

© Copyright SEK. Reproduction in any form without permission is prohibited.

**Fiberoptik –
Anslutningsdon och passiva komponenter –
Provning och mätning –
Del 3-35: Undersökning och mätning –
Visuell kontroll av anslutningsdon och
sändar-mottagarmoduler med fiberstumpar**

*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*

Som svensk standard gäller europastandarden EN 61300-3-35:2015. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61300-3-35:2015.

Nationellt förord

Europastandarden EN 61300-3-35:2015

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61300-3-35, Second edition, 2015 - 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**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61300-3-35, utgåva 1, 2010, gäller ej fr o m 2018-07-30.

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

English Version

**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 61300-3-35:2015)**

Dispositifs d'interconnexion et composants passifs à fibres
optiques - Procédures fondamentales d'essais et de
mesures - Partie 3-35: Examens et mesures - Examen
visuel des connecteurs à fibres optiques et des émetteurs-
récepteurs à embase fibrée
(IEC 61300-3-35:2015)

Lichtwellenleiter - Verbindungselemente und passive
Bauteile - Grundlegende Prüf- und Messverfahren - Teil 3-
35: Untersuchungen und Messungen - Visuelle Inspektion
von Lichtwellenleiter-Steckverbindern und Faser Stub-
Transceivern
(IEC 61300-3-35:2015)

This European Standard was approved by CENELEC on 2015-07-30. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

European foreword

The text of document 86B/3886/FDIS, future edition 2 of IEC 61300-3-35, 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 61300-3-35:2015.

The following dates are fixed:

- latest date by which the document has to be (dop) 2016-04-30
implemented at national level by
publication of an identical national
standard or by endorsement
- latest date by which the national (dow) 2018-07-30
standards conflicting with the
document have to be withdrawn

This document supersedes EN 61300-3-35:2010.

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

Endorsement notice

The text of the International Standard IEC 61300-3-35:2015 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 60825-2	NOTE	Harmonized as EN 60825-2
IEC 61300-1	NOTE	Harmonized as EN 61300-1
IEC 61755 (Series)	NOTE	Harmonized as EN 61755 (Series)

CONTENTS

FOREWORD	4
1 Scope	6
2 Normative references	6
3 Terms, definitions and abbreviations	6
3.1 Terms and definitions	6
3.2 Abbreviations	7
4 Measurement	7
4.1 General	7
4.2 Measurement conditions	7
4.3 Pre-conditioning	7
4.4 Recovery	7
5 Apparatus	8
5.1 Method A: Direct view optical microscopy	8
5.2 Method B: Video microscopy	8
5.3 Method C: Automated analysis microscopy	8
5.4 Certification requirements for low and high resolution systems	8
5.4.1 General	8
5.4.2 Requirement for low resolution microscope systems	8
5.4.3 Requirements for high resolution microscope systems	9
6 Procedure	9
6.1 Certification procedure	9
6.2 Inspection procedure	9
6.3 Visual requirements	10
Annex A (informative) Examples of inspected end faces with surface anomalies	13
Annex B (normative) Diagram of qualification artefact and method of manufacture	18
B.1 High resolution artefact	18
B.2 Low resolution artefact	20
Bibliography	21
Figure 1 – Inspection procedure flow	10
Figure A.1 – Example 1 (low resolution system)	13
Figure A.2 – Example 1 (high resolution system)	13
Figure A.3 – Example 2 (low resolution system)	14
Figure A.4 – Example 2 (high resolution system)	14
Figure A.5 – Example 3 (low resolution system)	14
Figure A.6 – Example 3 (high resolution system)	15
Figure A.7 – Example 4 (low resolution system)	15
Figure A.8 – Example 4 (high resolution system)	16
Figure A.9 – Example 5 (low resolution system)	16
Figure A.10 – Example 6 (low resolution system)	17
Figure B.1 – Example of nano-indentation test system	18
Figure B.2 – Example of high resolution artefacts	19
Figure B.3 – Example of low resolution artefact pattern	20

Table 1 – Visual requirements for single-mode PC polished connectors, $RL \geq 45$ dB	11
Table 2 – Visual requirements for single-mode angle polished (APC) connectors.....	11
Table 3 – Visual requirements for single-mode PC polished connectors, $RL \geq 26$ dB and single-mode transceivers using a fibre-stub interface	12
Table 4 – Visual requirements for multi-mode PC polished connectors.....	12

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**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**

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 61300-3-35 has been prepared by subcommittee SC86B: 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 2009 and constitutes a technical revision.

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

- a) modification to the title;
- b) addition of some terms and definitions;

- c) reconsideration of the specific values of Tables 1 to 4 to reflect the current market situation;
- d) addition of visual requirements for single-mode transceivers using a fibre-stub interface in Table 3;
- e) addition of a sentence in 4.1 concerning the susceptibility of the methods to system variability.

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

FDIS	Report on voting
86B/3886/FDIS	86B/3912/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 devices 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.

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 3-35: Examinations and measurements – Visual inspection of fibre optic connectors and fibre-stub transceivers

1 Scope

This part of IEC 61300 describes methods for quantitatively assessing the end face quality of a polished fibre optic connector or of a fibre optic transceiver using a fibre-stub type interface. Sub-surface cracks and fractures are not considered in this standard. In general, the methods described in this standard apply to 125 µm cladding fibres contained within a ferrule and intended for use with sources of ≤ 2 W of input power. However, portions are applicable to non-ferruled connectors and other fibre types. Those portions are identified where appropriate. It is not the intention of this standard that the size of scratches should be measured, the dimensions and requirements are selected such that they can be estimated. There is no need to measure for example if a scratch is 2,3 µm wide.

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.

Void.