IEC 60874-19-1

Edition 3.0 2007-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

QC 910005XX0001

Fibre optic interconnecting devices and passive components – Connectors for optical fibres and cables – Part 19-1: Fibre optic patch cord connector type SC-PC (floating duplex) standard terminated on multimode fibre type A1a, A1b – Detail specification

Dispositifs d'interconnexion et composants passifs à fibres optiques – Connecteurs pour câbles et fibres optiques – Partie 19-1: Connecteur de cordon de liaison à fibres optiques de type SC-PC (duplex flottant) à terminaison standard sur fibres multimodes de type A1a, A1b – Spécification particulière

IEC 60874-19-1:2007

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FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – CONNECTORS FOR OPTICAL FIBRES AND CABLES –

Part 19-1: Fibre optic patch cord connector type SC-PC (floating duplex) standard terminated on multimode fibre type A1a, A1b – Detail specification

FOREWORD

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International Standard IEC 60874-19-1 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This third edition cancels and replaces the second edition published in 2003. It constitutes a technical revision and updated to harmonise with the requirements from IEC 61753-1, the optical interface of IEC 61755-3-3 and the modal condition as specified in IEC 61300-1.

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

FDIS	Report on voting
86B/2598/FDIS	86B/2640/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 2.

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 910005XX0001).

A list of all parts of the IEC 60874 series, under the general title: *Fibre optic interconnecting devices and passive components – Connectors for optical fibres and cables*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- replaced by a revised edition, or
- amended.

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – CONNECTORS FOR OPTICAL FIBRES AND CABLES –

Part 19-1: Fibre optic patch cord connector type SC-PC (floating duplex) standard terminated on multimode fibre type A1a, A1b – Detail specification

FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – CONNECTORS FOR OPTICAL BRES AND CABLES	
Part 19-1: Fibre optic patch cord connector type SC-PC (floating duplex) standard terminated on multimode fibre type A1a, A1b - Detail specification	
NATIONAL STANDARDS ORGANIZATION:	..... **Date.....**
DETAIL SPECIFICATION IEC QC 910005XX0001	
FIBRE OPTIC COMPONENT OF ASSESSED QUALITY IN ACCORDANCE WITH	
• GENERIC SPECIFICATION: QC 910000 (IEC 60874-1)	
CONNECTOR SET FOR OPTICAL FIBRES AND CABLES	
CLASSIFICATION:	
Type: Name: SC (floating duplex)	
For use in applications as specified in ISO/IEC International Standard 11801: 2002, Information technology – Generic cabling for customer premises and as defined in category C of IEC 61753-1 Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards	
Configuration: plug-adaptor-plug	
Coupling: push-pull	
Control dimensions:	
- Plug: see Figures 1, 2 and 3	
- Adaptor: See IEC 60874-19-3	
Arrangement: Patch cord arrangement	
Style: Fibre retention: as required	
Cable retention: as required	
Optical coupling: butting	
Alignment: resilient sleeve alignment	
Variants: See page 8	
Climatic category: 10/60/4	
Environmental category: 4 (category C of IEC 61753-1)	
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	
Core diameter	in accordance with IEC 60793-2
Cladding diameter	in accordance with IEC 60793-2
Buffer diameter	(250 ± 15) µm, (500 ± 30) µm, (900 ± 50) µm
Tension member	Aramid strength member
Jacket outer diameter	As required per variant

