

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

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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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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.

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

FOREWORD

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- 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.
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International Standard IEC 60874-14-3 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

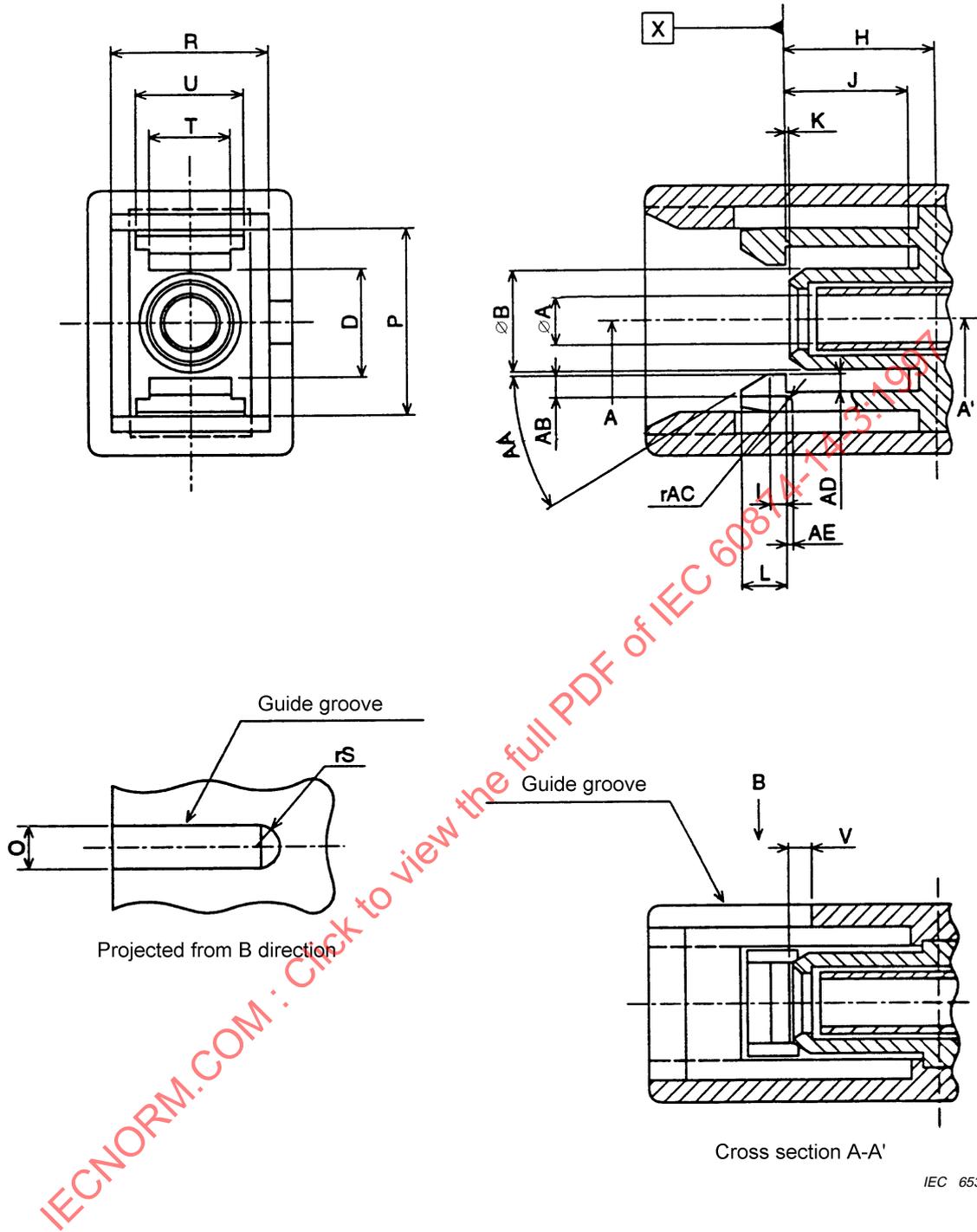
Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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	
<ul style="list-style-type: none"> • GENERIC SPECIFICATION: QC 910000 (IEC 60874-1) • BLANK DETAIL SPECIFICATION: QC 910001 (IEC 60874-1-1) 	
FIBRE OPTIC ADAPTOR	
CLASSIFICATION:	
Type: Name: SC	
<p style="margin-left: 40px;">For use in datacom applications as specified in ISO/IEC International Standard 11801: "Generic cabling for customer premises"</p>	
Configuration: plug-adaptor-plug	
Coupling: push-pull	
Control dimensions:	
<ul style="list-style-type: none"> - 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.	

