

INTERNATIONAL STANDARD

IEC
60874-14-3

QC 910004XX0003

First edition
1997-06

Connectors for optical fibres and cables –

Part 14-3:

**Detail specification for fibre optic adaptor
(simplex) type SC for single-mode fibre**



Reference number
IEC 60874-14-3: 1997(E)

Validité de la présente publication

Le contenu technique des publications de la CEI est constamment revu par la CEI afin qu'il reflète l'état actuel de la technique.

Des renseignements relatifs à la date de reconfirmation de la publication sont disponibles auprès du Bureau Central de la CEI.

Les renseignements relatifs à ces révisions, à l'établissement des éditions révisées et aux amendements peuvent être obtenus auprès des Comités nationaux de la CEI et dans les documents ci-dessous:

- **Bulletin de la CEI**
- **Annuaire de la CEI**
Publié annuellement
- **Catalogue des publications de la CEI**
Publié annuellement et mis à jour régulièrement

Terminologie

En ce qui concerne la terminologie générale, le lecteur se reportera à la CEI 60050: *Vocabulaire Electrotechnique International* (VEI), qui se présente sous forme de chapitres séparés traitant chacun d'un sujet défini. Des détails complets sur le VEI peuvent être obtenus sur demande. Voir également le dictionnaire multilingue de la CEI.

Les termes et définitions figurant dans la présente publication ont été soit tirés du VEI, soit spécifiquement approuvés aux fins de cette publication.

Symboles graphiques et littéraux

Pour les symboles graphiques, les symboles littéraux et les signes d'usage général approuvés par la CEI, le lecteur consultera:

- la CEI 60027: *Symboles littéraux à utiliser en électrotechnique*;
- la CEI 60417: *Symboles graphiques utilisables sur le matériel. Index, relevé et compilation des feuilles individuelles*;
- la CEI 60617: *Symboles graphiques pour schémas*;

et pour les appareils électromédicaux,

- la CEI 60878: *Symboles graphiques pour équipements électriques en pratique médicale*.

Les symboles et signes contenus dans la présente publication ont été soit tirés de la CEI 60027, de la CEI 60417, de la CEI 60617 et/ou de la CEI 60878, soit spécifiquement approuvés aux fins de cette publication.

Publications de la CEI établies par le même comité d'études

L'attention du lecteur est attirée sur les listes figurant à la fin de cette publication, qui énumèrent les publications de la CEI préparées par le comité d'études qui a établi la présente publication.

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 from the IEC Central Office.

Information on the revision work, the issue of revised editions and amendments may be obtained from IEC National Committees and from the following IEC sources:

- **IEC Bulletin**
- **IEC Yearbook**
Published yearly
- **Catalogue of IEC publications**
Published yearly with regular updates

Terminology

For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV), which is issued in the form of separate chapters each dealing with a specific field. Full details of the IEV will be supplied on request. See also the IEC Multilingual Dictionary.

The terms and definitions contained in the present publication have either been taken from the IEV or have been specifically approved for the purpose of this publication.

Graphical and letter symbols

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*;
- IEC 60617: *Graphical symbols for diagrams*;

and for medical electrical equipment,

- 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.

IEC publications prepared by the same technical committee

The attention of readers is drawn to the end pages of this publication which list the IEC publications issued by the technical committee which has prepared the present publication.

INTERNATIONAL STANDARD

IEC
60874-14-3

QC 910004XX0003

First edition
1997-06

Connectors for optical fibres and cables – Part 14-3: Detail specification for fibre optic adaptor (simplex) type SC for single-mode fibre

© IEC 1997 Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'éditeur.

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 Varembé Geneva, Switzerland
e-mail: inmail@iec.ch IEC web site <http://www.iec.ch>



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

P

*Pour prix, voir catalogue en vigueur
For price, see current catalogue*

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONNECTORS FOR OPTICAL FIBRES AND CABLES –

**Part 14-3: Detail specification for fibre optic adaptor (simplex)
type SC for single-mode fibre**

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 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. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60784-14-3 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/873/FDIS	86B/1002/RVD

