SLOVENSKI STANDARD
oSIST prEN IEC 60793-1-46:2023

01-oktober-2023

Optična vlakna - 1-46. del: Merilne metode in postopki preskušanja - Nadzorovanje sprememb slabljenja

Optical fibres - Part 1-46: Measurement methods and test procedures - Monitoring of changes in attenuation

Fibres optiques - Partie 1-46: Méthodes de mesure et procédures d'essai - Contrôle des variations du facteur de transmission optique

Ta slovenski standard je istoveten z: **prEN IEC 60793-1-46:2023**

ICS:

33.180.10 (Optična) vlakna in kabli Fibres and cables

oSIST prEN IEC 60793-1-46:2023 **en**

86A/2334/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER:	
IEC 60793-1-46 ED2	
DATE OF CIRCULATION:	CLOSING DATE FOR VOTING:
2023-08-04	**2023-10-27**
SUPERSEDES DOCUMENTS:	
86A/2303/CD, 86A/2329A/CC	

IEC SC 86A : FIBRES AND CABLES	
SECRETARIAT:	SECRETARY:
France	Mr Laurent Gasca
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐
	Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED:	
☐ EMC ☐ ENVIRONMENT	☐ QUALITY ASSURANCE ☐ SAFETY
☒ SUBMITTED FOR CENELEC PARALLEL VOTING	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING
Attention IEC-CENELEC parallel voting The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	

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.

Recipients of this document are invited to submit, with their comments, notification of any relevant "In Some Countries" clauses to be included should this proposal proceed. Recipients are reminded that the CDV stage is the final stage for submitting ISC clauses. (SEE AC/22/2007 OR NEW GUIDANCE DOC).

TITLE:

Optical fibres - Part 1-46: Measurement methods and test procedures - Monitoring of changes in attenuation

PROPOSED STABILITY DATE: 2028

NOTE FROM TC/SC OFFICERS:

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

____

OPTICAL FIBRES –

Part 1-46: Measurement methods and test procedures – Monitoring of changes in attenuation

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 specifications, 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 60793-1-46 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics.

This second edition cancels and replaces the first edition published in 2001 . This revision constitutes a technical revision.

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

a) inclusion of class C single mode intraconnection fibre;

b) replacement of ‘optical transmittance’ by ‘attenuation’;

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

FDIS	Report on voting
86A/xxx/FDIS	86A/xxx/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 3.

Annexes A and B form an integral part of this standard.

IEC 60793-1-1 and IEC 60793-1-2 cover generic specifications.

IEC 60793-1-4X consists of the following parts, under the general title: Optical fibres:

– Part 1-40: Measurement methods and test procedures – Attenuation
– Part 1-41: Measurement methods and test procedures – Bandwidth
– Part 1-42: Measurement methods and test procedures – Chromatic dispersion
– Part 1-43: Measurement methods and test procedures – Numerical aperture
– Part 1-44: Measurement methods and test procedures – Cut-off wavelength
– Part 1-45: Measurement methods and test procedures – Mode field diameter
– Part 1-46: Measurement methods and test procedures – Monitoring of changes in attenuation
– Part 1-47: Measurement methods and test procedures – Macrobending loss
– Part 1-48: Measurement methods and test procedures – Polarization mode dispersion
– Part 1-49: Measurement methods and test procedures – Differential mode delay

The committee has decided that the contents of this publication will remain unchanged until 20xx. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

INTRODUCTION

Publications in the IEC 60793-1 series concern measurement methods and test procedures as they apply to optical fibres.

Within the same series several different areas are grouped, as follows:

–

– IEC 60793- 1-20 to IEC 60793-1-29: Measurement methods and test procedures for dimensions
– IEC 60793- 1-30 to IEC 60793-1-39: Measurement methods and test procedures for mechanical characteristics
– IEC 60793- 1-40 to IEC 60793-1-49: Measurement methods and test procedures for transmission and optical characteristics
– IEC 60793-1-50 to IEC 60793-1-59: Measurement methods and test procedures for environmental characteristics.
– IEC 60793-1-60 to IEC 60793-1-69: Measurement methods and test procedures for polarization-maintaining fibres.

OPTICAL FIBRES –

Part 1-46: Measurement methods and test procedures – Monitoring of changes in attenuation

1 Scope

This part of IEC 60793 establishes uniform requirements for the monitoring of changes in attenuation, thereby assisting in the inspection of fibres and cables for commercial purposes.

This standard gives two methods for monitoring the changes in attenuation of optical fibres and cables that occur during mechanical or environmental testing, or both. It provides a monitor in the change of attenuation characteristics arising from optical discontinuity, physical defects and modifications of the attenuation slope:

– method A: change in attenuation by transmitted power;
– method B: change in attenuation by backscattering.

Methods A and B apply to the monitoring of all categories of the following fibres:

– class A: multimode fibres;
– class B: single-mode fibres;
– class C: single-mode intraconnection fibres.

Information common to both measurements is contained in clauses 1 to 10, and information pertaining to each individual method appears in annexes A, and B respectively.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60793-1-40, *Optical fibres – Part 1-40: Measurement methods and test procedures – Attenuation*

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

4 Reference test method

There is not a reference test method indicated in this document.

5 Apparatus

Annexes A and B include layout drawings and other equipment requirements that individually apply for each of the methods, respectively.

6 Sampling and specimens

6.1 Specimen length

The minimum length of the specimen shall be such that the changes in attenuation are compatible with the resolution of the applicable test method (method A or method B), measurement apparatus, and the non-linearities at the beginning and end of it shall not affect the results.

6.2 Specimen end face

Prepare a flat end face, orthogonal to the fibre axis, at the input and output ends of each specimen.

6.3 Specimen preparation

Prepare the specimen as described in the appropriate mechanical, environmental, or other test method specified.

6.4 Reference specimen

In methods where a reference specimen is used, it shall comprise an identical kind of optical fibre or cable to the specimen and shall be linked between the optical divider and detector, as shown in figure A.1. It may be a short length of fibre. The condition of the reference specimen shall be constant during the whole test.

7 Procedure

For individual procedures, see appropriate annex: A and B, respectively.

8 Calculations

For calculation procedures, see the appropriate annex: A and B, respectively.

9 Results

9.1 Information to be provided with each measurement

Report the following information with each measurement:

– date and title of measurement;
– identification of specimen;
– optical source wavelength, λ;
– specimen length;
– conditions of the environment and measurement equipment;

– changes in attenuation, A_n; n = 1,2,3, … preferably plotted in a graph versus test parameters.

9.2 Information available upon request

The following information shall be available upon request:

– measurement method used: A or B;
– type of optical source used and its spectral width (FWHM);
– launching technique used;
– description of all key equipment;
– details of computation technique;
– date of latest calibration of measurement equipment.

10 Specification information

The detail specification shall specify the following information:

– type of fibre to be measured;
– failure or acceptance criteria;
– information to be reported;
– any deviations from the procedure that apply.