IEC 60794-1-111

Edition 1.0 2023-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Optical fibre cables –
Part 1-111: Generic specification – Basic optical cable test procedures – Mechanical tests methods – Bend, method E11

Câbles à fibres optiques –
Partie 1-111: Spécification générique – Procédures fondamentales d'essais des câbles optiques – Méthodes d'essai mécanique – Courbures, méthode E11



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CONTENTS

FOREWORD 3
INTRODUCTION 5
1 Scope 6
2 Normative references 6
3 Terms and definitions 6
4 General 6
4.1 Sample 6
4.2 Apparatus 7
4.3 Test methods 7
4.4 Test conditions 7
5 Method E11A – Bend as helix 7
5.1 General 7
5.2 Single-helix configuration 8
5.3 Two-helix configuration 9
5.4 Procedure 10
6 Method E11B – U bend 10
7 Requirements 11
8 Details to be specified 11
9 Details to be reported 12
Annex A (informative) Example of a special mandrel for two-helix configuration 13
Annex B (informative) Rationale for the options of an equal or larger turnaround loop diameter for the two-helix configuration of method E11A 14
Bibliography 19

Figure 1 – Bend test set-up for method E11A: single-helix configuration 8
Figure 2 – Bend test set-up for method E11A: two-helix configuration 9
Figure 3 – Bend test set-up for method E11B 11
Figure A.1 – Example of a special mandrel 13
Figure B.1 – Options for turnaround loop size for two-helix configuration of method E11A 14
Figure B.2 – Difference of change in attenuation for single-mode cable 17
Figure B.3 – Difference of change in attenuation for multimode cable 17
Figure B.4 – Worst case difference of change in attenuation 18

Table B.1 – Used change in attenuation values 15
Table B.2 – Calculated changes in attenuation of single-mode cable 15
Table B.3 – Calculated changes in attenuation of multimode cable 16

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OPTICAL FIBRE CABLES –

Part 1-111: Generic specification – Basic optical cable test procedures – Mechanical test methods – Bend, method E11

FOREWORD

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IEC 60794-1-111 has been prepared by subcommittee 86A: Fibres and cables, of IEC technical committee 86: Fibre optics. It is an International Standard.

This document partially cancels and replaces IEC 60794-1-21:2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC 60794-1-21:2015:

a) the nominal sample length was newly specified as 10 m between the cable element fixing points at both ends, unless otherwise specified;
b) the number of turns on the mandrel in Figure 1 for the single-helix configuration were corrected to match the number of turns shown in the figure for the two-helix configuration;

c) requirements on the turnaround loop were added for method E11A, two-helix configuration;

d) the turnaround loop with the same diameter as the mandrel was taken into account for calculation of the number of turns of each helix for method E11A, two-helix configuration;

e) added a formula for calculation of the number of revolutions in each helix for method E11A, two-helix configuration;

f) added a description for the procedure when the turnaround loop diameter is larger than the mandrel diameter for method E11A, two-helix configuration;

g) all the figures were updated and the different components labelled;

h) added the attenuation monitoring equipment in 4.2 for the apparatus and the description to measure the change in attenuation in the test methods E11A and E11B;

i) added Clause 9 for details to be reported;

j) added Annex A showing an example of a special mandrel to perform the bend test according to method E11A, two-helix configuration;

k) added Annex B providing the rationale for the options of method E11A, two-helix configuration.

The text of this International Standard is based on the following documents:

Draft	Report on voting
86A/2367/FDIS	86A/2373/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

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

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts in the IEC 60794 series, published under the general title *Optical fibre cables*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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INTRODUCTION

This document cancels and replaces method E11 of IEC 60794-1-21:2015, which will be withdrawn. It includes an editorial revision, based on the new structure and numbering system for optical fibre cable test methods. Additionally, technical changes were implemented. The mechanical tests contained in IEC 60794-1-21:2015 will be individually numbered in the IEC 60794-1-1xx series. Each test method is now considered to be an individual document rather than part of a multi-test method compendium. Full cross-reference details are given in IEC 60794-1-2.

The descriptions and the figures of the test methods in this document have been considerably changed to improve the procedures, avoid different interpretations and add useful information such as examples and rationale. However, the intention and procedures of the test methods were not changed.

OPTICAL FIBRE CABLES –

Part 1-111: Generic specification – Basic optical cable test procedures – Mechanical test methods – Bend, method E11

1 Scope

This part of IEC 60794 defines the test procedure to determine the ability of an optical fibre cable to withstand bending around a test mandrel. The primary purpose of this procedure is to measure the change in attenuation when the cable is bent around a test mandrel. A secondary purpose is to assess whether the cable has been physically damaged by bending.

NOTE 1 This test can be utilized at any specified temperature, including the low or high temperature limits for the cable.

NOTE 2 The bend test procedure for cable elements is specified in IEC 60794-1-301, method G1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60793-1-46, *Optical fibres – Part 1-46: Measurement methods and test procedures – Monitoring of changes in optical transmittance*

IEC 60794-1-1, *Optical fibre cables – Part 1-1: Generic specification – General*

IEC 60794-1-2, *Optical fibre cables – Part 1-2: Generic specification – Basic optical cable test procedures – General guidance*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60794-1-1 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 General

4.1 Sample

The nominal sample length shall be 10 m and the fibres, buffers, sheath(s) and any strength members shall be clamped, glued or otherwise fixed together at each end so that they do not move during the bend test, unless otherwise specified in the relevant specification. The actual sample length should be longer than the nominal sample length to allow for connection to the optical monitoring equipment. The section in the middle of the nominal sample length shall be bent.