



INTERNATIONAL STANDARD



**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**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.180.20

ISBN 978-2-8322-2194-5

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD	3
1 Scope	5
2 Normative references	5
3 Performance grades	6
4 Description	6
5 Criteria for a fit within performance grades	7
5.1 General.....	7
5.2 Attenuation grades and criteria	7
6 Use of selected fibre to assemble reference connector plugs.....	9
7 Reference adaptor	9
8 Attenuation measurement uncertainty contribution.....	9
Annex A (informative) Example of determination of the attenuation measurement uncertainty.....	10
Figure 1 – Representation of fibre core position of single connector plug under the assumption of worst case alignment with identical connector plug.....	8
Figure A.1 – Attenuation measurement uncertainty contribution for Grade 1 reference connectors	10
Table 1 – Single-mode attenuation grades at 1 310 nm (dB)	6
Table 2 – Mode field diameter and fibre core nominal index of refraction for fibre to be used in reference connector plugs	7
Table 3 – Measurement uncertainty contribution of reference connectors	9

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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**

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 61755-2-5 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

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

FDIS	Report on voting
86B/3846/FDIS	86B/3867/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 been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61755 series, published under the general title *Fibre optic interconnecting devices and passive components – Connector optical interfaces*, 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 stability 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

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- withdrawn,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

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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

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.*