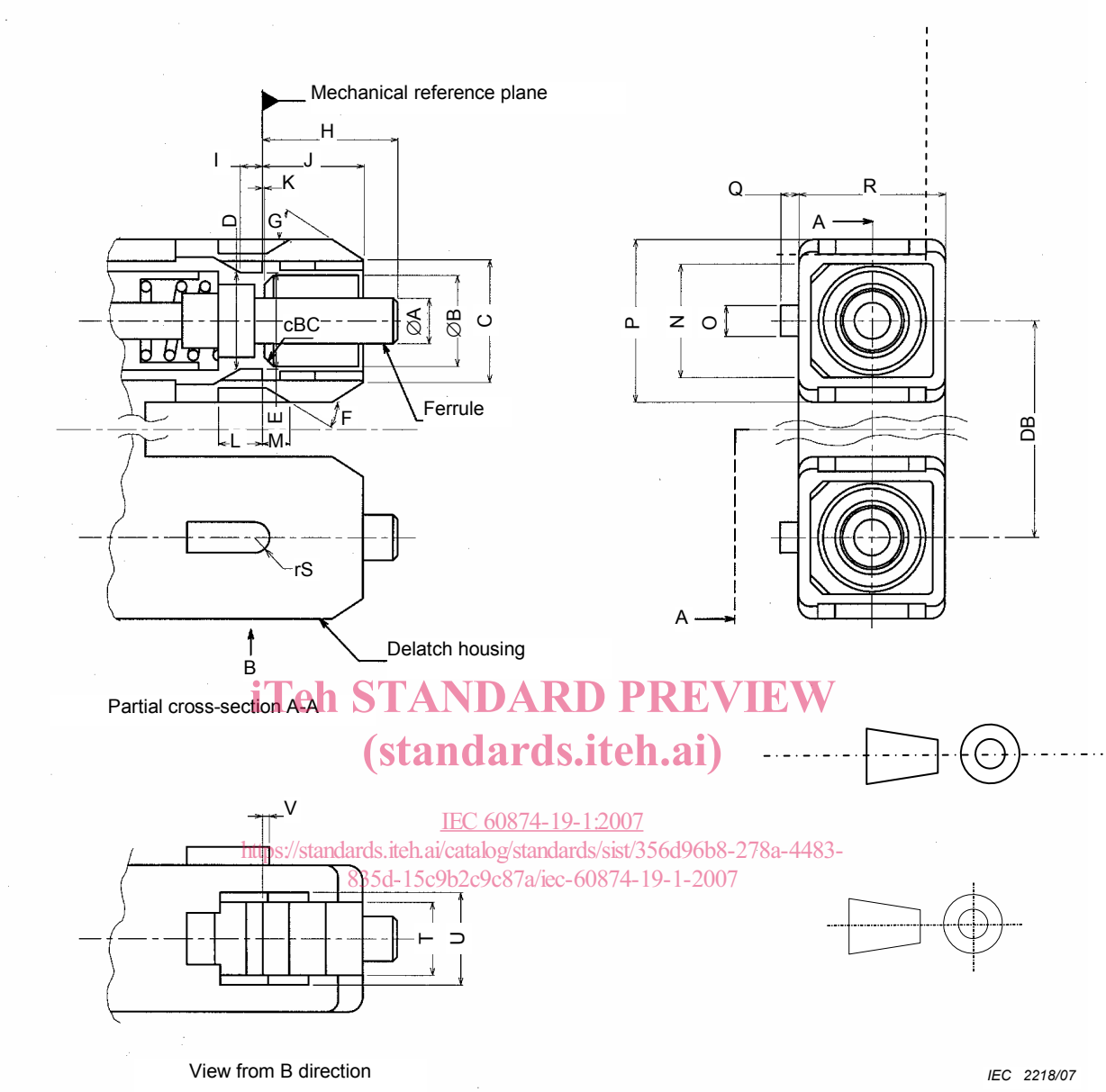


Figure 1 – Plug mating face dimensions

Reference	Dimensions mm		Notes
	Minimum	Maximum	
A	2,497	2,500	Diameter
B	4,80	4,90	Diameter
C	6,80	7,40	
D	4,90	5,30	
E	6,70	6,80	
F	19°	23°	
G	25°	35°	
H	7,15	7,50	1
I	0,80	1,20	
J	5,30	5,50	
K	-0,10	0,05	2
L	2,11	2,50	
M	2,00	2,80	
N	6,60	6,80	
O	1,60	1,80	
P	8,89	8,99	
Q	0,80	1,00	
R	7,29	7,39	
S	0,80	0,90	Radius
T	4,05	4,15	
U	5,40	5,60	
V	0	0,50	
BC	0	0,50	Chamfer
DB	12,25	13,15	

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.

Plugs shall be capable of floating between the DB maximum and DB minimum.

NOTE 1 This value shows the dimension after the ferrule is polished and in the unmated condition.

