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Interested committees:

Title: Draft BS EN 61280-1-4 Ed.3.0 Fibre optic communication subsystem test procedures. Part 1-4: General communication subsystems - Light source encircled flux measurement method.

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

- i) has any issues related to 3rd party IPR, patent or copyright
- ii) affects other national standard(s)
- iii) requires additional national guidance or information

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

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SUPERSEDES DOCUMENTS:

86C/1722/RR

IEC SC 86C : FIBRE OPTIC SYSTEMS AND ACTIVE DEVICES

SECRETARIAT:

United States of America

SECRETARY:

Mr Fred Heismann

OF INTEREST TO THE FOLLOWING COMMITTEES:

PROPOSED HORIZONTAL STANDARD:



Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

☐ EMC☐ ENVIRONMENT☒ QUALITY ASSURANCE☐ SAFETY

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Fibre optic communication subsystem test procedures - Part 1-4: General communication subsystems - Light source encircled flux measurement method

NOTE FROM TC/SC OFFICERS:

This CD was developed in a pilot project to test the new on-line authoring tool, which is to be introduced soon. The attached document was extracted from the on-line authoring tool, but its format is not completely compliant with the IEC document requirements. Please ignore any non-compliant formatting, since this is only a temporary document circulated for review and comments.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

Part 1-4: General communication subsystems - Light source encircled flux measurement method

FOREWORD

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IEC 61280-1-4 has been prepared by subcommittee 86C: Fibre optic systems and active devices, of IEC technical committee 86: Fibre optics. It is an International Standard.

This third edition cancels and replaces the second edition published in 2009. This edition constitutes a technical revision.

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

- a) Improvement of calibration procedure and calibration traceability;
- b) Improvement of fibre shaker description and requirements;
- c) Addition of pulsed light sources;
- d) Removal of poorly traceable calibration process using micropositioner.

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

Draft	Report on voting
86C/XX/FDIS	86C/XX/RVD

122 Full information on the voting for the approval of this standard can be found in the report on voting
123 indicated in the above table.

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

125 This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

126 A list of all parts of the IEC 61280 series can be found, under the general title *Fibre optic communication*
127 *subsystem test procedures*, on the IEC website.

128 The committee has decided that the contents of this publication will remain unchanged until the
129 maintenanceresult date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related
130 to the specific publication. At this date, the publication will be

- 131 • reconfirmed,
132 • withdrawn,
133 • replaced by a revised edition, or
134 • amended.

135

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 publication using a colour printer.

136

137

138

139

INTRODUCTION

140 ~~This part of IEC 61280~~ specifies how to measure the encircled flux of a multimode light source. Encircled
141 flux is a measure, as a function of radius, of the fraction of the total power radiating from a multimode
142 optical fibre's core.

143 The basic approach is to collect two-dimensional (2D) nearfield data, using a calibrated camera, and to
144 mathematically convert the 2D data into three normalized functions of radial distance from the fibre's
145 optical centre. The three functions are *intensity*, *incremental flux*, and *encircled flux*. The intensity
146 represents an optical power per surface area (in watts per square meter). The incremental flux
147 represents an optical power per radius differential (in watts per meter). Before normalisation, the
148 encircled flux represents an optical power (in watts).

149 These three radial functions are intended to characterize fibre optic laser sources either for use in
150 mathematical models predicting the minimum guaranteed length of a communications link, or to qualify a
151 lightsource to measure insertion loss in multimode links.

FIBRE OPTIC COMMUNICATION SUBSYSTEM TEST PROCEDURES –

Part 1-4: General communication subsystems - Light source encircled flux measurement method

1 Scope

This part of IEC 61280 establishes the characterization process of the encircled flux measurement method of light sources intended to be used with multimode fibre.

This international standard sets forth a procedure for the collection of two-dimensional fibre optic nearfield greyscale data and subsequent reduction to one-dimensional data expressed as a set of three sampled parametric functions of radius from the fibre's optical centre.

Estimation of the fibre core diameter is not an objective of this standard.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61745:2017, *End-face image analysis procedure for the calibration of optical fibre geometry test sets*

IEC 60793-2-10, *Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres*

IEC 60825-1, *Safety of laser products – Part 1: Equipment classification and requirements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

calibration light source

light source used to find the optical centre of a multimode fibre

3.2

centroid image

image used to determine the optical centre of the multimode fibre core

3.3

corrected image

image which has had a dark image subtracted from it and whose elements have had uniformity correction applied

3.4

dark image

image taken with the measured light source either turned off or not installed in the input port. Stray light and electrical signals of the detection system will remain in the dark image

3.5

image

two-dimensional rectangular array of numbers whose elements are pixels and whose pixel values linearly correspond to the optical power falling on the pixels

3.6

light source

something that emits light that is coupled into a fibre, the output of which can be measured (can be a calibration light source, a transmission light source or a light source used for attenuation measurements)