

Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 13-2: Type LX.5-PC DUPLEX terminated on IEC 60793-2-50 category B1.1 and B1.3 singlemode fibre, with full zirconia ferrule category U

EVS

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 50377-13-2:2011 sisaldab Euroopa standardi EN 50377-13-2:2011 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 30.04.2011 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 25.03.2011.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN 50377-13-2:2011 consists of the English text of the European standard EN 50377-13-2:2011.

This standard is ratified with the order of Estonian Centre for Standardisation dated 30.04.2011 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 25.03.2011.

The standard is available from Estonian standardisation organisation.

ICS 33.180.20

Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Eesti; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

Right to reproduce and distribute belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:
Aru str 10 Tallinn 10317 Estonia; www.evs.ee; Phone: 605 5050; E-mail: info@evs.ee

**Connector sets and interconnect components to be used in optical fibre communication systems -
Product specifications -
Part 13-2: Type LX.5-PC DUPLEX terminated on IEC 60793-2-50 category B1.1 and B1.3 singlemode fibre, with full zirconia ferrule category U**

Jeux de connecteurs et composants d'interconnexion à utiliser dans les systèmes de communication par fibres optiques -
Spécifications de produits -
Partie 13-2: Type LX.5-PC duplex raccordé sur des fibres unimodales de catégorie B1.1 et B1.3 de la CEI 60793-2-50, avec ferrule en zircone plein de catégorie U

Steckverbindersätze und Verbindungselemente für Lichtwellenleiter-Datenübertragungssysteme -
Produktnormen -
Teil 13-2: Bauart LX.5-PC-Duplex zum Anschluss an Einmodenfasern der Kategorien B1.1 und B1.3 nach IEC 60793-2-50 mit Zirkonium-Ferrule für die Kategorie U

This European Standard was approved by CENELEC on 2011-01-02. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

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 formal vote and was approved by CENELEC as EN 50377-13-2 on 2011-01-02.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

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) | 2012-01-02 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn | (dow) | 2014-01-02 |
-

EVS

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

Part 13-2: Type LX.5-PC DUPLEX terminated on IEC 60793-2-50 category B1.1 and B1.3 singlemode fibre, with full zirconia ferrule category U

Description		Performance	
Coupling mechanism:	Latched push-pull	Application:	For use in EN category U (Uncontrolled environment)
Configuration:	Plug/adaptor/plug	Attenuation grades:	B: $\leq 0,12$ dB mean $\leq 0,25$ dB for > 97 % of measurements
Fibre category:	EN 60793-2-50, Types B1.1 and B1.3		C: $\leq 0,25$ dB mean $\leq 0,50$ dB for > 97 % of measurements
Cable type:	see Table 3	Return loss grades:	2: ≥ 45 dB

Related documents:

EN 60794-2, *Optical fibre cables – Part 2: Indoor cables – Sectional specification* (IEC 60794-2)

EN 61300 series, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures* (IEC 61300 series)

EN 61753-1, *Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards* (IEC 61753-1)