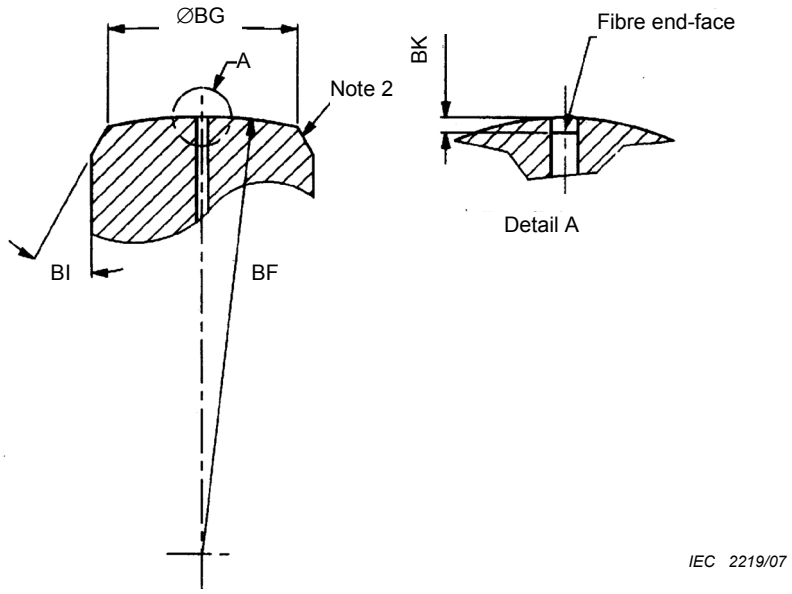
NOTE 2 The negative dimension refers that the position of the inside bottom plane is left-direction relative to the plane defined as mechanical reference plane.

NOTE 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.

NOTE 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.

NOTE 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 – Plug mating face dimensions *(continued)*



Reference	Dimensions mm		Notes
	Minimum	Maximum	
BF	**5,00**	**30,00**	**radius**
BG	**1,90**	**2,26**	**Diameter, 1**
BI	**25°**	**35°**	
BK	**-0,0001**	**See graph**	**3, see curve, page 8**

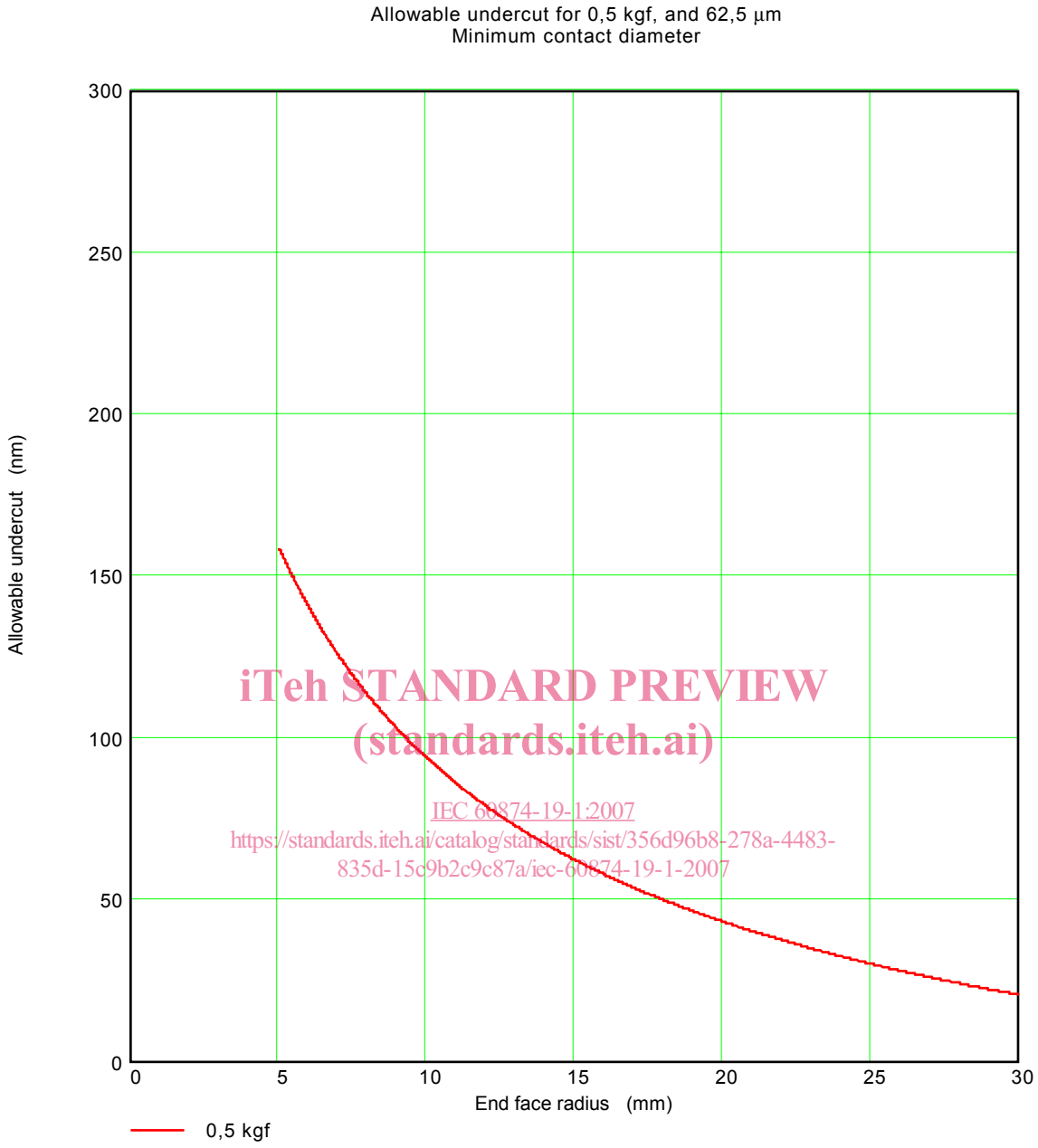
Eccentricity of convex polished ferule end face is less than 50 µm.

