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Safety of laser products - Part 4: Laser guards

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/25

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English Version

**Safety of laser products - Part 4: Laser guards
(IEC 60825-4:2022)**Sécurité des appareils à laser - Partie 4: Protecteurs pour
lasers
(IEC 60825-4:2022)Sicherheit von Lasereinrichtungen - Teil 4:
Laserschutzwände
(IEC 60825-4:2022)

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EN IEC 60825-4:2024 (E)**European foreword**

The text of document 76/704/FDIS, future edition 3 of IEC 60825-4, prepared by TC 76 "Optical radiation safety and laser equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60825-4:2024.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2025-12-31
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2027-12-31

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For the relationship with EU Legislation, see informative Annex ZZ, which is an integral part of this document.

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Endorsement notice

The text of the International Standard IEC 60825-4:2022 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 60204-1	NOTE	Approved as EN 60204-1
IEC 61310-3	NOTE	Approved as EN 61310-3
IEC 61496-2	NOTE	Approved as EN IEC 61496-2
ISO/TR 7250-2	NOTE	Approved as CEN ISO/TR 7250-2
ISO 10218-1	NOTE	Approved as EN ISO 10218-1
ISO 14120	NOTE	Approved as EN ISO 14120

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60825-1	2014	Safety of laser products – Part 1: Equipment classification and requirements	EN 60825-1	2014
IEC 61508	series	Functional safety of electrical/electronic/programmable electronic safety-related systems	EN 61508-1:2010 EN 61508-2:2010 EN 61508-3:2010 EN 61508-4:2010 EN 61508-5:2010 EN 61508-6:2010 EN 61508-7:2010	2010 2010 2010 2010 2010 2010 2010
ISO 11553-1	-	Safety of machinery – Laser processing machines – Safety requirements	EN ISO 11553-1:2020 + A11	2020 2020
ISO 12100	-	Safety of machinery - General principles for design - Risk assessment and risk reduction	EN ISO 12100	2010
ISO 13849-1	-	Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design	EN ISO 13849-1	2023

EN IEC 60825-4:2024 (E)**Annex ZZ**
(informative)**Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered**

This European Standard has been prepared under a Commission's standardization request "M/396 Mandate to CEN and CENELEC for Standardisation in the field of machinery" to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast)

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Table ZZ.1 — Correspondence between this European Standard and Annex I of Directive 2006/42/EC

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.5.12	Clause 4.1	General design requirements
1.5.12	Clause 4.2	General performance requirements
1.5.12	Clause 4.3	Validation
1.5.12	Clause 4.4	User information
1.5.12	Clause 5.1	Special design requirements
1.5.12	Clause 5.2	Special performance requirements
1.5.12	Clause 5.3	Specification requirements
1.5.12	Clause 5.4	Testing and evaluation requirements
1.5.12	Clause 5.5	Labelling requirements
1.5.12	Clause 5.6	Additional user documentation
1.5.12	Appendix D (normative)	Test specifications

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

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Edition 3.0 2022-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Safety of laser products –
Part 4: Laser guards**

**Sécurité des appareils à laser –
Partie 4: Protecteurs pour laser**





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IEC 60825-4

Edition 3.0 2022-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Safety of laser products –
Part 4: Laser guards**

**Sécurité des appareils à laser –
Partie 4: Protecteurs pour laser**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF LASER PRODUCTS –

Part 4: Laser guards

FOREWORD

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IEC 60825-4 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 2006, Amendment 1:2008 and Amendment 2:2011. This edition constitutes a technical revision.

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

- a) Significant amendments have been included and this edition has been prepared for user convenience.

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

Draft	Report on voting
76/704/FDIS	76/711/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.

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INTRODUCTION

At low levels of irradiance or radiant exposure, the selection of material and thickness for shielding against laser radiation is determined primarily by a need to provide sufficient optical attenuation. However, at higher levels, an additional consideration is the ability of the laser radiation to remove guard material – typically by melting, oxidation or ablation; processes that could lead to laser radiation penetrating a normally opaque material.

IEC 60825-1 deals with basic issues concerning laser guards, including human access, interlocking and labelling, and gives general guidance on the design of protective housings and enclosures for high-power lasers.

Laser guards may also comply with standards for laser protective eyewear, but such compliance is not necessarily sufficient to satisfy the requirements of this document.

Where the term "irradiance" is used, the expression "irradiance or radiant exposure, as appropriate" is implied.

SAFETY OF LASER PRODUCTS –

Part 4: Laser guards

1 Scope

This part of IEC 60825 specifies the requirements for laser guards, permanent and temporary (for example for service), that enclose the process zone of a laser processing machine, and specifications for proprietary laser guards.

This document applies to all component parts of a guard including clear (visibly transmitting) screens and viewing windows, panels, laser curtains and walls.

In addition, this document indicates

- a) how to assess and specify the protective properties of a laser guard, and
- b) how to select a laser guard.

NOTE Requirements for beam path components, beam stops and those other parts of a protective housing of a laser product which do not enclose the process zone are contained in IEC 60825-1.

This document deals with protection against laser radiation only. Hazards from secondary radiation that may arise during material processing are not addressed.

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*

IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

ISO 11553-1, *Safety of machinery – Laser processing machines – Laser safety requirements*

ISO 12100, *Safety of machinery – General principles for design – Risk assessment and risk reduction*

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