INTERNATIONAL STANDARD

IEC 61745

End-face image analysis procedure for the calibration of optical fibre geometry test sets

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For general terminology, readers are referred to IEC 60050: *International Electrotechnical Vocabulary* (IEV).

For graphical symbols, and letter symbols and signs approved by the IEC for general use, readers are referred to publications IEC 60027: *Letter symbols to be used in electrical technology*, IEC 60417: *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets* and IEC 60617: *Graphical symbols for diagrams.*

* See web site address on title page.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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END-FACE IMAGE ANALYSIS PROCEDURE FOR THE CALIBRATION OF OPTICAL FIBRE GEOMETRY TEST SETS

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.

3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61745 has been prepared by IEC technical committee 86: Fibre optics.

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

FDIS	Report on voting
86/125/FDIS	86/134/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.

Annex C forms an integral part of this standard.

Annexes A, B, D, E, F and G are for information only.

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

END-FACE IMAGE ANALYSIS PROCEDURE FOR THE CALIBRATION OF OPTICAL FIBRE GEOMETRY TEST SETS

1 General

1.1 Scope and object

In the research and production environments there exists a range of test methods for characterizing the geometry of optical fibres. Furthermore, each test method may determine one or more of the many parameters required for complete geometrical characterization. This International Standard describes the calibration of test sets which perform end-face image analysis, also known as near-field or grey-scale analysis. The principles, however, may be applied to test sets of a different type.

This standard addresses the calibration of measurements made on single-mode fibres only; however, this type of test set may also be used to measure the geometrical parameters of the cores of multimode fibres, but the evaluation of uncertainties associated with these measurements is beyond the scope of this standard.

The procedures outlined are to be performed by calibration laboratories and by the manufacturers or users of geometry test sets, for the purpose of calibrating geometry test sets and for evaluating the uncertainties in measurements made on calibrated test sets. The calibration of fibre coating or cable measurement test sets is not covered by this standard. The object of this standard is to define a standard procedure for the calibration of test sets for measuring the glass geometry of optical fibres.

1.2 Definitions

For the purpose of this International Standard, the following definitions apply.

1.2.1
accredited calibration laboratory
calibration laboratory authorised by the appropriate National Standards laboratory to issue calibration certificates with a specified uncertainty, which demonstrate traceability to national standards

1.2.2
artefact
any object that is measured on or used to calibrate a geometry test set. An artefact may be, for example, an optical fibre or a chromium-on-glass pattern

1.2.3
calibration
process by which the relationship between the values indicated by the geometry test set under calibration and the known values of the calibration standard is established. The purpose of calibration is to bring all geometry test sets into substantial agreement with a national standards laboratory. This may be performed either by adjustment of the geometry test set or by documentation of a calibration factor(s) in a calibration certificate. The pertaining environment and instrument conditions at the time of calibration are usually recorded. Calibration includes estimation of all uncertainties.

1.2.4
calibration chain
chain of transfers from a national standard to the geometry test set through intermediate or working standards (see figure 1)