SVENSK STANDARD SS-EN 61753-121-2

| Fastställd | Utgåva | Sida | Ansvarig kommitté |
|---|---|---|---|
| 2018-02-21 | 2 | 1 (1+21) | SEK TK 86 |




# Fiberoptik – Funktionsfordringar på anslutningsdon och passiva komponenter – Del 121-2: Anslutningskablar för simplex och duplex med singelmodfiber och anslutningsdon med cylindrisk ferrul för kategori C – Kontrollerad miljö

*Fibre optic interconnecting devices and passive components – Performance standard – Part 121-2: Simplex and duplex cords with single-mode fibre and cylindrical ferrule connectors for category C – Controlled environment*

Som svensk standard gäller europastandarden EN 61753-121-2:2017. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61753-121-2:2017.

**Nationellt förord**

Europastandarden EN 61753-121-2:2017

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC

– **IEC 61753-121-2, Second edition, 2017 - Fibre optic interconnecting devices and passive components - Performance standard - Part 121-2: Simplex and duplex cords with single-mode fibre and cylindrical ferrule connectors for category C - Controlled environment**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61753-121-2, utgåva 1, 2010, gäller ej fr o m 2020-10-20.

ICS 33.180.20

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: Box 1284, 164 29 KISTA
Telefon: 08 - 444 14 00.
E-post: sek@elstandard.se. Internet: www.elstandard.se

## *Standarder underlättar utvecklingen och höjer elsäkerheten*

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

## *SEK är Sveriges röst i standardiseringsarbetet inom elområdet*

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

## *Stora delar av arbetet sker internationellt*

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

## *Var med och påverka!*

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard
Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 61753-121-2

October 2017

ICS 33.180.20

Supersedes EN 61753-121-2:2010

English Version

# Fibre optic interconnecting devices and passive components - Performance standard - Part 121-2: Simplex and duplex cords with single-mode fibre and cylindrical ferrule connectors for category C - Controlled environment (IEC 61753-121-2:2017)

Dispositifs d'interconnexion et composants passifs fibroniques - Norme de performance - Partie 121-2: Cordons simplex et duplex avec fibres unimodales, munis de connecteurs à férule cylindrique pour catégorie C - Environnement contrôlé (IEC 61753-121-2:2017)

Lichtwellenleiter - Verbindungselemente und passive Bauteile -Betriebsverhalten - Teil 121-2: Simplex- und Duplexkabel mit Einmoden-Lichtwellenleiter-Steckverbindern mit zylindrischen Ferrulen für die Kategorie C - Kontrollierte Umgebung (IEC 61753-121-2:2017)




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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**



Ref. No. EN 61753-121-2:2017 E

SEK Svensk Elstandard

## European foreword

The text of document 86B/4076/FDIS, future edition 2 of IEC 61753-121-2, prepared by SC 86B "Fibre optic interconnecting devices and passive components" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61753-121-2:2017.

The following dates are fixed:

| | | |
|---|---|---|
| • latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2018-04-20 |
| • latest date by which the national standards conflicting with the document have to be withdrawn | (dow) | 2020-10-20 |

This document supersedes EN 61753-121-2:2010.

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

## Endorsement notice

The text of the International Standard IEC 61753-121-2:2017 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

| | | |
|---|---|---|
| IEC 60794-1-2:2017 | NOTE | Harmonized as EN 60794-1-2:2017 (not modified). |
| IEC 60794-2 | NOTE | Harmonized as EN 60794-2. |
| IEC 61300 Series | NOTE | Harmonized as EN 61300 Series. |
| IEC 61753 Series | NOTE | Harmonized as EN 61753 Series. |
| IEC 61756-1 | NOTE | Harmonized as EN 61756-1. |

# Annex ZA
(normative)

## Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| IEC 60793-2-50 | - | Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres | EN 60793-2-50 | - |
| IEC 60794-2-50 | - | Optical fibre cables - Part 2-50: Indoor cables - Family specification for simplex and duplex cables for use in terminated cable assemblies | EN 60794-2-50 | - |
| IEC 60794-2-51 | - | Optical fibre cables - Part 2-51: Indoor cables - Detail specification for simplex and duplex cables for use in cords for controlled environment | EN 60794-2-51 | - |
| IEC 61300-1 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 1: General and guidance | EN 61300-1 | - |
| IEC 61300-2-4 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-4: Tests - Fibre/cable retention | EN 61300-2-4 | - |
| IEC 61300-2-22 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-22: Tests - Change of temperature | EN 61300-2-22 | - |
| IEC 61300-2-42 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-42: Tests - Static side load for strain relief | EN 61300-2-42 | - |
| IEC 61300-2-44 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-44: Tests - Flexing of the strain relief of fibre optic devices | EN 61300-2-44 | - |

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| IEC 61300-3-1 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-1: Examinations and measurements - Visual examination | EN 61300-3-1 | - |
| IEC 61300-3-3 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-3: Examinations and measurements - Active monitoring of changes in attenuation and return loss | EN 61300-3-3 | - |
| IEC 61300-3-6 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-6: Examinations and measurements - Return loss | EN 61300-3-6 | - |
| IEC 61300-3-22 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-22: Examinations and measurements - Ferrule compression force | EN 61300-3-22 | - |
| IEC 61300-3-25 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-25: Examinations and measurements - Concentricity of non-angled ferrules and non-angled ferrules with fibre installed | EN 61300-3-25 | - |
| IEC 61300-3-26 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-26: Examinations and measurements - Measurement of the angular misalignment between fibre and ferrule axes | EN 61300-3-26 | - |
| IEC 61300-3-28 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-28: Examinations and measurements - Transient loss | EN 61300-3-28 | - |
| IEC 61300-3-34 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-34: Examinations and measurements - Attenuation of random mated connectors | EN 61300-3-34 | - |
| IEC 61300-3-35 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-35: Examinations and measurements - Visual inspection of fibre optic connectors and fibre-stub transceivers | EN 61300-3-35 | - |