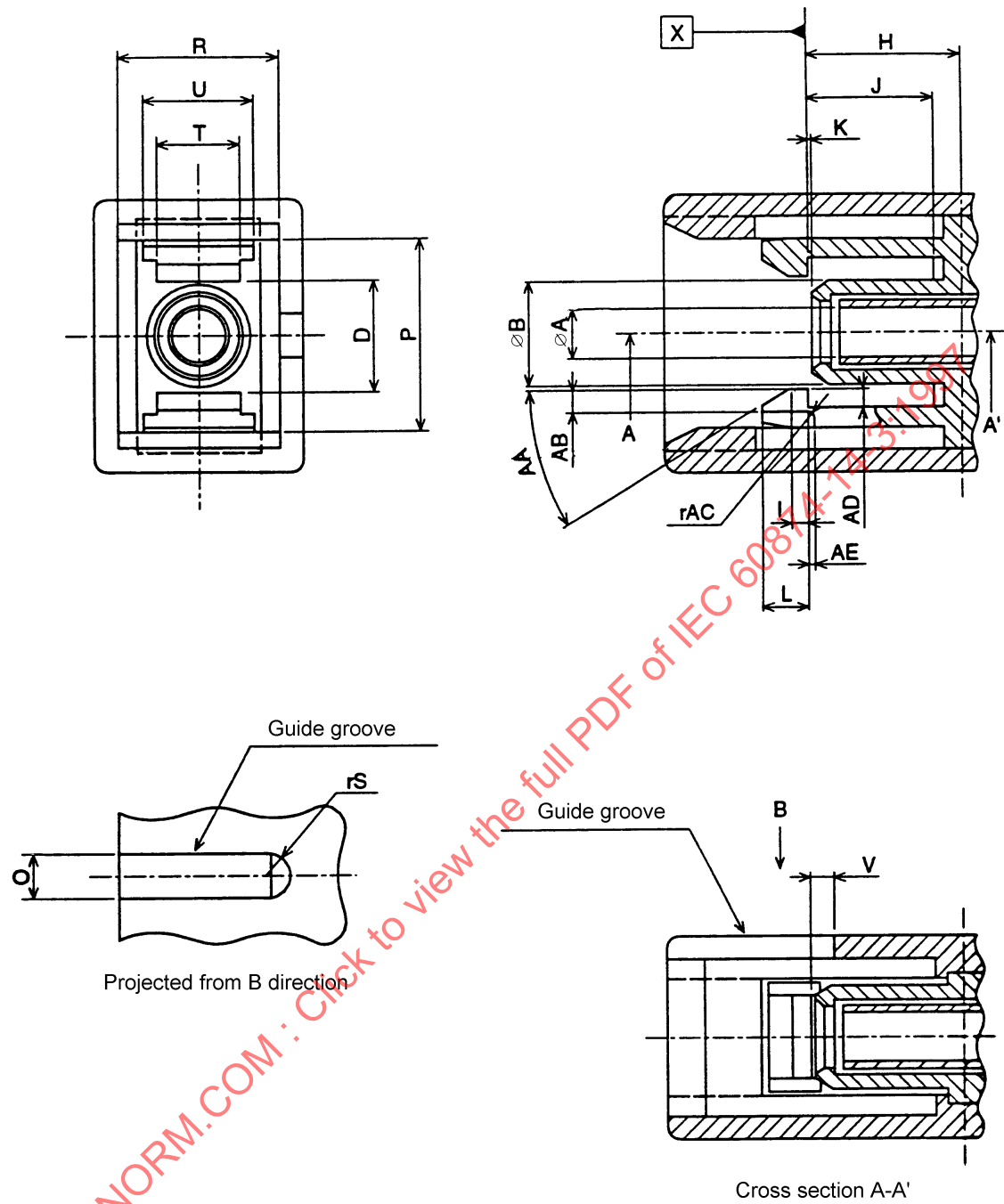
Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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- 3: Detail specification for fibre optic adaptor (simplex) type SC for single-mode fibre	
NATIONAL STANDARDS ORGANIZATION:	 Date:
DETAIL SPECIFICATION IEC QC 910004XX0003. 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 9 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.	

IECNORM.COM : Click to view the full PDF of IEC 60874-14-3:1997



IEC 653/97

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	2
rS	1,0 mm	1,1 mm	
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	
AD	0,7 mm	0,8 mm	
AE	0,4 mm	0,6 mm	

radius

degrees

radius

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.

