corrective action taken to eliminate failures shall be documented and evidence shall be presented to show that the corrective action will have no detrimental effect on the performance in any of the other tests. Design changes, as opposed to improvements in quality control, will usually be deemed to necessitate a repeat of the full qualification programme. | | | |
| 3 <i>n</i> = sample size (number of plugs); <i>p</i> = periodicity in months. | | | |
| 4 Only group C1 and D1 tests shall be carried out using a reference connector. All other tests shall be carried out using the samples from the relevant group at random. | | | |

| TABLE 4 DETAILS, MEASUREMENTS AND PERFORMANCE REQUIREMENTS |
|--|
| <p><i>Visual examination</i> 4.4.1 (61300-3-1)</p> <p>Requirements:</p> <ul style="list-style-type: none"> - Marking shall be clear |
| <p><i>Dimensions</i> 4.4.2 (61300-3-1)</p> <p>Requirements:</p> <ul style="list-style-type: none"> - All size dimensions shall be in accordance with this specification |
| <p><i>Attenuation</i> 4.4.7 (61300-3-4)</p> <p>Details:</p> <ul style="list-style-type: none"> - Method No. 8 - Definitions of reference components are as follows. <p><u>Reference plug</u></p> <ul style="list-style-type: none"> • Reference plug shall be in accordance with IEC 60874-14-1 <p><u>Reference adaptor</u></p> <ul style="list-style-type: none"> • The reference adaptor is a selected low-loss adaptor. The selection criterion that must be met is: using two reference plugs and the adaptor, 10 repeated measurements of attenuation with direction insertion of the plugs alternated between measurements will give a maximum attenuation less than 0,1 dB - Number of measurements to be averaged: 5 - Source: LED - Peak wavelength: 1,3 μm - Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint free material - Recovery procedure: none - Length L1: 2 m - Length L2: 2 m <p>Requirements:</p> <ul style="list-style-type: none"> - Allowable attenuation: less than 0,2 dB against two reference plugs |
| <p><i>Cold</i> 4.5.17 (61300-2-17)</p> <p>Details:</p> <ul style="list-style-type: none"> - Temperature: $-10\text{ }^{\circ}\text{C}$ - Duration: 96 h - Specimen optically functioning - Conditioning procedure: specimen lowered to test temperature and returned to room temperature at a rate not to exceed $1^{\circ}/\text{min}$ - Deviations: none - Plug shall be in accordance with IEC 60874-14-1 - Monitoring method of attenuation and return loss shall be in accordance with IEC 61300-3-20 - Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint free material - Recovery procedure: after tests, specimens shall be maintained at room temperature condition for 2 h. Clean ferrule endface and inside of alignment sleeve using lint free material before final measurement <p>Initial measurements and performance requirements:</p> <ul style="list-style-type: none"> - Attenuation: less than 0,75 dB <p>Measurements and performance requirements during test:</p> <ul style="list-style-type: none"> - Attenuation: less than 0,75 dB - Change in attenuation: less than 0,2 dB <p>Final measurements and performance requirements:</p> <ul style="list-style-type: none"> - Attenuation: less than 0,75 dB - Change in attenuation: less than 0,2 dB |

(continued)