# IEC 60825-12

Edition 3.0 2022-12

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

colour inside

## Safety of laser products –
## Part 12: Safety of free space optical communication systems used for transmission of information

## Sécurité des appareils à laser –
## Partie 12: Sécurité des systèmes de communication optique en espace libre utilisés pour la transmission d'informations



IEC 60825-12:2022-12(en-fr)



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# SAFETY OF LASER PRODUCTS –

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## FOREWORD

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IEC 60825-12 has been prepared by IEC technical committee 76: Optical radiation safety and laser equipment. It is an International Standard.

This third edition cancels and replaces the second edition published in 2019. This edition constitutes a technical revision.

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

a) Where relevant and appropriate, references to IEC 60825-1 have been changed to a specific dated reference i.e. IEC 60825-1:2014.
b) Condition 2 has been changed from 7 mm aperture stop and 70 mm distance as follows,
   – For wavelengths less than 1 400 nm, 3,5 mm aperture stop and 35 mm distance,
   – For wavelengths equal to or greater than 1 400 nm, 3,5 mm aperture stop and 14 mm distance.

c) For wavelengths between 1 200 nm and 1 400 nm, an additional limitation is required equal to the equivalent radiant power of the skin MPE. $C_7$ has therefore been revised in accordance with IEC 60825-1:2014, but with this additional limitation related to the skin MPE; see 4.2.

d) Additional detail added regarding time base, see 4.8.

e) Additional clarification added to Clause 8 regarding the content and formatting of labels.

f) Annex A has been added, providing a rationale for the differences in approach between this document and IEC 60825-1:2014.

g) Annex B has been added, providing clarification of the meaning of the term "access level".

h) Worked examples have been added for a variety of scenarios; see Clauses C.2 to C.5.

i) Clause C.6 has been added on UAS, unmanned aerial systems.

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

| Draft | Report on voting |
|---|---|
| 76/717/FDIS | 76/722/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.

The list of all parts of the IEC 60825 series, published under the 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 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 document 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

The objective of this document is to:

– protect people from hazardous optical radiation emitted by FSOCSs;

– provide safety requirements and guidance for the design, manufacture and use of laser products or laser systems, which emit laser radiation for the purpose of free space optical data transmission;

– provide guidance for installation, operation, maintenance and service to assure the safe deployment and use of such laser systems.

This document only addresses the open beam portion of the laser product or laser system.

This document places the responsibility for certain product safety requirements, as well as requirements for providing appropriate information on how to use these systems safely, on the manufacturer of the system or the transmitters. It places the responsibility for the safe deployment and use of these systems on the installer or the operating organization. It places the responsibility for adherence to safety instructions during installation and service operations on the installation and service organizations as appropriate, and during operation and maintenance functions on the operating organization. It is recognized that the user of this document may fall into one or more of the categories of manufacturer, installer, service organization and/or operating organization as mentioned above.

Annex A gives a more detailed rationale for this document, and some examples are given in Annex C.