SLOVENSKI STANDARD
SIST EN 62005-2:2002

01-september-2002

Reliability of fibre optic interconnecting devices and passive components - Part 2: Quantitative assessment of reliability based on accelerated ageing tests - Temperature and humidity, steady state (IEC 62005-2:2001)

Reliability of fibre optic interconnecting devices and passive components -- Part 2: Quantitative assessment of reliability based on accelerated ageing tests - Temperature and humidity; steady state

Zuverlässigkeit von LWL-Verbindungselementen und passiven Bauelementen -- Teil 2: Quantitative Beurteilung der Zuverlässigkeit auf der Basis von beschleunigten Alterungsprüfungen - Temperatur und Feuchte; konstant

Fiabilité des dispositifs d'interconnexion et des composants passifs à fibres optiques -- Partie 2: Evaluation quantitative de la fiabilité en fonction d'essais de viellissement accélérés - Température et humidité, régimes continus

Ta slovenski standard je istoveten z: **EN 62005-2:2001**

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English version

Reliability of fibre optic interconnecting devices and passive components Part 2: Quantitative assessment of reliability based on accelerated ageing tests - Temperature and humidity; steady state

(IEC 62005-2:2001)

Fiabilité des dispositifs d'interconnexion et des composants passifs à fibres optiques Partie 2: Evaluation quantitative de la fiabilité en fonction d'essais de vieillissement accélérés - Température et humidité, régimes continus
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(IEC 62005-2:2001)

This European Standard was approved by CENELEC on 2001-05-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

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Foreword

The text of document 86B/1438/FDIS, future edition 1 of IEC 62005-2, prepared by SC 86B, Fibre optic interconnecting devices and passive components, of IEC TC 86, Fibre optics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62005-2 on 2001-05-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2002-02-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2004-05-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 62005-2:2001 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 62005-4	1999	Reliability of fibre optic interconnecting devices and passive optical components Part 4: Product screening	EN 62005-4	1999

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Partie 2: Evaluation quantitative de la fiabilité en fonction d'essais de vieillissement accélérés – Température et humidité; régimes continus

Reliability of fibre optic interconnecting devices and passive components –

Part 2: Quantitative assessment of reliability based on accelerated ageing tests – Temperature and humidity; steady state

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RELIABILITY OF FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS –

Part 2: Quantitative assessment of reliability based on accelerated ageing tests – Temperature and humidity; steady state

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.
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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 62005-2 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

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

FDIS	Report on voting
86B/1438/FDIS	86B/1497/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.

IEC 62005 consists of the following parts, under the general title *Reliability of fibre optic interconnecting devices and passive components*

– Part 1: Introductory guide and definitions
– Part 2: Quantitative assessment of reliability based on accelerated ageing tests – Temperature and humidity; steady state
– Part 3: Relevant tests for evaluating failure modes and failure mechanisms for passive components
– Part 4: Product screening
– Part 5: Reliability accelerated tests to standardized service environments [1)]
– Part 6: Use of field data to determine, specify and improve component reliability [1)]
– Part 7: Life stress modelling [1)]

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

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

1) Under consideration.

INTRODUCTION

Investigations carried out on optical passive devices such as splitters indicate that their failure mechanisms accelerate with both temperature and humidity. In many of the proposed applications, particularly in the telecommunications local loop, devices are located in environments that are subject to both high temperature and potentially high humidity. Information about the accelerating effect of both temperature and humidity is therefore essential to ensure that the devices are fit for use.

A system designer has an overall target reliability for a system that can be divided into target reliabilities that cover all components in the system. The location of a particular component in a network will influence the target reliability. If a fault in a component does not cause loss of service, for example if the service switches to a back-up, the target reliability of that component may not be so stringent. There is however a second consideration, besides continuity of service provision, and that is the "maintenance burden". This is a measure of the time spent repairing a network and a service provider needs to ensure that this does not become economically non-viable. The allocation of target reliability to particular components is a process that requires experience of the behaviour of the components in particular environments. Failure of passive optical components appears to be dominated by wear out mechanisms; therefore, the failure rate is not constant with time. This means that information is required not only to provide the median time to failure (MTF) but also for the distribution of the failure rate with time.

A worked example which focuses on temperature and humidity is given but it should be remembered that other factors such as vibration or the presence of organic solvents may also reduce the time to failure. The choice of suitable life tests should be based on an understanding of the conditions in which the devices are deployed, together with knowledge of the potential failure mechanisms of the device. There may be some failure mechanisms that are not readily accelerated by typical stress conditions. In establishing standards, this part of IEC 62005 sets out the minimum requirements, while other standards to be published should be used to establish whether additional stress testing is required.

A further complication is random failure. These are failures that cannot be attributed to a wear-out mechanism. Random failures consequently occur at a constant rate in a population of devices and are often referred to as steady-state failures.

It should be noted that the life test programme defined by this standard has been found to be applicable to passive devices operating in conditions where the ambient temperature does not vary by more than ±15 °C from the mean value. It is only applicable to devices that have been specified according to the appropriate performance specification for the intended service conditions.

Devices that have dematable components or components that contain parts that rely on mechanical movement to perform correctly need additional life testing to ensure that the mechanical operation of the components remains correct throughout the lifetime of the component. The life test programme defined in this part of IEC 62005 still represents a significant part of the reliability information required for these components.

Components subjected to wider ranges of temperature variation or to other additional stresses such as vibration will also require additional life tests.