

# INTERNATIONAL STANDARD

**IEC**  
**60874-14-10**

QC 910004XX00010

First edition  
1999-09

---

---

## **Connectors for optical fibres and cables –**

### **Part 14-10:**

**Fibre optic pigtail or patch cord connector  
type SC-APC untuned 8° terminated on  
single mode fibre type B1 –**

**Detail specification**

*Connecteurs pour fibres et câbles optiques –*

*Partie 14-10:*

*Connecteur pour fibre amorce ou pour câble de liaison,  
de type APC 8° (non réglé) terminé sur une fibre monomodale  
de type B1 – Spécification particulière*



Reference number  
IEC 60874-14-10:1999(E)

## Numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series.

## Consolidated publications

Consolidated versions of some IEC publications including amendments are available. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

## Validity of this publication

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology.

Information relating to the date of the reconfirmation of the publication is available in the IEC catalogue.

Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is to be found at the following IEC sources:

- **IEC web site\***
- **Catalogue of IEC publications**  
Published yearly with regular updates  
(On-line catalogue)\*
- **IEC Bulletin**  
Available both at the IEC web site\* and as a printed periodical

## Terminology, graphical and letter symbols

For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV).

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams*.

\* See web site address on title page.

# INTERNATIONAL STANDARD

# IEC 60874-14-10

QC 910004XX0010

First edition  
1999-09

---

---

## Connectors for optical fibres and cables –

### Part 14-10:

**Fibre optic pigtail or patch cord connector  
type SC-APC untuned 8° terminated on  
single mode fibre type B1 –**

**Detail specification**

## *Connecteurs pour fibres et câbles optiques –*

### *Partie 14-10:*

*Connecteur pour fibre amorce ou pour câble de liaison,  
de type APC 8° (non réglé) terminé sur une fibre monomodale  
de type B1 – Spécification particulière*

© IEC 1999 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission

Telefax: +41 22 919 0300

3, rue de Varembeé Geneva, Switzerland

e-mail: [inmail@iec.ch](mailto:inmail@iec.ch)

IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

PRICE CODE

**R**

*For price, see current catalogue*

# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## CONNECTORS FOR OPTICAL FIBRES AND CABLES –

### Part 14-10: Fibre optic pigtail or patch cord connector type SC-APC untuned 8° terminated on single mode fibre type B1 –

#### Detail specification

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights.

International Standard IEC 60874-14-10 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/1224/FDIS	86B/1260/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 not been drafted in complete accordance with the ISO/IEC Directives, Part 3.

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.

The committee has decided that the contents of this publication will remain unchanged until 2012. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

A bilingual version of this standard may be issued at a later date.

# CONNECTORS FOR OPTICAL FIBRES AND CABLES

## Part 14-10: Fibre optic pigtail or patch cord connector type SC-APC untuned 8° terminated on single mode fibre type B1 – Detail specification

**NATIONAL STANDARDS ORGANIZATION:**

.....  
**Date** .....

DETAIL SPECIFICATION IEC QC 910004XX00010  
FIBRE OPTIC COMPONENT OF ASSESSED QUALITY IN ACCORDANCE WITH

- GENERIC SPECIFICATION: QC 910000 (IEC 60874-1)
- BLANK DETAIL SPECIFICATION: QC 910004 (IEC 60874-1-1)

CONNECTOR SET FOR OPTICAL FIBRES AND CABLES

### CLASSIFICATION:

Type: Name: SC/APC 8° angle (untuned)  
Configuration: plug-adaptor-plug  
Coupling: push-pull  
Control dimensions:  
– Plug: see figures 1, 2, 3 and 4  
– Adaptor: see IEC 60874-14-3

Arrangement: patch cord arrangement

Style: Fibre retention: as required  
Cable retention: as required  
Optical coupling: butting  
Alignment: resilient sleeve alignment