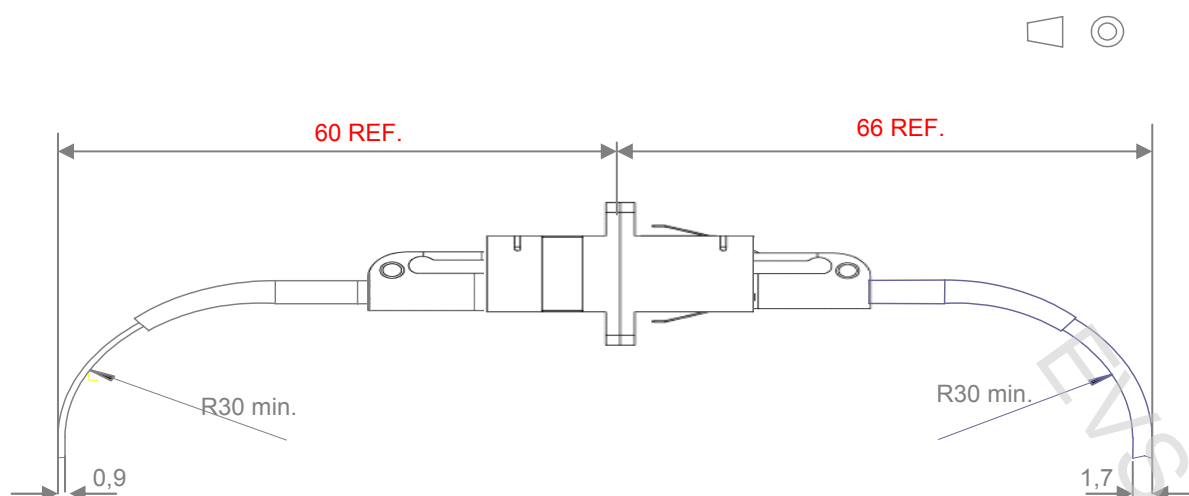
EN 61754-23, *Fibre optic connector interfaces – Part 23: Type LX.5 connector family* (IEC 61754-23)

EN 61755-1, *Fibre optic connector optical interfaces – Part 1: Optical interfaces for single mode non-dispersion shifted fibres – General and guidance* (IEC 61755-1)

EN 61755-3-1, *Fibre optic connector optical interfaces – Part 3-1: Optical interface, 2,5 mm and 1,25 mm diameter cylindrical full zirconia PC ferrule, single mode fibre* (IEC 61755-3-1)

ETSI TS 100 671, *Transmission and Multiplexing (TM); Passive optical components; Optical fibre connectors for single mode optical fibre communication systems; Common requirements and conformance testing*

Outline and maximum dimensions:



Contents

1	Scope	6
1.1	Product definition	6
1.2	Intermateability	6
1.3	Operating environment	6
1.4	Reliability	6
1.5	Quality assurance	6
2	Normative references	7
3	Description	8
3.1	General	8
3.2	Plug	8
3.3	Duplex adaptor	8
3.4	Materials	8
3.5	Dimensions	8
3.6	Colour and marking	8
4	Variants	9
4.1	Terminated plug	9
4.2	Adaptor	10
5	Dimensional requirements	10
5.1	Outline dimensions	10
5.2	Mating face and other limit dimensions	12
6	Tests	24
6.1	Sample size	24
6.2	Test and measurement methods	25
6.3	Test sequence	25
6.4	Pass/fail criteria	25
7	Test report	25
8	Performance requirements	25
8.1	Dimensional and marking requirements	25
8.2	Optical performance requirements	26
8.3	Mechanical performance requirements	28
8.4	Environmental performance requirements	33
	Annex A (informative) Attenuation against reference	35
	Annex B (normative) Adaptor matched reference plug details	36
	Annex C (normative) Sample size and product sourcing requirements	37
	Annex D (informative) Zirconia ferrule response surface	38
	Bibliography	39

Figures

Figure 1 – Outline dimensions – Plug	11
Figure 2 – Outline dimensions – Duplex adaptor	12
Figure 3 – Mating face and other limit dimensions of plug connector interface	13
Figure 4 – Ferrule end face geometry – After termination	16
Figure 5 – Positioning of fibre core.....	16
Figure 6 – Ferrule end face geometry – Allowable undercut.....	18
Figure 7 – Requirements for the attenuation grades for the plug fibre core connected to the ideal reference	19
Figure 8 – Adaptor mating face and other limit dimensions	20
Figure 9 – Pin gauge for adaptor.....	24
Figure D.1 – Radius vs. undercut and apex offset	38

Tables

Table 1 – Ensured level of random attenuation.....	6
Table 2 – Preferred colour scheme	9
Table 3 – Plug variants	9
Table 4 – Adaptor variants	10
Table 5 – Geometrical parameters	17
Table 6 – Optical performance requirements.....	26
Table 7 – Mechanical performance requirements	28
Table 8 – Environmental performance requirements.....	33
Table A.1.....	35
Table A.2 – Reference connector details.....	35
Table B.1.....	36
Table C.1	37

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 LX.5 PC connector set (plug/ adaptor/ plug) should meet in order for it to be categorised as an EN standard product.