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| IEC 61300-3-47 | - | Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-47: Examinations and measurements - Endface geometry of PC/APC spherically polished ferrules using interferometry | EN 61300-3-47 | - |
| IEC 61753-1 | - | Fibre optic interconnecting devices and passive components performance standard - Part 1: General and guidance for performance standards | EN 61753-1 | - |
| IEC 61753-021-2 | - | Fibre optic interconnecting devices and passive components performance standard - Part 021-2: Grade C/3 single-mode fibre optic connectors for category C - Controlled environment | EN 61753-021-2 | - |
| IEC 61754 | Series | Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces | EN 61754 | Series |
| IEC 61755 | Series | Fibre optic interconnecting devices and passive components - connector optical interfaces | EN 61755 | Series |
| IEC/TR 61931 | - | Fibre optic - Terminology | - | - |

# CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

# FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – PERFORMANCE STANDARD –

## Part 121-2: Simplex and duplex cords with single-mode fibre and cylindrical ferrule connectors for category C – Controlled environment

## FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61753-121-2 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2010. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) merge an optical performance requirement of a reference cord;

b) delete Annexes D and E due to updated relevant standard document;

c) modify the whole document structure according to the latest ISO/IEC Directives.

The text of this International Standard is based on the following documents:

| FDIS | Report on voting |
|---|---|
| 86B/4076/FDIS | 86B/4084/RVD |

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of IEC 61753 series, published under the general title *Fibre optic interconnecting devices and passive components – Performance standard*, can be found on the IEC website.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

# FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – PERFORMANCE STANDARD –

## Part 121-2: Simplex and duplex cords with single-mode fibre and cylindrical ferrule connectors for category C – Controlled environment

## 1 Scope

This part of IEC 61753 specifies the test requirements for cords including reference cords used in a controlled (Category C) environment according to IEC 61753-1, where the connectors already comply with the Category C requirements of IEC 61753-1. The tests selected are a subset of the connector tests from IEC 61753-1 appropriate for requalification with additional requirements relevant to cords and the connector/cable interface.

The cords consist of simplex or duplex fibre optic cable terminated at each end of the cable with single-mode fibre optic connector plugs with cylindrical ferrules. The operational wavelength range is between 1 260 nm and 1 625 nm. Short length cords are used as test samples as the attenuation of the cord and the temperature cycling performance will be affected by longer lengths of cable. It is important that any qualification of a cord whose length is greater than 5 m takes these factors into account.

The relevant requirements for the mechanical interface of connector sets are covered by the IEC 61754 all parts. The relevant requirements for the optical interface of connector sets are covered by IEC 61755 (all parts). The relevant requirements for performance of connector sets are covered by IEC 61753 (all parts). The relevant requirements for fibres are covered by IEC 60793-2-50. The relevant requirements for cables for cords are covered by IEC 60794-2-50.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 60793-2-50, *Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres*

IEC 60794-2-50, *Optical fibre cables – Part 2-50: Indoor cables – Family specification for simplex and duplex cables for use in terminated cable assemblies*

IEC 60794-2-51, *Optical fibre cables – Part 2-51: Indoor cables – Detail specification for simplex and duplex cables for use in cords for controlled environment*

IEC 61300-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 1: General and guidance*

IEC 61300-2-4, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-4: Tests – Fibre/cable retention*

IEC 61300-2-22, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-22: Tests – Change of temperature*

IEC 61300-2-42, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-42: Tests – Static side load for strain relief*

IEC 61300-2-44, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 2-44: Tests – Flexing of the strain relief of fibre optic devices*

IEC 61300-3-1, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-1: Examinations and measurements – Visual examination*

IEC 61300-3-3, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-3: Examinations and measurements – Active monitoring of changes in attenuation and return loss*

IEC 61300-3-6, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-6: Examinations and measurements – Return loss*

IEC 61300-3-22, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-22: Examinations and measurements – Ferrule compression force*

IEC 61300-3-25, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-25: Examinations and measurements – Concentricity of non-angled ferrules and non-angled ferrules with fibre installed*

IEC 61300-3-26, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-26: Examinations and measurements – Measurement of the angular misalignment between fibre and ferrule axes*

IEC 61300-3-28, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-28: Examinations and measurements – Transient loss*

IEC 61300-3-34, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-34: Examinations and measurements – Attenuation of random mated connectors*

IEC 61300-3-35, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-35: Examinations and measurements – Visual inspection of fibre optic connectors and fibre-stub transceivers*

IEC 61300-3-47, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-47: Examinations and measurements – End face geometry of PC/APC spherically polished ferrules using interferometry*

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

IEC 61753-021-2, *Fibre optic interconnecting devices and passive components – Performance standard – Part 021-2: Grade C/3 single-mode fibre optic connectors for category C – Controlled environment*

IEC 61754 (all parts), *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces*

IEC 61755 (all parts), *Fibre optic interconnecting devices and passive components – Connector optical interfaces*

IEC TR 61931, *Fibre optic – Terminology*