Variants: see page 10

Climatic category: 10/60/4

Environmental category: 4

Assessment level: A

QUALIFICATION PROCEDURE: Fixed sample procedure

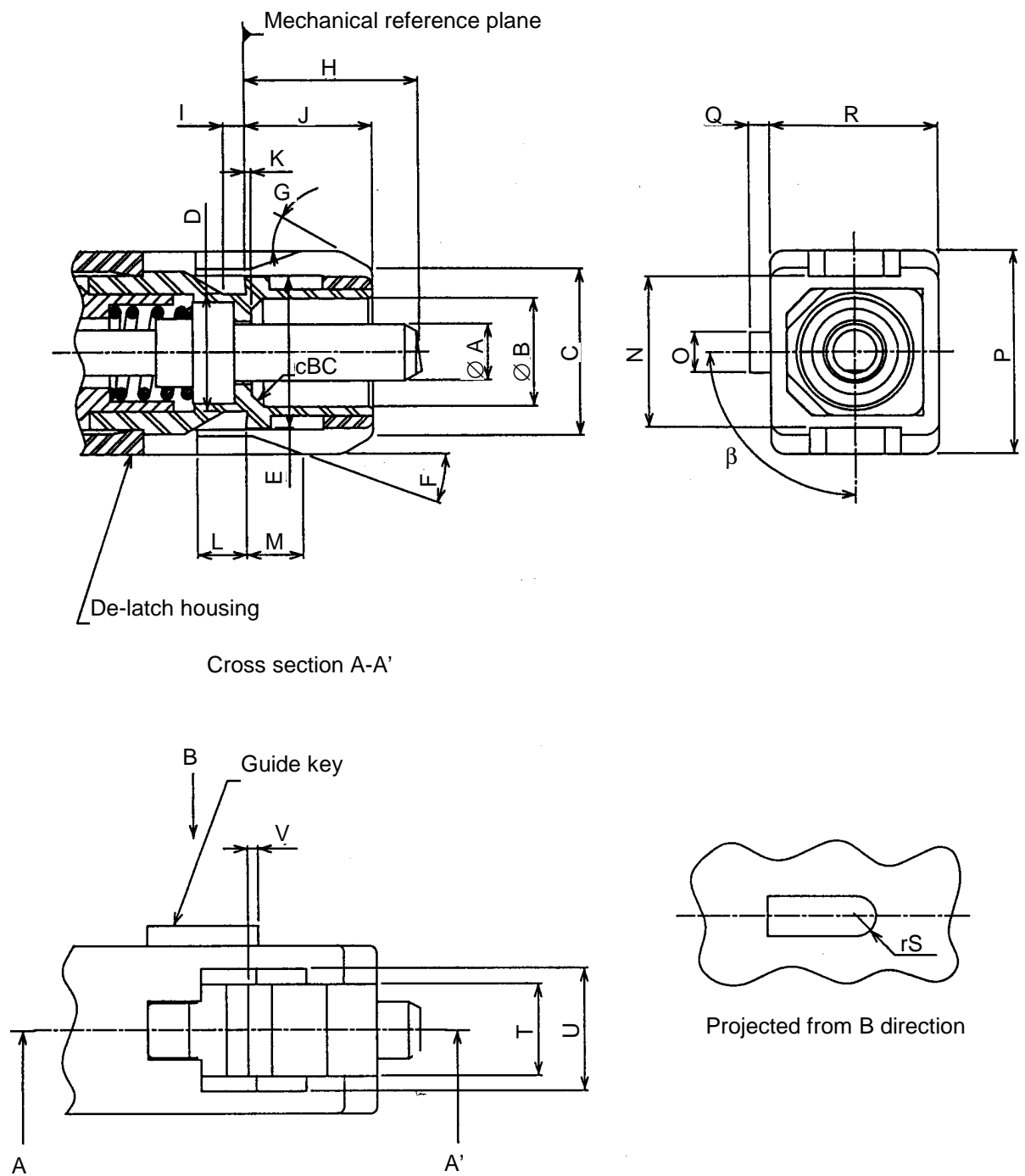
**SAFETY WARNING:** Take care when handling small diameter optical fibre to prevent puncturing the skin, especially in the eye area. Direct viewing of the end of an optical fibre when it is propagating energy is not recommended unless prior assurance is obtained as to the safe energy output level.

### Applicable fibre cable information

Mode field diameter	In accordance with IEC 60793-2
Cladding diameter	In accordance with IEC 60793-2
Core/cladding concentricity error	In accordance with IEC 60793-2
Buffer diameter	(250 ± 15) µm, (500 ± 30) µm, (900 ± 50) µm
Jacket outer diameter	As required per variant
Fibre cut-off wavelength	1 100 nm – 1 280 nm

### Additional information

– Attenuation in random connection:  
less than 0,80 dB (95% probability)  
less than 0,40 dB (average)