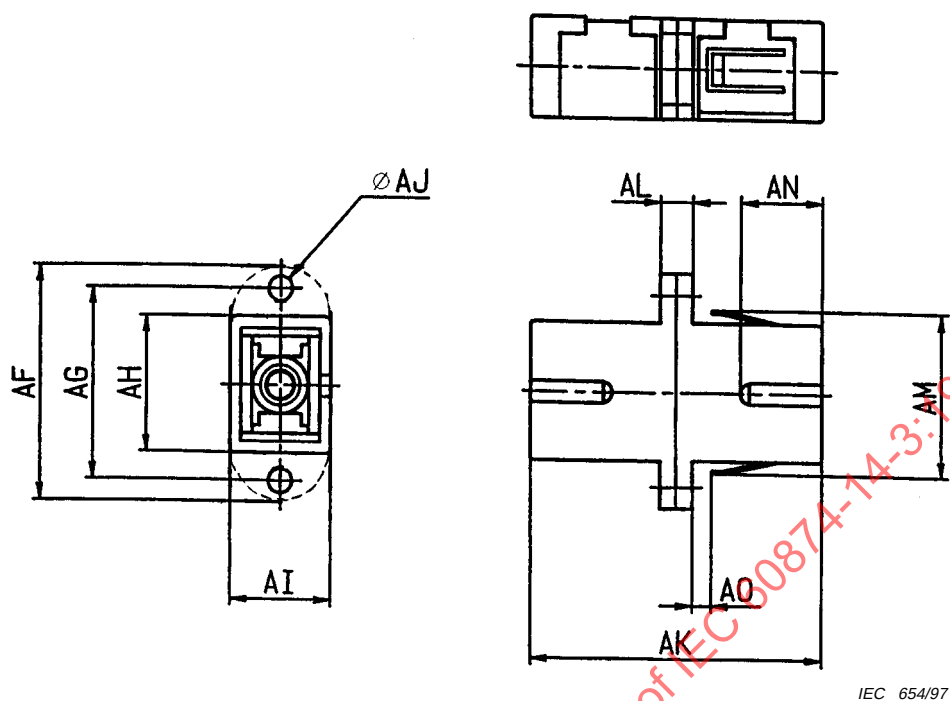
2 For the angled PC variants (Nos. 1005 to 1008) the two slots "O" shall be symmetric within $\pm 0,03$ mm.

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.

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.

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.

Figure 1 – Adaptor mating face dimensions (continued)



IEC 654/97

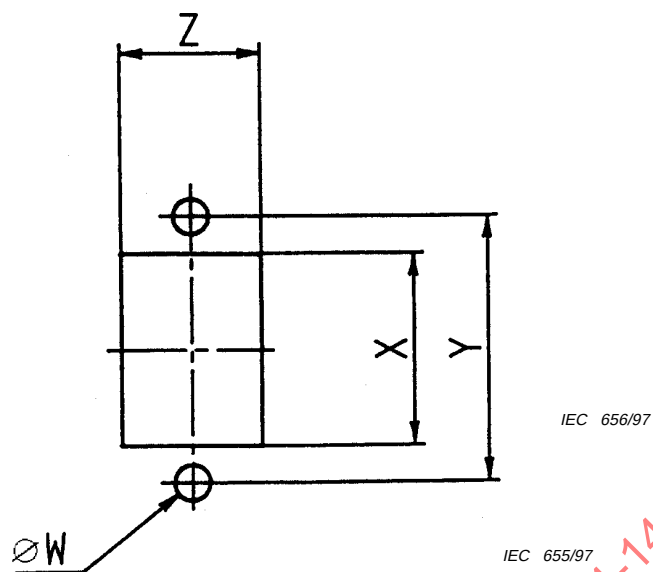
Reference	Dimensions mm		Notes
	Minimum	Maximum	
AF	21,5	22,5	1
AG	17,5	18,5	
AH	12,6	13,0	
AI	9,2	9,4	
AJ	2,2	2,5	1
AK	27,0	27,8	
AL	2,8	3,2	
AM	14,4	16,4	
AN	7,7	8,0	2
AO	1,7	2,0	

NOTES

1 The dotted lines indicate an example of the shape of the mounting flange. The mounting flange shall be within these dimensions.

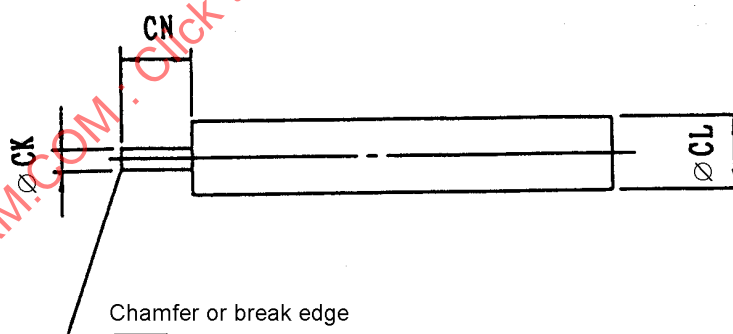
2 If the adaptor is mounted using this hook, the thickness of the panel shall be 1,6 mm.

