SLOVENSKI STANDARD

SIST EN 60825-4:2008

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Nadomeġļ a:

SIST EN 60825-4:1999

SIST EN 60825-4:1999/A1:2003

SIST EN 60825-4:1999/A2:2004

Varnost laserskih izdelkov - 4. del: Zaġļ itna oprema za laserje (IEC 60825-4:2006)

Safety of laser products - Part 4: Laser guards (IEC 60825-4:2006)

Sicherheit von Lasereinrichtungen - Teil 4: Laserschutzwände (IEC 60825-4:2006)

Sécurité des appareils a laser - Partie 4: Protecteurs pour lasers (IEC 60825-4:2006)

Ta slovenski standard je istoveten z: EN 60825-4:2006

ICS:

31.260	Optoelektronika, laserska oprema	Optoelectronics. Laser equipment

SIST EN 60825-4:2008 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60825-4

October 2006

ICS 31.260

Supersedes EN 60825-4:1997 + A1:2002 + A2:2003

English version

Safety of laser products
Part 4: Laser guards
(IEC 60825-4:2006)

Sécurité des appareils à laser
Partie 4: Protecteurs pour lasers
(CEI 60825-4:2006)

Sicherheit von Lasereinrichtungen
Teil 4: Laserschutzwände
(IEC 60825-4:2006)

This European Standard was approved by CENELEC on 2006-10-01. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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

Ref. No. EN 60825-4:2006 E

Foreword

The text of document 76/342/FDIS, future edition 2 of IEC 60825-4, prepared by IEC TC 76, Optical radiation safety and laser equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60825-4 on 2006-10-01.

This European Standard supersedes EN 60825-4:1997 + A1:2002 + A2:2003.

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)	2007-07-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2009-10-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60825-4:2006 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 standards indicated:

IEC 60204-1	NOTE	Harmonized as EN 60204-1:2006 (modified).
IEC 61310-3	NOTE	Harmonized as EN 61310-3:1999 (not modified).
IEC 61496-2	NOTE	Harmonized as CLC/TS 61496-2:2006 (not modified).
IEC/TS 62046	NOTE	Harmonized as CLC/TS 62046:2005 (not modified).
ISO 10218	NOTE	Harmonized as EN 775:1992 (modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 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 60825-1	1993	Safety of laser products Part 1: Equipment classification,	EN 60825-1 + corr. February	1994 1995
A1	1997	requirements and user's guide	A1	2002
A2	2001		A2	2001
			+ corr. April	2004
ISO 11553-1	2005	Safety of machinery - Laser processing machines Part 1: General safety requirements	EN ISO 11553-1	2005
ISO 12100-1	2003	Safety of machinery - Basic concepts, general principles for design Part 1: Basic terminology, methodology	EN ISO 12100-1	2003
ISO 12100-2	2003	Safety of machinery - Basic concepts, general principles for design Part 2: Technical principles	EN ISO 12100-2	2003

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
60825-4

Deuxième édition
Second edition
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Sécurité des appareils à laser –

Partie 4:
Protecteurs pour lasers

Safety of laser products –

Part 4:
Laser guards

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Международная Электротехническая Комиссия

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For price, see current catalogue

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF LASER PRODUCTS –

Part 4: Laser guards

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 60825-4 has been prepared by IEC technical committee 76: Optical radiation safety and laser equipment.

This second edition of IEC 60825-4 cancels and replaces the first edition published in 1997, its amendment 1 (2002) and its amendment 2 (2003).

The document 76/342/FDIS, circulated to the National Committees as amendment 3, led to the publication of the new edition.

The text of this standard is based on the first edition, its amendment 1, amendment 2 and the following documents:

FDIS	Report on voting
76/342/FDIS	76/351/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 2.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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.

This part of IEC 60825 deals with protection against laser radiation only. Hazards from secondary radiation that may arise during material processing are not addressed.

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

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

In addition this part of IEC 60825 indicates:

a) how to assess and specify the protective properties of a laser guard; and

b) how to select a laser guard.

2 Normative references

The following referenced documents are indispensable for the application 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 60825-1:1993, *Safety of laser products – Part 1: Equipment classification, requirements and user's guide* [1)]

Amendment 1 (1997)

Amendment 2 (2001)

ISO 12100-1:2003, *Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology*

ISO 12100-2:2003, *Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles and specifications*

ISO 11553-1:2005, *Safety of machinery – Laser processing machines – Safety requirements*

3 Definitions

For the purpose of this part of IEC 60825, the following definitions apply in addition to the definitions given in IEC 60825-1.

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1) A consolidated edition (1.2) exists, including IEC 60825-1:2001 and its Amendments 1 (1997) and 2 (2001).

3.1
active guard protection time
for a given laser exposure of the front surface of an active laser guard, the minimum time, measured from the issue of an active guard termination signal, for which the active laser guard can safely prevent laser radiation accessible at its rear surface from exceeding the class 1 AEL

3.2
active guard termination signal
the signal issued by an active guard in response to an excess exposure of its front surface to laser radiation and which is intended to lead to automatic termination of the laser radiation

NOTE The action of a safety interlock becoming open circuit is considered a "signal" in this context.

3.3
active laser guard
a laser guard which is part of a safety-related control system. The control system generates an active guard termination signal in response to the effect of laser radiation on the front surface of the laser guard

3.4
foreseeable exposure limit
FEL
the maximum laser exposure on the front surface of the laser guard, within the maintenance inspection interval, assessed under normal and reasonably foreseeable fault conditions

3.5
front surface
the face of the laser guard intended for exposure to laser radiation

3.6
laser guard
a physical barrier which limits the extent of a danger zone by preventing laser radiation accessible at its rear surface from exceeding the class 1 AEL

3.7
laser processing machine
a machine which uses a laser to process materials and is within the scope of ISO 11553-1

3.8
laser termination time
the maximum time taken, from generation of an active guard termination signal, for the laser radiation to be terminated

NOTE Laser termination time does not refer to the response of an active laser guard but to the response of the laser processing machine, in particular the laser safety shutter.

3.9
maintenance inspection interval
the time between successive safety maintenance inspections of a laser guard

3.10
passive laser guard
a laser guard which relies for its operation on its physical properties only