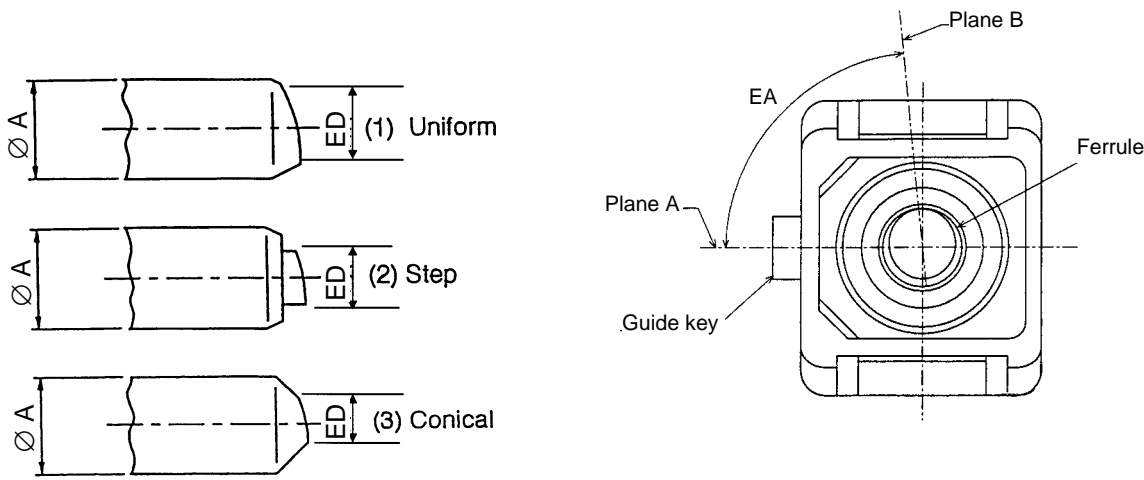


**Figure 1 – Plug mating face dimensions**

Reference	Dimensions		Notes
	Minimum	Maximum	
A	2,4985 mm	2,4995 mm	1, 2
B	4,80 mm	5,00 mm	
C	6,80 mm	7,40 mm	
D	4,90 mm	5,30 mm	
E	6,70 mm	6,80 mm	
F	19°	23°	
G	25°	35°	
H	7,15 mm	7,50 mm	
I	0,80 mm	1,20 mm	
J	5,30 mm	5,50 mm	
K	−0,10 mm	0,05 mm	
L	2,11 mm	2,50 mm	
M	2,00 mm	2,80 mm	
N	6,60 mm	6,80 mm	
O	1,60 mm	1,80 mm	
P	8,89 mm	8,99 mm	
Q	0,80 mm	1,00 mm	
R	7,29 mm	7,39 mm	
rS	0,80 mm	0,90 mm	
T	4,05 mm	4,15 mm	
U	5,40 mm	5,60 mm	
V	0 mm	0,50 mm	
cBC	0 mm	0,50 mm	Chamfer
<p><b>NOTES</b></p> <p>1 Ferrule compression force shall be from 7,8 N to 11,8 N, when the ferrule is compressed to a point where H is 7 mm ± 0,1 mm.</p> <p>2 This value shows the dimension after the ferrule is polished and in the unmated condition.</p> <p>3 Where a tolerance of form is not specified, the limits of the dimensions for a feature control the form as well as the size.</p> <p>4 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.</p> <p>5 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.</p>			

**Figure 1 – Plug mating face dimensions (concluded)**





IEC 1042/99

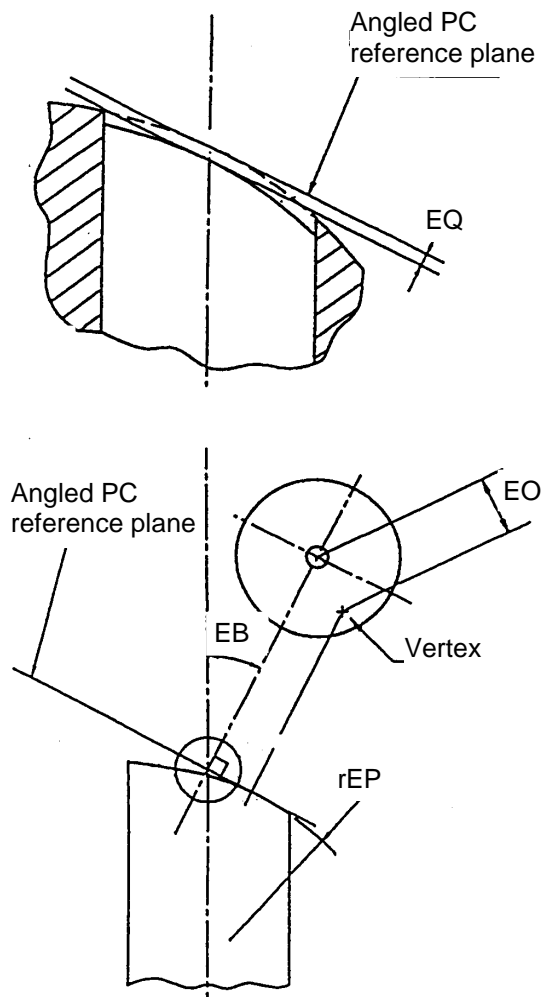
IEC 1043/99

Figure 2a – Expanded view of ferrule endface

Figure 2b – Expanded view from C direction

Reference	Dimensions			Notes
	Minimum	Nominal	Maximum	
EA		90°		1
ED	0,80 mm		1,70 mm	Diameter
NOTES				
1 The dimension EA is defined as an angle between two planes: one plane, plane A, through the axis of the ferrule and the axis of symmetry of the guide key. The other plane, plane B, passes through the axis of the ferrule and the normal to the angle PC reference plane.				
2 The shape of the ferrule end shall be one of shape (1), (2) or (3).				

