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IEC 60793-1-41:2010

DRAFT TANZANIA STANDARD

(Draft for comments only)

Optical fibres - Part 1-41: Measurement methods and test procedures - Bandwidth

TANZANIA BUREAU OF STANDARDS

First Edition 2022

1 National Foreword

This draft Tanzania Standard is being prepared by the Telecommunications and Information Technology Technical Committee, under the supervision of the Electrotechnical divisional standards committee (EDC)

This draft Tanzania Standard is an adoption of the International Standard **IEC 60793-1-41:2019 Optical** *fibres - Part 1-41: Measurement methods and test procedures - Bandwidth,* which has been prepared by the International Organization for Standardization together with International Electrotechnical Commission

2 Terminology and conventions

Some terminologies and certain conventions are not identical with those used in Tanzania standards; attention is drawn especially to the following: -

1) The comma has been used as a decimal marker for metric dimensions. In Tanzania Standards, it is current practice to use “full point” on the baseline as the decimal marker.

2) Where the words “International Standard(s)” appear, referring to this standard they should read “Tanzania Standard(s)”.

IEC 60793-1-41

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Optical fibres –
Part 1-41: Measurement methods and test procedures – Bandwidth

Fibres optiques –
Partie 1-41: Méthodes de mesure et procédures d'essai – Largeur de bande

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FOREWORD

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International Standard IEC 60793-1-41 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This third edition cancels and replaces the second edition published in 2003. This edition constitutes a technical revision.

The main change with respect to the previous edition is the addition of a third method for determining modal bandwidth based on DMD data and to improve measurement procedures for A4 fibres.

This standard should be read in conjunction with IEC 60793-1-1 and IEC 60793-1-2, which cover generic specificati

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

FDIS	Report on voting
86A/1294/CDV	86A/1329/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 of the IEC 60793-1-4x series, published under the general title *Optical fibres – measurement methods and test 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.

OPTICAL FIBRES –

Part 1-41: Measurement methods and test procedures – Bandwidth

1 Scope

This part of IEC 60793 describes three methods for determining and measuring the modal bandwidth of multimode optical fibres (see IEC 60793-2- 10, IEC 60793-30 series and IEC 60793-40 series). The baseband frequency response is directly measured in the frequency domain by determining the fibre response to a sinusoidaly modulated light source. The baseband response can also be measured by observing the broadening of a narrow pulse of light. The calculated response is determined using differential mode delay (DMD) data. The three methods are:

- Method A – Time domain (pulse distortion) measurement
- Method B – Frequency-domain measurement
- Method C – Overfilled launch modal bandwidth calculated from differential mode delay (OMBc)

Methods A and B can be performed using one of two launches: an overfilled launch (OFL) condition or a restricted mode launch (RML) condition. Method C is only defined for A1a.2 (and A1a.3 in preparation) multimode fibre and uses a weighted summation of DMD launch responses with the weights corresponding to an overfilled launch condition. The relevant test method and launch condition should be chosen according to the type of fibre.

NOTE 1 These test methods are commonly used in production and research facilities and are not easily accomplished in the field.

NOTE 2 OFL has been used for the modal bandwidth value for LED-based applications for many years. However, no single launch condition is representative of the laser (e.g. VCSEL) sources that are used for gigabit and higher rate transmission. This fact drove the development of IEC 60793 -1- 49 for determining the effective modal bandwidth of laser optimized 50 µm fibres. See IEC 60793-2-10:2004 or later and IEC 61280-4-1:2003 or later for more information.

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 60793-1-20, *Optical Fibres – Part 1-20: Measurement methods and test procedures – Fibre geometry*

IEC 60793 -1-42, *Optical fibres – Part 1-42: Measurement methods and test procedures – Chromatic dispersion*

IEC 60793 -1-43, *Optical fibres – Part 1-43: Measurement methods and test procedures – Numerical aperture*

IEC 60793-1- 49:2006, Optical fibres – Part 1-49: *Measurement methods and test procedures – Differential mode delay*