Fibre optic interconnecting devices and passive components - Connector optical interfaces - Part 2-5: Connection parameters of non-dispersion shifted single-mode physically contacting fibres - Angled for reference connection applications

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NATIONAL FOREWORD

See Eesti standard EVS-EN 61755-2-5:2015 sisaldab Euroopa standardi EN 61755-2-5:2015 ingliskeelset teksti.	This Estonian standard EVS-EN 61755-2-5:2015 consists of the English text of the European standard EN 61755-2-5:2015.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 20.02.2015.	Date of Availability of the European standard is 20.02.2015.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Fibre optic interconnecting devices and passive components - Connector optical interfaces - Part 2-5: Connection parameters of non-dispersion shifted single-mode physically contacting fibres - Angled for reference connection applications (IEC 61755-2-5:2015)

Dispositifs d'interconnexion et composants passifs à fibres optiques - Interfaces optiques de connecteurs pour fibres optiques - Partie 2-5: Connexion de fibres unimodales à dispersion non décalée en contact physique avec angle, avec polissage, pour applications en tant que connecteurs de référence
(IEC 61755-2-5:2015)

Lichtwellenleiter - Verbindungselemente und passive Bauteile -Optische Schnittstellen von Lichtwellenleiter-Steckverbindern - Teil 2-4: Optische Schnittstelle von nicht-dispersionsverschobenen, abgeschrägten Einmodenfasern mit physikalischem Kontakt für die Anwendung mit Referenzsteckverbindern
(IEC 61755-2-5:2015)

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

The text of document 86B/3846/FDIS, future edition 1 of IEC 61755-2-5, 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 61755-2-5:2015.

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)	2015-11-12
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2018-02-12

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Endorsement notice

The text of the International Standard IEC 61755-2-5:2015 was approved by CENELEC as a European Standard without any modification.

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Part 2-5: Connection parameters of non-dispersion shifted single-mode physically contacting fibres – Angled for reference connection applications

1 Scope

This part of IEC 61755 defines a set of prescribed conditions that should be maintained in order to satisfy the requirements of angled polished reference connections.

The prescribed conditions include dimensional limits and optical fibre requirements of the optical interface to meet specific requirements for reference connection (plugs and adaptors) used for attenuation measurements.

Two different grades for reference connections are defined in this standard. The use of each of these grades depends on the application and on the targeted attenuation measurement uncertainty. The model uses a Gaussian distribution of light intensity over the specified restricted mode field diameter (MFD) range.

This standard is intended to be used for shipping and acceptance inspections.

The reference connector plug is specified for B1.1, B1.3 and B6 fibres as specified in IEC 60793-2-50.

The use of the reference connector plug would not be recommended where classification of fibre is difficult, for example construction and maintenance of cable plant.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 61300-3-4, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-4: Examinations and measurements – Attenuation*

IEC 61300-3-42, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-42: Examinations and measurements – Attenuation of single mode alignment sleeves and or adaptors with resilient alignment sleeves*

IEC 61755-2-1, *Fibre optic interconnecting devices and passive components –Connector optical interfaces – Part 2-1: Connection parameters of non-dispersion shifted single-mode physically contacting fibres – Non-angled*

IEC 61755-2-2, *Fibre optic interconnecting devices and passive components –Connector optical interfaces – Part 2-2: Connection parameters of non-dispersion shifted single-mode physically contacting fibres – Angled*

IEC 61755-3 (all parts), *Fibre optic interconnecting devices and passive components – Connector optical interfaces – Part 3-x: Connector parameters of non-dispersion shifted single-mode physically contacting fibres*

IEC TR 62627-04, *Fibre optic interconnecting devices and passive components – Technical report – Part 04: Example of uncertainty calculation: Measurement of the attenuation of an optical connector.*

3 Performance grades

Performance grades for APC polished reference connectors are given in Table 1. The specified attenuation for each grade is obtained when the reference plugs are connected to each other with the reference adaptor.

Table 1 – Single-mode attenuation grades at 1 310 nm (dB)

Reference grade [a]	**Attenuation** [a] dB	**Contribution to measurement uncertainty** [b] dB
R1	≤0,1	±0,1
R2	≤0,2	±0,2

[a] Under the assumption of worst case alignment with identical connector plug. Expected attenuation measured when connecting two plugs of the same grade may be higher due to significant measurement uncertainty

[b] As described in Clause 8.

4 Description

Optical reference connector plugs are connector plugs manufactured with restricted tolerances for dimensions relevant to lateral and angular offset. These connector plugs are used for attenuation measurement purposes according to IEC 61300-3-4, and shall be considered as part of the measurement set-up since they strongly contribute to its measurement uncertainty (for example see IEC TR 62627-04). The attenuation measurement uncertainty contributions for both grades of reference connectors are listed in Table 3.

The principal performance of a reference connector plug is given by its contribution to measurement uncertainty (estimated based on the reproducibility of an attenuation measurement of the same device performed using multiple different reference connector plugs of the same grade) which is determined by the accuracy with which the core of the optical fibre is aligned to the optical datum target and determines the random attenuation performance of a reference connector population.

The main parameters influencing the performance of the reference connector plugs are fibre core location, fibre core axis angle and mode field diameter variability. Figure 1 represents the fibre alignment tolerances for the two different reference grades described in this standard, under the assumption of using selected reference fibre, described in Table 2.

The design curves given in Figure 1 each represent maximum allowable combinations of a given specific fibre core location and an associated fibre core axis angle to not exceed the specified attenuation of any single considered connection. The design curves shown represent the determination of the parameters under a worst case mismatch of the mode field diameter of the selected fibres as given in Table 3, i.e. 9,1/9,3 μm and a wavelength of 1