IEC 61300-3-30

Edition 3.0 2026-07

INTERNATIONAL STANDARD

REDLINE VERSION

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures -
Part 3-30: Examinations and measurements - Endface geometry of rectangular ferrule

ICS 33.180.20

ISBN 978-2-8327-1420-1

IEC 61300-3-30:2026-07 RLV(en)

THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2026 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

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

CONTENTS

FOREWORD 3
1 Scope 1
2 Normative references 5
3 Terms and definitions 5
4 General description 5
5 Measurement regions 6
6 Apparatus 8
6.1 General 8
6.2 Ferrule holder 9
6.3 Positioning stage 9
6.4 Three-dimensional interferometry analyser 10
7 Procedure 10
8 Details to be specified and reported 12
Annex A (normative) Formulae for approximating the endface geometry 14
A.1 Approximation of the ferrule surface 14
A.2 Approximation of the fibre tip radii 14
Annex B (normative) Surface angle sign convention (shown graphically) 15
Annex C (normative) Fibre counting convention (shown graphically) 17
Annex D (normative) Minus coplanarity and fibre plane angle determination 18
D.1 Overview 18
D.1.1 General 18
D.1.2 Minus coplanarity 18
D.1.3 Fibre plane X-axis and Y-axis angles 18
D.2 Method for analysis 18
D.2.1 Single row ferrules 18
D.2.2 Multi-row ferrules 19
~~D.3 Documentation~~ .....
Annex E (normative) Calculation of core dip using the paraboloid method 20
E.1 General 20
E.2 Method for analysis 20
Annex F (normative) Calculation of GL parameter 22
F.1 General 22
F.2 Method for analysis 22
Bibliography 25

Figure 1 – Measurement regions on ferrule and fibre 7
Figure 2 – Measurement setup 9
Figure B.1 – Surface angle sign convention 16
Figure C.1 – Fibre counting convention 17
Figure D.1 – Illustration of fibre line and minus coplanarity parameters 18
Figure E.1 – Paraboloid fit to a fibre endface exhibiting core dip 21

Table 1 – Ferrule measurement areas and parameters 8
Table F.1 – Parameter constants for 4-fibre ferrules 23

Table F.2 – Parameter constants for 8-fibre ferrules 24
Table F.3 – Parameter constants for 12-fibre ferrules 24

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-30: Examinations and measurements - Endface geometry of rectangular ferrule

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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61300-3-30:2020. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 61300-3-30 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics. It is an International Standard.

This third edition cancels and replaces the second edition published in 2020. This edition constitutes a technical revision.

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

a) clarification of region diameter symbols;
b) introduction of x116 and x132 region of interest (ROI) to support MT-16 and MT-32 ferrule types;
c) preparation of geometry limit (GL) parameter tables for 16-, 24- and 32-fibre ferrules;
d) clarification of the neighbouring fibres definition when computing adjacent height;
e) improvement of figures in Annexes.

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

Draft	Report on voting
86B/5224/FDIS	86B/5250/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

A list of all parts in the IEC 61300 series, published under the general title *Fibre optic interconnecting devices and passive components*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

– reconfirmed,
– withdrawn, or
– revised.

1 Scope

This part of IEC 61300 describes a method for measuring the endface geometry of rectangular multifibre ferrules having an IEC defined optical interface. The primary attributes are fibre position relative to the endface, ~~either withdrawal or protrusion,~~ endface angle relative to the guide ~~pin bores~~ holes, fibre tip radii and core dip for multimode fibres.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

– IEC Electropedia: available at https://www.electropedia.org/

– ISO Online browsing platform: available at https://www.iso.org/obp

4 General description

Guide pin based multifibre connector plugs in IEC 61754-5 and all parts of IEC 61754-7 typically have a rectangular endface with a long axis and a short axis. Ideally a flat polish is desired on the endface with the fibres protruding slightly and all in the same plane to assure physical contact of the fibre cores when two connectors are intermated. In practice, the endface typically has two different curvatures across the surface along the long and short axis. Since mated ferrules are aligned by pins in the guide holes, the endface of the ferrule shall be properly oriented (SX and SY angles) with respect to the guide holes to achieve positive contact. The endface angle SX in the long axis (X-axis) and the endface angle SY in the short axis (Y-axis) (as defined in Annex B) are measured by finding the best fit plane (P_J), based on a percentage of the highest points in a specified region of interest. The highest points typically show the greatest modulation from an interferometric standpoint. This allows for more robust measurements and greater repeatability between different interferometers.

The angle of the best fit plane P_J is calculated by comparing it to the reference plane P which is perpendicular to the averaged axis of ~~each~~ the guide holes. The height H (positive is a protrusion) of the fibres is a planar height defined as the distance between the fibre endface and the best fit plane. Core dip is only relevant to multimode fibres because the large core is softer than the cladding of the fibre and tends to polish away faster. Core dip is calculated using the paraboloid method described in Annex E.

One method is described for measuring the polish angle and fibre position for a single ferrule multifibre connector by analysing the endface with a three-dimensional interferometry type surface analyser.