SLOVENSKI STANDARD

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Konektorski pribor in povezovalne komponente za uporabo v komunikacijskih sistemih z optičnimi vlakni – Specifikacije izdelka – 7-2. del: Tip LC-PC dupleks, zaključen na enorodnem vlaknu kategorije B1.1 po IEC 60793-2*

Connector sets and interconnect components to be used in optical fibre communication systems – Product specifications – Part 7-2: LC-PC duplex terminated on IEC 60793-2 category B1.1 singlemode fibre

ICS 33.180.20

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EUROPEAN STANDARD **EN 50377-7-2**

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English version

Connector sets and interconnect components to be used in optical fibre communication systems – Product specifications Part 7-2: LC-PC duplex terminated on IEC 60793-2 category B1.1 singlemode fibre

Jeux de connecteurs et composants d'interconnexion à utiliser dans les systèmes de communication par fibres optiques – Spécifications de produits Partie 7-2: Type duplex LC-PC câblé sur une fibre unimodale de catégorie B1.1 selon la CEI 60793-2

Steckverbindersätze und Verbindungsbauelemente für Lichtwellenleiter-Datenübertragungssysteme – Produktnormen Teil 7-2: Bauart LC-PC-Duplex zum Anschluss an Einmodenfasern der Kategorie B1.1 nach IEC 60793-2

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 86BXA, Fibre optic interconnect, passive and connectorised components.

The text of the draft was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 50377-7-2 on 2003-12-02.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2004-12-01

- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-12-01

Connector sets and interconnect components to be used in optical fibre communication systems – Product specifications

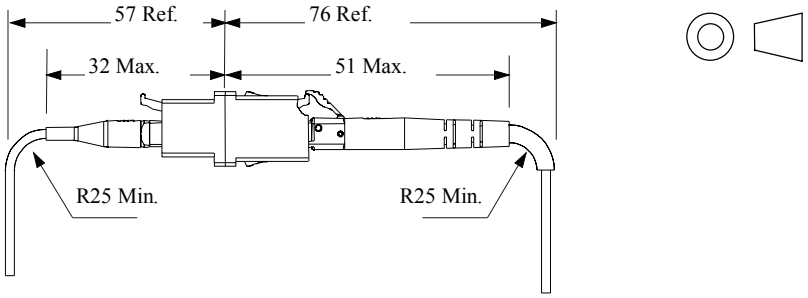
Part 7-2: LC-PC duplex terminated on IEC 60793-2 category B1.1 singlemode fibre

Description		Performance	
Coupling mechanism:	latch push-pull	Application:	IEC 61753-2-1 category U and ES 200-671 environments (see 1.3)
Configuration:	plug/adaptor/plug	Attenuation grade: (Random mate)	P: <0,35 dB mean. <1,0 dB for > 97 % of measurements Q: <0,30 dB mean. <0,60 dB for > 99 % of measurements
Fibre category:	IEC 60793-2-50 type B1.1	Return loss grade: (Random mate)	2: ≥ 45 dB 3: ≥ 35 dB 4: ≥ 26 dB
Cable type	see Clause 4		

Normative references

EN 61300 series	Fibre optic interconnection devices and passive components - Basic test and measurement procedures
EN 61753-1-1	Performance standard - Part 1: General guidance
EN 61754-20	Basic standard for interface dimensions - Part 20: Type LC connector family
EN 186000	Generic specification - Connector sets for optical fibres and cables
IEC 60794-2	Optical fibre cables - Part 2: Product specifications (indoor cable)
ES 200 671	Passive optical components; Optical fibre connectors for single – Mode optical fibre communications system; Common requirements and conformance testing
ES 300 019 series	Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment.

Outline and maximum dimensions:



Contents

1 Scope

1.1 Product definition

This European Standard contains the initial, start of life dimensional, optical, mechanical and environmental performance requirements which a terminated and assembled singlemode resilient alignment sleeve LC-PC duplex connector set (plug / adaptor / plug) must meet in order for it to be categorised as an European Standard product.

Since different variants and grades of performance are permitted, product marking details are given in 3.5.

1.2 Intermateability

Although all products conforming to the requirements of this European Standard will intermate, the resulting level of random attenuation performance will only be ensured in accordance with Table 1. The intention is that this will be true irrespective of the manufacturing source(s) of the product.

In all cases, the intermating of plug variants having different attenuation or return loss grades will result in an uncertain level of random attenuation performance. When intermating plug variants having different return loss grades, the resulting level of return loss can not be assured to be any better than the worst return loss grade.