Figure 2 – Ferrule endface radius and typical shape



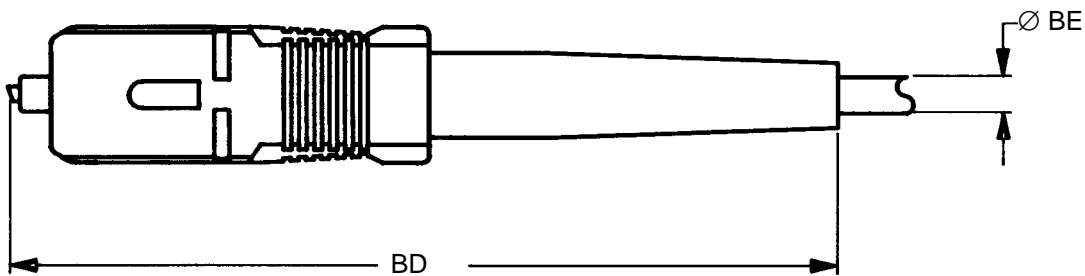
IEC 1044/99

Reference	Dimensions			Notes
	Minimum	Nominal	Maximum	
EB		8°		1
EO	0 mm		0,05 mm	2
rEP	5,00 mm		12,00 mm	3, radius
EQ	–0,0001 mm		0,0001 mm	3 and 4

**NOTES**

- 1 When used with 1 300 nm zero dispersion single-mode fibre, this range of endface angle will ensure return loss of greater than 55 dB at wavelengths of 1 310 nm or 1 550 nm even when the connector is unmated. However, when applied to *dispersion shifted fibre*, lesser return loss values in the unmated condition will be seen.
- 2 The dome eccentricity EO is defined as a distance between the ferrule centre and the vertex of the spherically polished endface relative to the angled PC reference plane. This dimension shall be measured in both extreme positions when the ferrule is rotated in the connector.
- 3 The radius and fibre undercut shall be measured in all directions over a diameter of 0,25 mm. The minimum as well as the maximum value shall be within specified limits.
- 4 The negative dimension refers to the fibre protrusion.

**Figure 3 – Ferrule endface geometry after termination**

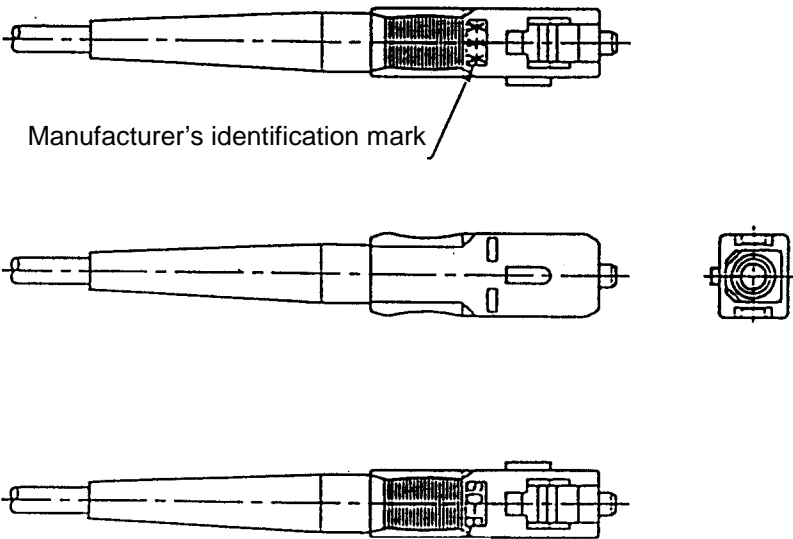


IEC 1045/99

Reference	Dimensions mm			Notes
	Minimum	Nominal	Maximum	
BD			60	
BE	2,20			1
BE	2,60			2
BE	2,90			3
BE	3,20			4
NOTES 1 This value is applicable to the variant number 1001 and 1002. 2 This value is applicable to the variant number 1003 and 1004. 3 This value is applicable to the variant number 1005 and 1006. 4 This value is applicable to the variant number 1007 and 1008.				

