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Optična vlakna - 1-33. del: Metode merjenja in preskusni postopki - Dovzetnost za napetostno korozijo (IEC 60793-1-33:2017)

Optical fibres - Part 1-33: Measurement methods and test procedures - Stress corrosion susceptibility (IEC 60793-1-33:2017)

Lichtwellenleiter - Teil 1-33: Messmethoden und Prüfverfahren - Spannungskorrosionsempfindlichkeit (IEC 60793-1-33:2017)

Fibres optiques - Partie 1-33: Méthodes de mesure et procédures d'essai - Résistance à la corrosion sous contrainte (IEC 60793-1-33:2017)

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Fibres optiques - Partie 1-33: Méthodes de mesure et procédures d'essai - Résistance à la corrosion sous contrainte (IEC 60793-1-33:2017)

Lichtwellenleiter - Teil 1-33: Messmethoden und Prüfverfahren - Spannungskorrosionsempfindlichkeit (IEC 60793-1-33:2017)

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European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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European foreword

The text of document 86A/1803/FDIS, future edition 1 of IEC 60793-1-33:2017, prepared by IEC/SC 86A "Fibres and cables", of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60793-1-33:2017.

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2018-06-20
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2020-09-20

This document supersedes EN 60793-1-33:2002.

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Endorsement notice

The text of the International Standard IEC 60793-1-33:2017 was approved by CENELEC as a European Standard without any modification.

IEC 60793-1-33

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colour inside

Optical fibres – Part 1-33: Measurement methods and test procedures – Stress corrosion susceptibility

Fibres optiques – Partie 1-33: Méthodes de mesures et procédures d'essai – Résistance à la corrosion sous contrainte

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 60793-1-33 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. It constitutes a technical revision.

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

a) removal of RTM;
b) changes to scope.

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

FDIS	Report on voting
86A/1803/FDIS	86A/1824/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

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

A list of all parts of the IEC 60793 series, published under the general title *Optical fibres*, 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 "http://webstore.iec.ch" in the data related to the specific document. At this date, the document 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.

INTRODUCTION

Annexes A, B, C, D, and E form an integral part of this document.

Annexes F, G, and H are for information only.

OPTICAL FIBRES –

Part 1-33: Measurement methods and test procedures – Stress corrosion susceptibility

1 Scope

This part of IEC 60793 contains descriptions of the five main test methods for the determination of stress corrosion susceptibility parameters.

The object of this document is to establish uniform requirements for the mechanical characteristic of stress corrosion susceptibility for silica-based fibres. Dynamic fatigue and static fatigue tests are used to determine the (dynamic) n_d value and (static) n_s value of stress corrosion susceptibility parameters. Currently, only the n_d-value is assessed against specification. Measured values greater than 18 per this procedure reflect the n_d-value of silica, which is approximately 20. Higher values will not translate to demonstrable enhanced fatigue resistance.

Silica fibre mechanical tests determine the fracture stress and fatigue properties under conditions that model the practical applications as closely as possible. The following test methods are used for determining stress corrosion susceptibility:

- A: Dynamic n_d value by axial tension;
- B: Dynamic n_d value by two-point bending;
- C: Static n_s value by axial tension;
- D: Static n_s value by two-point bending;
- E: Static n_s value by uniform bending.

These methods are appropriate for category A1, A2 and A3 multimode, class B single-mode fibres and class C intraconnecting single-mode fibres.

These tests provide values of the stress corrosion parameter, n, that can be used for reliability calculations according to IEC TR 62048 [18][1].

Information common to all methods is contained in Clauses 1 to 10, and information pertaining to each individual test method appears in Annexes A, B, C, D, and E.

Annexes F and G offer considerations for dynamic and static stress corrosion susceptibility parameter calculations, respectively; Annex H offers considerations on the different stress corrosion susceptibility parameter test methods.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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1 Numbers in square brackets refer to the Bibliography.

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 Overview of test methods

The following test methods are available:

– Dynamic n_d value by axial tension, see Annex A.
– Dynamic n_d value by two-point bending, see Annex B.
– Static n_s value by axial tension, see Annex C.
– Static n_s value by two-point bending, see Annex D.
– Static n_s value by uniform bending, see Annex E.

5 Reference test methods

At the time of this revision, no agreement could be reached in maintaining method A only as RTM in using it with some fibres equipped with modern coatings. Method A or B should be used to resolve disputes because they may be completed in a duration practical for dispute resolution.

6 Apparatus

See Annexes A, B, C, D, and E for each of the layout drawings and other equipment requirements for each of the methods.

7 Sampling and specimens

7.1 General

These measurements are statistical in nature. A number of specimens or samples from a common population are tested, each under several conditions.

Failure stress or time statistics for various sampling groups are used to calculate the stress corrosion susceptibility parameters.

7.2 Specimen length

Specimen length is contingent on the test procedure used. See Annexes A, B, C, D, and E for the length required for each test method. For tensile tests, the length ranges from 0,5 m to at most 5 m. For two-point bending tests, the actual length tested is less than 1 cm and for uniform bending tests, about 1 m.

7.3 Specimen preparation and conditioning

All of the test methods shall be performed under constant environmental conditions. Unless otherwise specified in the detail specification, the nominal temperature shall be in the range of 20 °C to 23 °C with a tolerance of ±2 °C for the duration of the test. Unless otherwise specified in the detail specification, the nominal relative humidity (RH) shall be in the range of 40 % to 60 % with a tolerance of ±5 % for the duration of the test.

Unless otherwise specified, all specimens shall be pre-conditioned in the test environment for a minimum period of 12 h.