Similarly, the intermating of a grade P plug with a grade Q plug will result in an uncertain level of random attenuation performance.

Table 1 - Ensured level of random attenuation

Plug variant/attenuation grade	P	Q
P	P	P
Q	P	Q

A simplex plug can be connected in a duplex adaptor without degrading the level of performance.

1.3 Operating environment

The tests selected combined with the severities and durations are representative of an external weather protected environment defined by:

- ES 200 671 External weather protected environment defined by ES 300 019 classes 3.3, 3.4 and 3.5;
- EN 61753-2-1 Category U: uncontrolled environment

1.4 Reliability

Whilst the anticipated service life expectancy of the product in this environment is 20 years, compliance with this European Standard does not guarantee the reliability of the product. This should be predicted using a recognised reliability assessment programme.

1.5 Quality assurance

Compliance with this European Standard does not guarantee the manufacturing consistency of the product. This should be maintained using a recognised quality assurance programme.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 61300 Series	Fibre optic interconnection devices and passive components - Basic test and measurement procedures
EN 61300-2-1	Part 2-1: Tests - Vibration (sinusoidal)
EN 61300-2-2	Part 2-2: Tests - Mating durability
EN 61300-2-4	Part 2-4: Tests - Fibre/cable retention
EN 61300-2-5	Part 2-5: Tests - Torsion
EN 61300-2-6	Part 2-6: Tests - Tensile strength of coupling mechanism
EN 61300-2-7	Part 2-7: Tests - Bending moment
EN 61300-2-12	Part 2-12: Tests - Impact
EN 61300-2-17	Part 2-17: Tests - Cold
EN 61300-2-18	Part 2-18: Tests - Dry heat - High temperature endurance
EN 61300-2-19	Part 2-19: Tests - Damp heat (steady state)
EN 61300-2-21	Part 2-21: Tests – Damp heat (cycling)
EN 61300-2-22	Part 2-22: Tests - Change of temperature
EN 61300-2-23	Part 2-23: Tests - Undercut
EN 61300-2-26	Part 2-26: Tests – Salt mist
EN 61300-2-27	Part 2-27: Tests - Dust
EN 61300-2-42	Part 2-42: Tests - Static side load for connectors
EN 61300-3-4	Part 3-4: Examinations and measurements - Attenuation
EN 61300-3-6	Part 3-6: Examinations and measurements - Return loss
EN 61300-3-34	Part 3-34: Examinations and measurements - Attenuation of random mated connectors
EN 61753-1-1	Fibre optic interconnecting devices and passive components performance standard - Part 1-1: General and guidance – Interconnecting devices (connectors)
IEC 60794-2	Optical fibre cables - Part 2: product specifications
IEC 61754-20	Basic standard for interface dimensions - Part 20: Type LC connector family
ES 200 671	Passive optical components; optical fibre connectors for singlemode optical fibre communications system; common requirements and conformance testing
ES 300 019 Series	Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment.

3 Description

The LC-PC duplex connector is a single position plug connector set of plug adaptor plug configuration characterised by cylindrical, spring loaded butting ferrules of 1,25 mm nominal diameter and a latched push-pull coupling mechanism. The optical alignment mechanism of the connectors is of a resilient sleeve style.

3.1 Plug

The plug features a cylindrical zirconia ceramic ferrule and a latched push-pull mechanism. It has a single male key which is used to limit and may be used to orientate, the relative rotation between mated connectors.

A cover (dust cap) to protect the ferrule endface when the connector is in the unmated condition shall be provided.

Alternative materials may be used for the ferrule that have directly compatible material properties to zirconia but the endface and performance requirements must be met under all conditions

3.2 Adaptor

The adaptor has a zirconia ceramic resilient alignment sleeve. The mounting style is duplex rectangular flange equipped with snap-latches.

Covers (dust caps) shall be provided to protect each port of the adaptor.

Alternative materials may be used for the sleeve that have directly compatible material properties to zirconia but the performance requirements must be met under all conditions

3.3 Materials

Materials which are not specified or which are not specifically described are left to the discretion of the manufacturer.

3.4 Dimensions

Outline dimensions and other dimensions necessary to ensure intermateability or which affect performance are specified. All other dimensions are left to the discretion of the manufacturer. Where the mating face limit dimensions are not in agreement with an IEC interface standard this is clearly stated.

