



IEC 61300-3-47

Edition 1.0 2014-07

INTERNATIONAL STANDARD



**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**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

PRICE CODE



ICS 33.180.20

ISBN 978-2-8322-1708-5

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

CONTENTS

FOREWORD	3
1 Scope	5
2 Terms and definitions	5
3 Measurement by interferometer	7
3.1 General.....	7
3.2 Ferrule/connector holder	7
3.3 Optical interferometric system.....	8
3.4 Microscope with camera.....	8
4 Requirements for the interferometer	8
4.1 XY calibration (radius of curvature)	8
4.2 Z calibration (fibre height)	8
4.3 Alignment of ferrule axis with the interferometer's optical axis (apex offset calibration).....	8
4.4 Tilt and key angle	8
5 Measurement method	8
5.1 General.....	8
5.2 Measurement regions	9
5.3 Measurement procedure for the radius of curvature	9
5.4 Measurement procedure for the dome eccentricity (apex offset).....	10
5.5 Measurement procedure for fibre height.....	10
6 Details to be specified	13
Annex A (normative) Calibration for the interferometer.....	14
A.1 XY calibration	14
A.2 Z calibration	14
A.3 Alignment of the ferrule axis with the optical axis of the interferometer (“apex offset calibration”).....	14
A.4 Tilt and key angle	14
Annex B (informative) Measurement procedure for end face “angle error” of angled convex polished ferrules	15
Annex C (informative) Formula for calculating ferrule end face geometry	17
Figure 1 – Radius of curvature of a spherically polished ferrule end face	5
Figure 2 – Apex offset of a spherically polished ferrule end face	6
Figure 3 – Fibre height of a spherically polished ferrule end face	6
Figure 4 – Ferrule end face angle for spherically polished ferrules	7
Figure 5 – Interferometer	7
Figure 6 – Ferrule end face and measurement regions	9
Figure 7 – Ferrule end face surface	11
Figure 8 – Fitting region and averaging region of the ferrule end face surface	11
Figure 9 – Converted end face surface of the ferrule.....	12
Figure 10 – Converted ferrule end face surface without the extracting region.....	12
Figure B.1 – Example of key error calculated from interference pattern for a convex polished ferrule	15

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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**

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 61300-3-47 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This standard merges IEC 61300-3-15, IEC 61300-3-16, IEC 61300-3-17 and IEC 61300-3-23. After publication of this standard IEC 61300-3-15, IEC 61300-3-16, IEC 61300-3-17 and IEC 61300-3-23 will be withdrawn.

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

FDIS	Report on voting
86B/3773/FDIS	86B/3805/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 61300 series, published under the general title, *Fibre optic interconnecting and passive components – Basic test and measurement procedures*, can be found on the IEC website.

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 –
BASIC TEST AND MEASUREMENT PROCEDURES –**

**Part 3-47: Examinations and measurements –
End face geometry of PC/APC spherically
polished ferrules using interferometry**

1 Scope

This part of IEC 61300 describes a procedure to measure the end face geometry of a spherically polished ferrule or connector. Within this standard the words “ferrule” and “connector” can be used interchangeably.