Figure 4 – Plug dimension

VARIANT IDENTIFICATION NUMBERS			
NUMBER: XXXXXXXXXXXXXXX			
ZZZZ	Component name	Variant feature	
		Applicable cable jacket diameter mm	Ferrule material
1001	Plug	2,00	Zirconia
1002	Plug	2,00	Metal
1003	Plug	2,40	Zirconia
1004	Plug	2,40	Metal
1005	Plug	2,70	Zirconia
1006	Plug	2,70	Metal
1007	Plug	3,00	Zirconia
1008	Plug	3,00	Metal
SUPPLEMENTARY INFORMATION			
Colour: Colour of the de-latch housing shall be green, according to RAL 6029 Colour of the coupling boot shall be green, according to RAL 6018			
Component marking: The name and/or manufacturer's identification mark may be permanently identified. Figure 5 shows an example of the location of the component marking.			



IEC 1046/99

Figure 5 – Example of component marking

<b>TABLE 1</b> <b>FIXED SAMPLE TEST SCHEDULE FOR QUALIFICATION APPROVAL</b>		
<b>Test sequence</b>	<b>Reference IEC 60874-1 (IEC QC 910000) (IEC 61300)</b>	<b><i>n</i></b>
– Group 0 – Visual examination – Dimensions – Ferrule compression force	4.4.1 (3-1) 4.4.2 (3-1) (3-22)	20
– Group 1 – Attenuation – Return loss	4.4.7 (3-4) 4.4.12 (3-6)	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 – Drop – Engagement and separation force – Mechanical endurance	4.5.14 (2-12) 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 – Cable pulling – Cable torsion	4.5.6 (2-6) 4.5.4 (2-4) 4.5.5 (2-5)	4
– Group 6 – Fibre or ferrule retention	4.5.2 (2-4)	NA
<b>NOTES</b> 1 <i>n</i> = sample size (number of plugs). 2 To satisfy the qualification approval requirements of the detail specification, there shall be no failures 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 made 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 necessitate a repeat of the full qualification programme. 3 Unless otherwise indicated, the test details, measurements and performance requirements are given in table 4. 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.		

<b>TABLE 2</b> <b>LOT-BY-LOT QUALITY CONFORMANCE INSPECTION SCHEDULE</b> <b>GROUPS A AND B</b>			
Test sequence	Reference (IEC 60874-1) IEC QC 910000 (IEC 61300)	Assessment level	
		A	
		IL	AQL
Group A – Visual examination	4.4.1 (3-1)	II	4 %
Group B – Attenuation – Return loss	4.4.7 (3-4) 4.4.12 (3-6)	II	4 %
<b>NOTES</b> 1 Unless otherwise indicated, the details, measurements and performance requirements are given in table 4. 2 IL = Inspection level; AQL = Acceptable quality level. 3 Only attenuation and return loss 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 3**  
**PERIODIC QUALITY CONFORMANCE INSPECTION SCHEDULE**  
**GROUPS C AND D**

Test sequence	Reference IEC 60874-1 (QC 910000) (IEC 61300)	Assessment level A	
		<i>n</i>	<i>p</i>
Group C0 – Visual examination – Dimensions – Ferrule compression force	4.4.1 (3-1) 4.4.2 (3-1) (3-22)	18	24
Group C1 – Attenuation – Return loss	4.4.7 (3-4) 4.4.12 (3-6)	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 – Ferrule compression force	4.4.1 (3-1) 4.4.2 (3-1) (3-22)	20	48
Group D1 – Attenuation – Return loss	4.4.7 (3-4) 4.4.12 (3-6)	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 – Drop – Engagement and separation force – Mechanical endurance	4.5.14 (2-12) 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 – Cable pulling – Cable torsion	4.5.6 (2-6) 4.5.4 (2-4) 4.5.5 (2-5)	4	48
– Group D6 – Fibre or ferrule retention	4.5.2 (2-4)	NA	NA

**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 made available for inspection. Failures and the corrective action taken to eliminate failures shall be documented and evidence 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 necessitate a repeat of the full qualification programme.

3 *n* = sample size (number of plugs);  
*p* = 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.