3.5 Colour and marking

Marking of the product shall be in accordance with 2.6.2 of EN 186 000-1 in the following order of precedence:

a) identification of manufacturer;
b) manufacturing date code : year/week;
c) manufacturers part number;
d) variant identification number.

The following colour scheme is preferred:

Table 2 - Preferred colour scheme

Delatch housing	Adaptor
Blue	Blue

NOTE The preferred Blue is RAL 5015.

4 Variants

4.1 Terminated plug

The following variants are permitted:

Table 3 - Plug fibre/cable variants with fibre category IEC 60793-2 Type B1.1

Variant number	Fibre/Cable Ømm	Structure
P01	0,7 - 1,4	Buffered fibre
P02	1,6 ± 0,2	Reinforced cable
P03	2,0 ± 0,2	Reinforced cable
P04	2,5 ± 0,2	Reinforced cable
Q01	0,7 - 1,4	Buffered fibre
Q02	1,6 ± 0,2	Reinforced cable
Q03	2,0 ± 0,2	Reinforced cable
Q04	2,5 ± 0,2	Reinforced cable

4.2 Adaptor

The following variants are permitted:

Table 4 - Adaptor variants

Variant number	Format
A01	Rectangular flange - duplex

4.3 Identification of variants

The identification numbers for the fibre/cable variants and adaptor variants with fibre category IEC 60793-2 type B1.1 are given in Tables 5, 6 and 7.

Table 5 – Identification plug fibre/cable, P grade variants with fibre category IEC 60793-2 type B1.1

Variant number	Fibre type	Performance grade (return loss)	Identification number
P01	B1.1	2	EN50377-7-2-P01-2
P01	B1.1	3	EN50377-7-2-P01-3
P01	B1.1	4	EN50377-7-2-P01-4
P02	B1.1	2	EN50377-7-2-P02-2
P02	B1.1	3	EN50377-7-2-P02-3
P02	B1.1	4	EN50377-7-2-P02-4
P03	B1.1	2	EN50377-7-2-P03-2
P03	B1.1	3	EN50377-7-2-P03-3
P03	B1.1	4	EN50377-7-2-P03-4
P04	B1.1	2	EN50377-7-2-P04-2
P04	B1.1	3	EN50377-7-2-P04-3
P04	B1.1	4	EN50377-7-2-P04-4

Table 6 - Identification plug fibre/cable, Q grade variants with fibre category IEC 60793-2 Type B1.1

Variant number	Fibre type	Performance grade (return loss)	Identification number
Q01	B1.1	2	EN50377-7-2-Q01-2
Q01	B1.1	3	EN50377-7-2-Q01-3
Q01	B1.1	4	EN50377-7-2-Q01-4
Q02	B1.1	2	EN50377-7-2-Q02-2
Q02	B1.1	3	EN50377-7-2-Q02-3
Q02	B1.1	4	EN50377-7-2-Q02-4
Q03	B1.1	2	EN50377-7-2-Q03-2
Q03	B1.1	3	EN50377-7-2-Q03-3
Q03	B1.1	4	EN50377-7-2-Q03-4
Q04	B1.1	2	EN50377-7-2-Q04-2
Q04	B1.1	3	EN50377-7-2-Q04-3
Q04	B1.1	4	EN50377-7-2-Q04-4

Table 7 - Adaptor variants

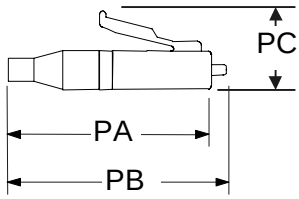
Variant number	Identification number
A01	EN50377-7-2-A01

5 Dimensional requirements

5.1 Outline dimensions

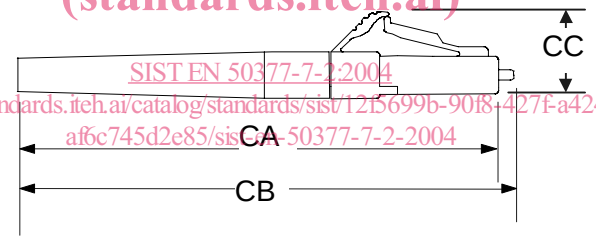
5.1.1 Plug variants

Variant number: P01/Q01



Ref.	Dimensions mm			Notes
	Min.		Max.	
PA	-		30	
PB	-		32	
PC	-		9,4	

Variant number: P02 - P04, Q02 - Q04



Ref.	Dimensions mm			Notes
	Min.		Max.	
CA	-		49	
CB	-		51	
CC	-		10,5	

Figure 1 - Outline dimensions - Plug