NOTE 1 This value is applicable for variants as per variant table on page 12.

NOTE 2 Break edge.

NOTE 3 The negative dimension refers to the fibre protrusion. Dimension BK should be measured according to IEC 61300-3-23.

Figure 2 – Ferrule end face geometry after termination

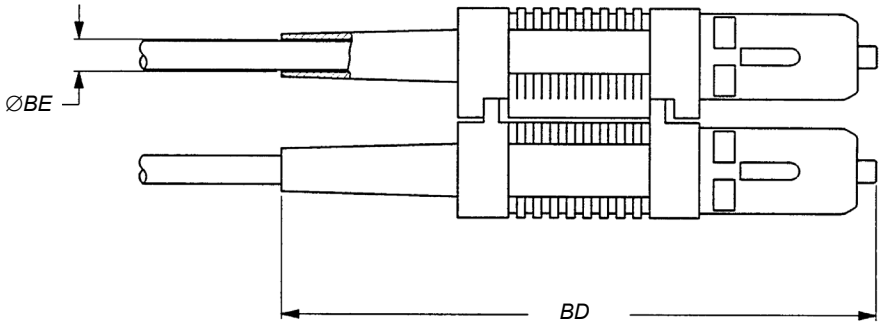


$u_{0,5}(R, \delta) = 1\,566\,R^{-0,75} - R \times 10^{-6} + (\sqrt{R^2 \times 10^6 - \delta^2}) \times 10^3 - 50 - 10$

$u_{0,5}(R, \delta)$ = Allowable undercut (nm)

R = End face radius (mm)

δ = Eccentricity of convex polished ferrule end face



IEC 2220/07

Reference	Dimensions mm		Notes
	Minimum	Maximum	
BD		60	
BE	2,20		1
BE	2,60		2
BE	2,90		3
BE	3,20		4

NOTE 1 This value is applicable to the variant number –1001.

NOTE 2 This value is applicable to the variant number –1002.

NOTE 3 This value is applicable to the variant number –1003.

NOTE 4 This value is applicable to the variant number –1004.

Figure 3 – Plug dimension

VARIANT IDENTIFICATION NUMBERS NUMBER: XXXXXXXXXXXX			
Variant	**Component name**	**Variant feature**	
		Applicable cable jacket diameter mm	**Ferrule material**
1001	Plug	2,00	Yttria partly stabilized zirconia
1002	Plug	2,40	Yttria partly stabilized zirconia
1003	Plug	2,70	Yttria partly stabilized zirconia
1004	Plug	3,00	Yttria partly stabilized zirconia

SUPPLEMENTARY INFORMATION

Colour:
Colour of the de-latch housing and boot shall be beige, according to: RAL 1013.

Component marking:
The name and/or manufacturer's identification mark may be permanently identified. Figure 4 shows an example of the location of the component marking.