<p align="center"><b>TABLE 4</b></p> <p align="center"><b>DETAILS, MEASUREMENTS AND PERFORMANCE REQUIREMENTS</b></p>
<p>Visual examination 4.4.1 (61300-3-1)</p> <p>Requirements:</p> <ul style="list-style-type: none"> <li>– Marking shall be clear</li> <li>– De-latch housing shall be movable smoothly</li> </ul>
<p>Dimensions 4.4.2 (61300-3-1)</p> <p>Requirements:</p> <ul style="list-style-type: none"> <li>– All size dimensions shall be in accordance with this specification</li> </ul>
<p>Attenuation 4.4.7 (61300-3-4)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Method No. 7</li> <li>– Definitions of reference plug are as follows: <ul style="list-style-type: none"> <li>– Concentricity of the fibre core with the outer diameter of the ferrule is less than 0,6 µm</li> <li>– Eccentricity of a spherical polished ferrule endface is less than 30 µm</li> </ul> </li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> <li>– Number of measurements to be averaged: 5</li> <li>– Source: LD</li> <li>– Peak wavelength: 1,3 µm</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: none</li> </ul> <p>Requirements:</p> <ul style="list-style-type: none"> <li>– Allowable attenuation: less than 0,5 dB against reference plug using reference adaptor</li> </ul>
<p>Return loss 4.4.12 (61300-3-6)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Method 3</li> <li>– Source: LD</li> <li>– Peak wavelength: 1,3 µm</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: none</li> </ul> <p>Requirements:</p> <ul style="list-style-type: none"> <li>– Allowable return loss: more than 55 dB against reference plug using reference adaptor, with a maximum pigtail length of 2 m. Measurement equipment shall be compensated, for the Rayleigh backscatter of the fibre in the reference lead.</li> </ul>



<p style="text-align: center;"><b>TABLE 4 (continued)</b></p> <p style="text-align: center;"><b>DETAILS, MEASUREMENTS AND PERFORMANCE REQUIREMENTS</b></p>
<p><b>Cold 4.5.17 (61300-2-17)</b></p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Temperature: –10 °C</li> <li>– Duration: 96 h</li> <li>– Specimen optically functioning</li> <li>– Conditioning procedure: specimen lowered to test temperature and returned to room temperature at a rate not to exceed 1 °C/min</li> <li>– Deviations: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> <li>– Monitoring method of attenuation and return loss shall be in accordance with IEC 61300-3-30</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: after testing, specimens shall be maintained in room temperature conditions for 2 h</li> <li>– Clean ferrule endface and inside of alignment sleeve using lint-free cloth before final measurement</li> </ul> <p>Requirements:</p> <ul style="list-style-type: none"> <li>– Change in attenuation during test: less than 0,2 dB</li> <li>– Return loss during test: more than 55 dB</li> </ul>
<p><b>Dry heat 4.5.18 (61300-2-18)</b></p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Temperature: 60 °C</li> <li>– Duration: 96 h</li> <li>– Specimen optically functioning</li> <li>– Conditioning procedure: specimen raised to test temperature and returned to room temperature at a rate not to exceed 1 °C/min</li> <li>– Deviations: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> <li>– Monitoring method of attenuation and return loss shall be in accordance with IEC 61300-3-30.</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: after testing, specimens shall be maintained in room temperature conditions for 2 h</li> <li>– Clean ferrule endface and inside of alignment sleeve using lint-free cloth before final measurement</li> </ul> <p>Requirements:</p> <ul style="list-style-type: none"> <li>– Change in attenuation during test: less than 0,2 dB</li> <li>– Return loss during test: more than 55 dB</li> </ul>
<p><b>Damp heat (steady state) 4.5.19 (61300-2-19)</b></p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Temperature: 40 °C</li> <li>– Relative humidity: 90 % – 95 %</li> <li>– Duration: 4 days</li> <li>– Precautions regarding surface moisture removal: none</li> <li>– Specimen optically functioning</li> <li>– Conditioning procedure: specimen raised to test temperature and returned to room temperature at a rate not to exceed 1 °C/min</li> <li>– Deviations: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> <li>– Monitoring method of attenuation and return loss shall be in accordance with IEC 61300-3-30</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: after testing, specimens shall be maintained in room temperature condition for 2 h</li> <li>– Clean ferrule endface and inside of alignment sleeve using lint-free cloth before final measurement</li> </ul> <p>Requirements:</p> <ul style="list-style-type: none"> <li>– Change in attenuation during test: less than 0,2 dB</li> <li>– Return loss during test: more than 55 dB</li> </ul>