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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	2
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°	degrees
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.

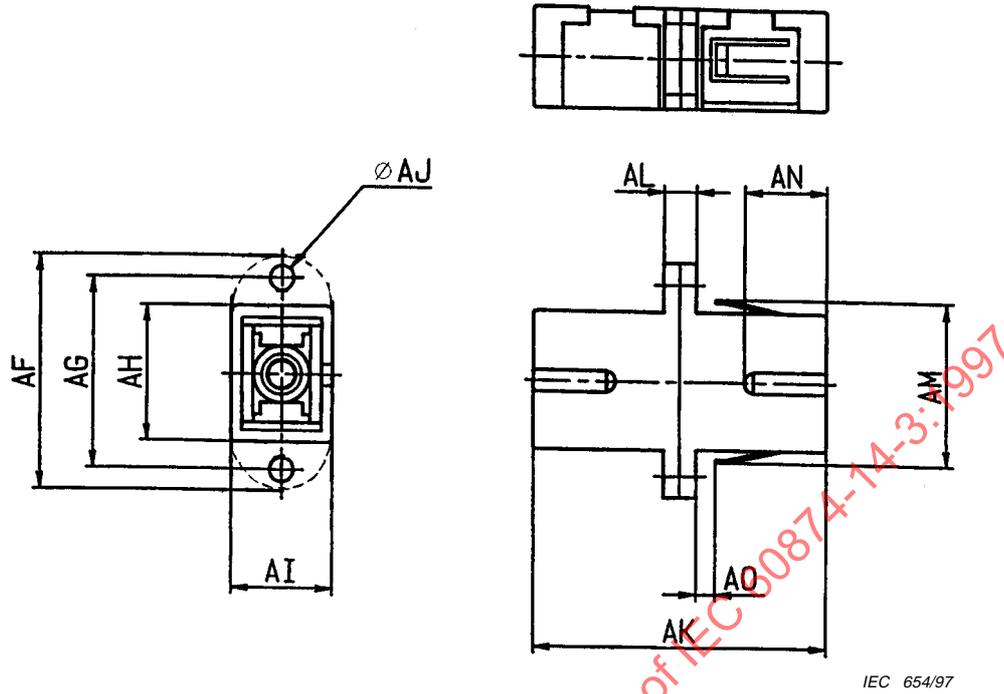
2 For the angled PC variants (Nos. 1005 to 1008) the two slots "O" shall be symmetric within $\pm 0,03$ mm.

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)



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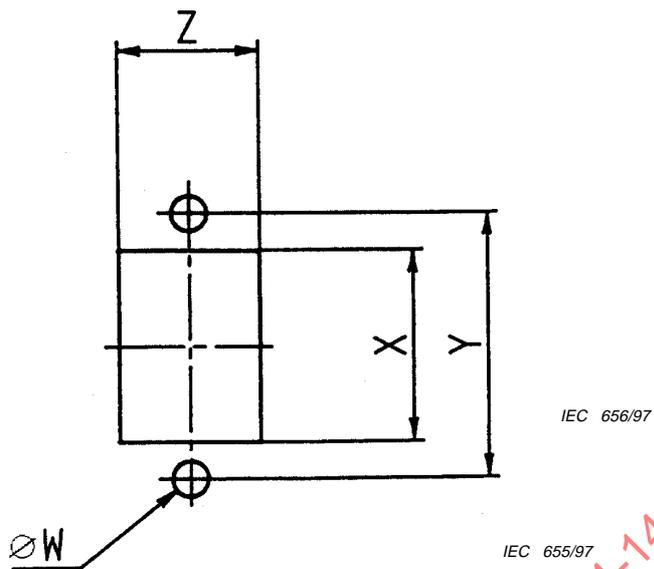
Reference	Dimensions mm		Notes
	Minimum	Maximum	
AF	21,5	22,5	1
AG	17,5	18,5	
AH	12,6	13,0	
AI	9,2	9,4	1
AJ	2,2	2,5	
AK	27,0	27,8	
AL	2,8	3,2	
AM	14,4	16,4	
AN	7,7	8,0	
AO	1,7	2,0	2