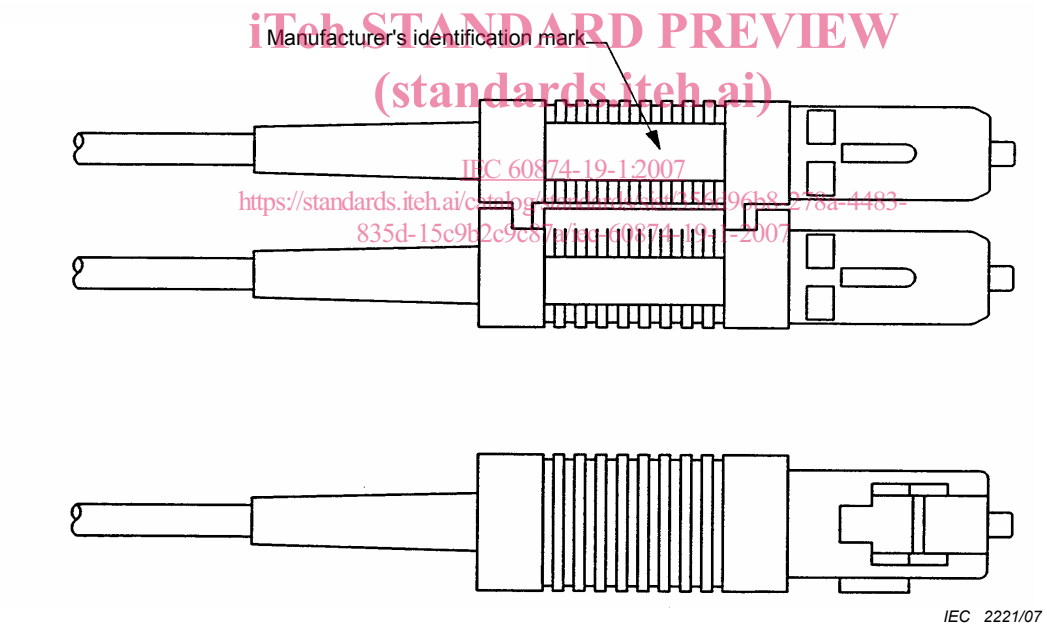


Figure 4 – Example of component marking

Table 1 – Fixed sample test schedule for qualification approval

Test sequence	Reference IEC 61300	*n*
Group 0		
– Visual examination	3-1	20
– Dimensions	3-1	
Group 1		
– Attenuation	3-4	20
– Attenuation (Random mate)	3-34	
– Return loss (Random mate)	3-6	
Group 2		
– Cold	2-17	
– Dry heat	2-18	6
– Damp heat (steady state)	2-19	
Group 3		
– Impact (method A)	2-12	
– Engagement and separation force	3-11	6
– Mating Durability	2-2	
Group 4		
– Vibrations	2-1	4
– Change of Temperature	2-22	
Group 5		
– Tensile strength of coupling mechanism	2-6	4
– Fibre/cable retention	2-4	
– Flexing of strain relief	2-44	
– Static side load	2-42	

n = sample size (number of plugs).

To satisfy the qualification approval requirements of the detail specification there should be no failures in the sample groups for any test parameter. If a failure does occur this should be investigated and the cause of failure identified and corrected. The test which is affected should then be repeated using the minimum sample size stated in this detail specification.

A fully documented test report and supporting data should be prepared and made available for inspection. Failures and the corrective action taken to eliminate failures should 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.

Unless otherwise indicated, the test details, measurements and performance requirements are given in Table 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 61300	Assessment level *A*	
		IL	AQL
Group A			
– Visual examination	3-1	II	4 %
– Radius	3-16		
– Undercut/protrusion	3-23		
– Eccentricity of spherical polished end faces	3-25		
Group B			
– Attenuation	3-4	II	4 %

NOTE 1 Unless otherwise indicated, the details, measurements and performance requirements are given in Table 4.

NOTE 2 IL = inspection level; AQL = acceptable quality level.

NOTE 3 Only attenuation tests should be carried out using a reference connector. All other tests should 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 61300	Assessment level *A*	
		n	*p*
Group C0 – Visual examination – Dimensions	 3-1 3-1	18	24
Group C1 – Attenuation – Attenuation (random mate) – Return loss (random mate)	 3-4 3-34 3-6	18	24
Group C2 – Cold – Dry heat – Damp heat (steady state)	 2-17 2-18 2-19	6	24
Group D0 – Visual examination – Dimensions	 3-1 3-1	20	48
Group D1 – Attenuation – Attenuation (random mate) – Return loss (random mate)	 3-4 3-34 3-6	20	48
Group D2 – Cold – Dry heat – Damp heat (steady state)	 2-17 2-18 2-19	6	48
Group D3 – Impact (method A) – Engagement and separation force – Ferrule compression force – Mating durability	 2-12 3-11 3-22 2-2	6	48
Group D4 – Vibrations – Change of temperature	 2-1 2-22	4	48
Group D5 – Strength of coupling mechanism – Fibre/cable retention – Flexing of strain relief – Static side load	 2-6 2-4 2-44 2-42	4	48

n = sample size (number of plugs); *p* = periodicity in months.

To satisfy the conformance inspection 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 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.

Unless otherwise indicated, the details, measurements and performance requirements are given in Table 4.

Only the first test of 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.