<p style="text-align: center;"><b>TABLE 4 (continued)</b></p> <p style="text-align: center;"><b>DETAILS, MEASUREMENTS AND PERFORMANCE REQUIREMENTS</b></p>
<p>Cable pulling 4.5.4 (61300-2-4)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Magnitude: 90 N</li> <li>– Rate of application of the tensile load: 50 N/min &lt; load rate &lt; 250 N/min</li> <li>– Point of application of the tensile load: 22 cm – 28 cm from the connector</li> <li>– Specimen optically non-functioning</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: none</li> <li>– Deviations: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> </ul> <p>Initial measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Attenuation: less than 0,75 dB</li> <li>– Return loss: more than 55 dB</li> </ul> <p>Final measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Maximum change in attenuation between initial and final measurements: less than 0,2 dB</li> <li>– Return loss: more than 55 dB</li> <li>– The specimen has no mechanical damage</li> </ul>
<p>Cable torsion 4.5.5 (61300-2-5)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Tensile load:   1,5 kg (for the variant No. 1001 and 1002)                       2,5 kg (for the variant No. 1003 and 1004)</li> <li>– Application of load: twist the cable 2,5 turns in one direction with specified load applied. Then twist it 5 turns in the other direction and back 5 turns for 5 cycles</li> <li>– Point of application of the tensile load: 22 cm – 28 cm from the connector</li> <li>– Specimen optically non-functioning</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: none</li> <li>– Deviations: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> </ul> <p>Initial measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Attenuation: less than 0,75 dB</li> <li>– Return loss: more than 55 dB</li> </ul> <p>Final measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Maximum change in attenuation between initial and final measurements: less than 0,2 dB</li> <li>– Return loss: more than 55 dB</li> <li>– The specimen has no mechanical damage</li> </ul>

<p style="text-align: center;"><b>TABLE 4 (continued)</b></p> <p style="text-align: center;"><b>DETAILS, MEASUREMENTS AND PERFORMANCE REQUIREMENTS</b></p>
<p>Strength of coupling mechanism 4.5.6 (61300-2-6)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Magnitude: 68,6 N</li> <li>– Rate of application of the tensile load: 50 N/min &lt; load rate &lt; 250 N/min</li> <li>– Point of application of the tensile load: 22 cm – 28 cm from connector</li> <li>– Specimen optically non-functioning</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth before final measurement</li> <li>– Deviations: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> </ul> <p>Initial measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Attenuation: less than 0,75 dB</li> <li>– Return loss: more than 55 dB</li> </ul> <p>Final measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Maximum change in attenuation between initial and final measurements: less than 0,2 dB</li> <li>– Return loss: more than 55 dB</li> <li>– The specimen has no mechanical damage</li> </ul>
<p>Mechanical endurance 4.5.32 (61300-2-2)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Cycles: 500</li> <li>– Specimen optically functioning</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: clean as necessary, but no more than 25 times during the course of the test</li> <li>– Deviations: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> </ul> <p>Requirements:</p> <ul style="list-style-type: none"> <li>– Change in attenuation during test: less than 0,2 dB</li> <li>– Return loss during test: more than 55 dB</li> </ul>
<p>Ferrule compression force (61300-3-22)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Position of the ferrule endface relative to mechanical reference plane of the connector while ferrule compression force shall be measured</li> </ul> <p style="padding-left: 40px;">Dimension H (see figure 1) is 7 mm ± 0,1 mm.</p> <p>Requirements:</p> <ul style="list-style-type: none"> <li>– Allowable ferrule compression force: 7,8 N – 11,8 N</li> </ul>

<p><b>TABLE 4 (continued)</b></p> <p><b>DETAILS, MEASUREMENTS AND PERFORMANCE REQUIREMENTS</b></p>	
<p>Drop 4.5.14 (61300-2-12)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Method: A</li> <li>– Number of drops: 5</li> <li>– Drop height: 1 000 mm</li> <li>– Specimen optically non-functioning</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth. The plug shall be with dust cap</li> <li>– Recovery procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth, before final measurement</li> <li>– Deviation: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> </ul> <p>Initial measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Attenuation: less than 0,75 dB</li> <li>– Return loss: more than 55 dB</li> </ul> <p>Final measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Maximum change in attenuation between initial and final measurements: less than 0,2 dB</li> <li>– Return loss: more than 55 dB</li> <li>– The specimen has no mechanical damage</li> </ul>	
<p>Engagement and separation force 4.5.4 (61300-3-11)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Preconditioning procedure: none</li> <li>– Deviation: as necessary</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> </ul> <p>Requirements</p> <ul style="list-style-type: none"> <li>– Allowable engagement force: max. 19,6 N</li> <li>– Allowable separation force: max. 19,6 N</li> </ul>	