NOTES

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

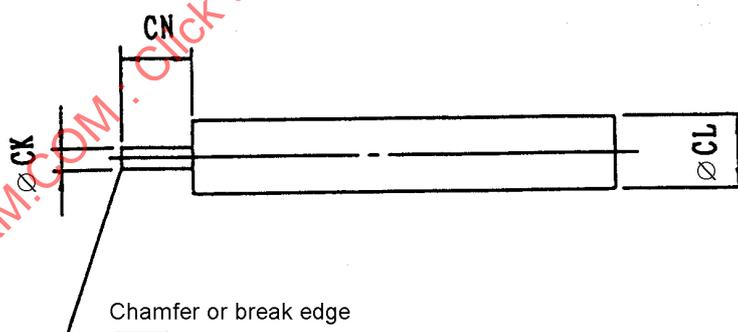
2 If the adaptor is mounted using this hook, the thickness of the panel shall be 1,6 mm.

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

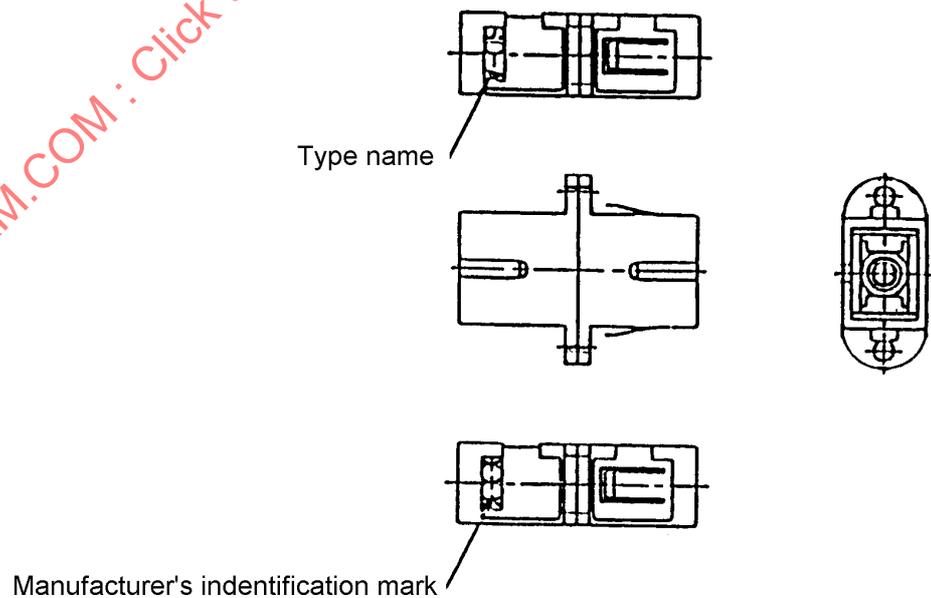
VARIANT IDENTIFICATION NUMBERS				
Number: QC 910X01/0003-ZZZZ				
ZZZZ	Component name	Variant feature		
		Housing part material	Sleeve material	Preferred housing colour/indicator
1001	Adaptor SMF	Plastic	Zirconia	Blue
1002	Adaptor SMF	Plastic	Phosphor bronze	Blue
1003	Adaptor SMF	Metal	Zirconia	Blue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



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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 %
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.			

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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	4.4.1 (3-1)	18	24
– Dimensions	4.4.2 (3-1)		
– Gauge retention force	(3-33)		
Group C1			
– Attenuation	4.4.7 (3-4)	18	24
Group C2			
– Cold	4.5.17 (2-17)	6	24
– Dry heat	4.5.18 (2-18)		
– Damp heat (steady state)	4.5.19 (2-19)		
Group D0			
– Visual examination	4.4.1 (3-1)	20	48
– Dimensions	4.4.2 (3-1)		
– Gauge retention force	(3-33)		
Group D1			
– Attenuation	4.4.7 (3-4)	20	48
Group D2			
– Cold	4.5.17 (2-17)	6	48
– Dry heat	4.5.18 (2-18)		
– Damp heat (steady state)	4.5.19 (2-19)		
Group D3			
– Engagement and separation force	4.4.5 (3-11)	6	48
– Mechanical endurance	4.5.2 (2-2)		
Group D4			
– Vibration	4.5.1 (2-1)	4	48
– Change of temperature (test Nb)	4.5.22 (2-22)		
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>Gauge retention force (61300-3-33)</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> <p>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</p> <p><u>Reference adaptor</u></p> <p>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.</p> <ul style="list-style-type: none"> - 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 <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 °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 <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)