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

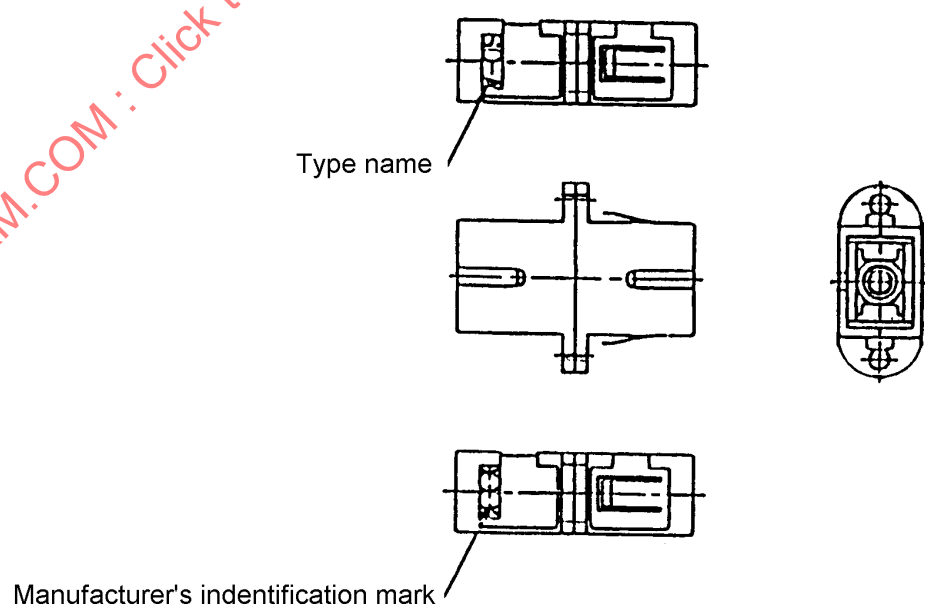


Reference	Dimensions mm		Notes
	Minimum	Maximum	
CK	2,4985	2,4995	1
CL	2,8	4,8	
CN	7	15	
NOTE			
1 Surface roughness grade N4 (0,2 μm Ra).			

Figure 4 – Dimension of a pin gauge for an adaptor

VARIANT IDENTIFICATION NUMBERS				
Number: QC 910X01/0003-ZZZZ				
ZZZZ	Component name	Variant feature		
		Housing part material	Sleeve material	Preferred housing colour/indicator
1001	Adaptor SMF	Plastic	Zirconia	Blue
1002	Adaptor SMF	Plastic	Phosphor bronze	Blue
1003	Adaptor SMF	Metal	Zirconia	Blue
1004	Adaptor SMF	Metal	Phosphor bronze	Blue
1005	Adaptor APC	Plastic	Zirconia	Green
1006	Adaptor APC	Plastic	Phosphor bronze	Green
1007	Adaptor APC	Metal	Zirconia	Green
1008	Adaptor APC	Metal	Phosphor bronze	Green

SUPPLEMENTARY INFORMATION
Preferred colour: For SMF: blue according to: RAL 5015. For APC: green according to RAL 6029 NOTE – The variants 1001, 1003, 1005 and 1007 are recommended for APC connectors 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 657/97

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
NOTES 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 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 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.		

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 %
NOTES 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 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.			

IECNORM.COM : Click to view the full PDF of IEC 60874-14-3:1997

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
<i>Visual examination</i> 4.4.1 (61300-3-1) Requirements: – Marking shall be clear
<i>Dimensions</i> 4.4.2 (61300-3-1) Gauge retention force (61300-3-33) Requirements: – All size dimensions shall be in accordance with this specification
<i>Attenuation</i> 4.4.7 (61300-3-4) Details: – Method No. 8 – Definitions of reference components are as follows: <u>Reference plug</u> Reference plug shall be in accordance with IEC 60874-14-5 (SC PC untuned) for variants 1001 to 1004 IEC 60874-14-6 (SC APC 9° untuned) IEC 60874-14-10 (SC APC 8° untuned) for variants 1005 to 1008 <u>Reference adaptor</u> 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: LD – Peak wavelength: 1,3 µm – Preconditioning procedure: clean ferrule endface and inside of alignment sleeve using lint free material – Length L1: 2 m – Length L2: 2 m – Recovery procedure: none Requirements: – Allowable attenuation: less than 0,2 dB against two reference plugs
<i>Cold</i> 4.5.17 (61300-2-17) Details: – Temperature: –10 °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°/min – Deviations: none – Plug shall be in accordance with: IEC 60874-14-5 (SC-PC untuned) for variants 1001 to 1004 IEC 60874-14-6 (SC-APC 9° untuned) or IEC 60874-14-10 (SC-APC 8° untuned) for variants 1005 to 1008 – 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 Initial measurements and performance requirements: – Attenuation: less than 0,75 dB Measurements and performance requirements during test: – Attenuation: less than 0,75 dB – Change in attenuation: less than 0,2 dB Final measurements and performance requirements: – Attenuation: less than 0,75 dB – Change in attenuation: less than 0,2 dB

(continued)