<p style="text-align: center;"><b>TABLE 4 (concluded)</b></p> <p style="text-align: center;"><b>DETAILS, MEASUREMENTS AND PERFORMANCE REQUIREMENTS</b></p>
<p>Change of temperature (test Nb) 4.5.22 (61300-2-22)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Test method: Nb</li> <li>– High temperature: 60 °C</li> <li>– Low temperature: –10 °C</li> <li>– Duration of extreme temperature: 30 min</li> <li>– Change over time: 0,5 min</li> <li>– Number of cycles: 5</li> <li>– Specimen optically functioning</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: after testing, specimens shall be maintained in room temperature condition for 2 h Clean ferrule endface and inside of alignment sleeve using lint-free cloth before final measurement</li> <li>– Deviation: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> </ul> <p>Initial measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Attenuation: less than 0,75 dB</li> <li>– Return loss: more than 55 dB</li> </ul> <p>Measurements and performance requirements during test:</p> <ul style="list-style-type: none"> <li>– Change in attenuation: less than 0,2 dB</li> <li>– Return loss: more than 55 dB</li> </ul> <p>Final measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Attenuation: less than 0,75 dB</li> <li>– Return loss: more than 55 dB</li> </ul>
<p>Vibration 4.5.1 (61300-2-1)</p> <p>Details:</p> <ul style="list-style-type: none"> <li>– Frequency range: 10 Hz – 55 Hz</li> <li>– Vibration amplitude: 0,75 mm constant displacement</li> <li>– Sweep time: 1 octave/min</li> <li>– Endurance duration per axis: 30 min</li> <li>– Method of mounting: an adapter shall be mounted rigidly to the mounting fixture</li> <li>– Specimen optically non-functioning</li> <li>– Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth</li> <li>– Recovery procedure: clean ferrule endface and inside of alignment sleeve using lint-free cloth before final measurement</li> <li>– Deviation: none</li> <li>– Adaptor shall be in accordance with IEC 60874-14-3</li> </ul> <p>Initial measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Attenuation: less than 0,75 dB</li> <li>– Return loss: more than 55 dB</li> </ul> <p>Final measurements and performance requirements:</p> <ul style="list-style-type: none"> <li>– Maximum change in attenuation between initial and final measurements: less than 0,2 dB</li> <li>– Return loss: more than 55 dB</li> <li>– The specimen has no mechanical damage</li> </ul>





## Standards Survey

The IEC would like to offer you the best quality standards possible. To make sure that we continue to meet your needs, your feedback is essential. Would you please take a minute to answer the questions overleaf and fax them to us at +41 22 919 03 00 or mail them to the address below. Thank you!

Customer Service Centre (CSC)

**International Electrotechnical Commission**

3, rue de Varembé  
1211 Genève 20  
Switzerland

or

Fax to: **IEC/CSC** at +41 22 919 03 00

Thank you for your contribution to the standards-making process.

**A Prioritaire**

Nicht frankieren  
Ne pas affranchir



Non affrancare  
No stamp required

**RÉPONSE PAYÉE**

**SUISSE**

Customer Service Centre (CSC)  
**International Electrotechnical Commission**  
3, rue de Varembé  
1211 GENEVA 20  
Switzerland



**Q1** Please report on **ONE STANDARD** and **ONE STANDARD ONLY**. Enter the exact number of the standard: (e.g. 60601-1-1)

.....

**Q2** Please tell us in what capacity(ies) you bought the standard (tick all that apply). I am the/a:

- purchasing agent ☐  
 librarian ☐  
 researcher ☐  
 design engineer ☐  
 safety engineer ☐  
 testing engineer ☐  
 marketing specialist ☐  
 other.....

**Q3** I work for/in/as a:  
(tick all that apply)

- manufacturing ☐  
 consultant ☐  
 government ☐  
 test/certification facility ☐  
 public utility ☐  
 education ☐  
 military ☐  
 other.....

**Q4** This standard will be used for:  
(tick all that apply)

- general reference ☐  
 product research ☐  
 product design/development ☐  
 specifications ☐  
 tenders ☐  
 quality assessment ☐  
 certification ☐  
 technical documentation ☐  
 thesis ☐  
 manufacturing ☐  
 other.....

**Q5** This standard meets my needs:  
(tick one)

- not at all ☐  
 nearly ☐  
 fairly well ☐  
 exactly ☐

**Q6** If you ticked NOT AT ALL in Question 5 the reason is: (tick all that apply)

- standard is out of date ☐  
 standard is incomplete ☐  
 standard is too academic ☐  
 standard is too superficial ☐  
 title is misleading ☐  
 I made the wrong choice ☐  
 other .....

**Q7** Please assess the standard in the following categories, using the numbers:

- (1) unacceptable,  
 (2) below average,  
 (3) average,  
 (4) above average,  
 (5) exceptional,  
 (6) not applicable

- timeliness.....  
 quality of writing.....  
 technical contents.....  
 logic of arrangement of contents .....  
 tables, charts, graphs, figures.....  
 other .....

**Q8** I read/use the: (tick one)

- French text only ☐  
 English text only ☐  
 both English and French texts ☐

**Q9** Please share any comment on any aspect of the IEC that you would like us to know:

.....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....  
 .....







ISBN 2-8318-4889-X



---

ICS 33.180.20

---