IEC 60825-2

Edition 4.0 2021-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Safety of laser products – Part 2: Safety of optical fibre communication systems (OFCSs)

Sécurité des appareils à laser – Partie 2: Sécurité des systèmes de télécommunications par fibres optiques (STFO)

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SAFETY OF LASER PRODUCTS –

Part 2: Safety of optical fibre communication systems (OFCSs)

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60825-2 has been prepared by IEC technical committee 76: Optical radiation safety and laser equipment.

This fourth edition cancels and replaces the third edition published in 2004, Amendment 1:2006 and Amendment 2:2010. This edition constitutes a technical revision.

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

a) Recommendations for individual components and subassemblies have been clarified; see Clause 1, paragraph 3.
b) C_7 has been revised in accordance with IEC 60825-1:2014, but with an additional limitation related to the skin MPE; see 4.7.2.
c) Condition 2 has been changed, and a detailed description of the measurement and determination method for hazard level has been added; see 4.7.1 and 4.7.2.
d) Annex B has been moved into 4.9. Annex F has been moved forward as Annex B.
e) Clause D.4 Hazard level evaluation examples – Additional examples have been added.
f) Clause D.5 Fault analysis – Explanation and guidance has been simplified.

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

FDIS	Report on voting
76/670/FDIS	76/674/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 in the IEC 60825 series, published under the general title *Safety of laser products*, 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.

INTRODUCTION

The objective of this document is to:

– protect people from optical radiation emitted by OFCSs;

– provide requirements for manufacturers, installation organizations, service organizations and operating organizations in order to establish procedures and supply information so that proper precautions can be adopted;

– ensure adequate warnings are provided to individuals regarding the potential hazards associated with OFCSs through the use of signs, labels and instructions.

Annex A gives a more detailed rationale for this document.

The safety of an OFCS depends to a significant degree on the characteristics of the equipment forming that system. Depending on the characteristics of the equipment, relevant safety information needs to be marked on the product or included within the instructions for use.

Where required by the level of potential hazard, the installation organization or end-user / operating organization or both are responsible for the safe deployment and use of OFCSs.

The installation organization and service organization are responsible for adherence to safety instructions during installation and service operations, respectively. The end-user or operating organization is responsible for adherence to safety instructions during operation and maintenance functions.

It is recognized that the user of this document can fall into one or more of the aforementioned categories of manufacturer, installation organization, end-user or operating organization.

SAFETY OF LASER PRODUCTS –

Part 2: Safety of optical fibre communication systems (OFCSs)

1 Scope

This document provides requirements and specific guidance for the safe operation and maintenance of optical fibre communication systems (OFCSs). In these systems, optical power is possibly accessible outside the confines of the transmitting equipment and/or at great distance from the optical source.

This document requires the assessment of hazard level at each accessible location of the OFCS as a replacement for product classification according to IEC 60825-1. It applies to the installed OFCS as an engineered, end-to-end assembly for the generation, transfer and receipt of optical radiation arising from lasers, light-emitting diodes (LEDs) or optical amplifiers, in which the transference is by means of optical fibre for communication and/or control purposes.

NOTE 1 Throughout this document, a reference to 'laser' is taken to include LEDs and optical amplifiers.

Individual components and subassemblies that fall under the definition of a laser product are subject to the applicable subclause(s) of IEC 60825-1. This document is applicable to individual components and subassemblies intended to be installed within OFCSs.

This document does not apply to optical fibre systems primarily designed to transmit optical power for applications such as material processing or medical treatment.

In addition to the hazards resulting from laser radiation, OFCSs possibly give rise to other hazards, such as fire.

This document does not address safety issues associated with explosion or fire with respect to OFCSs deployed in explosive atmospheres.

NOTE 2 The hazard presented by optical radiation emerging from a fibre is determined by the wavelength and power emerging from the fibre and also by the optical characteristics of the fibre itself (see Annex A).

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 60825-1:2014, *Safety of laser products – Part 1: Equipment classification and requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60825-1 and the following apply.