Since different variants and grades of performance are permitted, product marking details are given in 3.6.

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.

When intermating plug variants having different attenuation grades, the resulting level of attenuation cannot be assured to be any better than the worst attenuation grade.

The intermating of a grade C plug with a grade B plug will result in an uncertain level of random attenuation performance.

Table 1 – Ensured level of random attenuation

Plug attenuation grade	C	B
C	C	C
B	C	B

1.3 Operating environment

The tests selected combined with the severities and durations are representative of a category U environment described in EN 61753-1.

1.4 Reliability

Whilst the anticipated service life expectancy of the product in this environment is 20 years, compliance with this specification 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 specification does not guarantee the manufacturing consistency of the product. This should be maintained using a recognised quality assurance programme.

EVS

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 60793-2-50	Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres (IEC 60793-2-50)
EN 61300 (series)	Fibre optic interconnecting devices and passive components – Basic test and measurement procedures (IEC 61300 series)
EN 61300-2-1	Part 2-1: Tests – Vibration (sinusoidal) (IEC 61300-2-1)
EN 61300-2-2	Part 2-2: Tests – Mating durability (IEC 61300-2-2)
EN 61300-2-4	Part 2-4: Tests – Fibre/cable retention (IEC 61300-2-4)
EN 61300-2-5	Part 2-5: Tests – Torsion/twist (IEC 61300-2-5)
EN 61300-2-6	Part 2-6: Tests – Tensile strength of coupling mechanism (IEC 61300-2-6)
EN 61300-2-7	Part 2-7: Tests – Bending moment (IEC 61300-2-7)
EN 61300-2-12:2009	Part 2-12: Tests – Impact (IEC 61300-2-12:2009)
EN 61300-2-17	Part 2-17: Tests – Cold (IEC 61300-2-17)
EN 61300-2-18	Part 2-18: Tests – Dry heat – High temperature endurance (IEC 61300-2-18)
EN 61300-2-22	Part 2-22: Tests – Change of temperature (IEC 61300-2-22)
EN 61300-2-26	Part 2-26: Tests – Salt mist (IEC 61300-2-26)
EN 61300-2-27	Part 2-27: Tests – Dust – Laminar flow (IEC 61300-2-27)
EN 61300-2-42	Part 2-42: Tests – Static side load for connectors (IEC 61300-2-42)
EN 61300-2-44	Part 2-44: Tests – Flexing of the strain relief of fibre optic devices (IEC 61300-2-44)
EN 61300-2-46	Part 2-46: Tests – Damp heat cyclic (IEC 61300-2-46)
EN 61300-3-6:2009	Part 3-6: Examinations and measurements – Return loss (IEC 61300-3-6:2009)
EN 61300-3-10	Part 3-10: Examinations and measurements – Gauge retention force (IEC 61300-3-10)
EN 61300-3-15	Part 3-15: Examinations and measurements – Dome eccentricity of a convex polished ferrule endface (IEC 61300-3-15)
EN 61300-3-16	Part 3-16: Examinations and measurements – Endface radius of spherically polished ferrules (IEC 61300-3-16)
EN 61300-3-23	Part 3-23: Examination and measurements – Fibre position relative to ferrule endface (IEC 61300-3-23)
EN 61300-3-28	Part 3-28: Examinations and measurements – Transient loss (IEC 61300-3-28)
EN 61300-3-34	Part 3-34: Examinations and measurements – Attenuation of random mated connectors (IEC 61300-3-34)
EN 61300-3-42	Part 3-42: Examinations and measurements – Attenuation of single mode alignment sleeves and or adaptors with resilient alignment sleeves (IEC 61300-3-42)
EN 61753-1	Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards (IEC 61753-1)
EN 61754-23	Fibre optic connector interfaces – Part 23: Type LX.5 connector family (IEC 61754-23)
ISO 8015	Technical drawings – Fundamental tolerancing principle