

SLOVENSKI STANDARD SIST EN 60825-4:2008 01-januar-2008

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

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

(standards.iteh.ai)

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

SIST EN 60825-4:2008

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Ta slovenski standard je istoveten z:b54f/siEN 60825-412006

<u>ICS:</u>

31.260 Optoelektronika, laserska oprema

Optoelectronics. Laser equipment

SIST EN 60825-4:2008

en,fr,de

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SIST EN 60825-4:2008 https://standards.iteh.ai/catalog/standards/sist/9a594fa4-2e0d-4c7f-9654-1a79515cb54f/sist-en-60825-4-2008

EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

EN 60825-4

October 2006

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

ICS 31.260

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.

SIST EN 60825-4:2008

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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 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	https://standar	SIST EN 60825-4:2008 Harmonized as EN 61310-3:1999 (not modified) ds.itch.avcatalog/standards/sist/9a594ta4-2c0d-4c7f-9654-
IEC 61496-2	NOTE	1a79515cb54f/sist-en-60825-4-2008 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	<u>Year</u>	Title	<u>EN/HD</u>	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 + corr. April	2001 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 ₀₀₈ Part 2: Technical principles	EN ISO 12100-2	2003
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NORME INTERNATIONALE INTERNATIONAL STANDARD

CEI **IEC** 60825-4

Deuxième édition Second edition 2006-08

Sécurité des appareils à laser –

Partie 4: Protecteurs pour lasers

iTeh STANDARD PREVIEW Safety of laser products – (standards.iteh.ai)

Part 4: Laser guards<u>N 60825-4:2008</u> https://standards.iteh.ai/catalog/standards/sist/9a594fa4-2e0d-4c7f-9654-1a79515cb54f/sist-en-60825-4-2008

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CONTENTS

FOI	REWO	DRD	9
INT	RODI	JCTION	13
1	Scop	e	15
2	Norm	native references	15
3	Definitions		
4	Laser processing machines		19
	4.1	Design requirements	19
	4.2	Performance requirements	21
	4.3	Validation	21
	4.4	User information	23
5	Prop	rietary laser guards	23
	5.1	Design requirements	23
	5.2	Performance requirements	23
	5.3	Specification requirements	23
	5.4	Test requirements	25
	5.5 5.6	Labelling requirements.	25
	5.0		
۸nr		(informative) General guidance on the design and selection of laser guards	20
<u>л</u> ш Арг		(informative) General guidance on the design and selection of laser guards	29
Ann		(informative) Assessment of to escentie exposure limit (FEL)	33
Ann		(informative) Elaboration of defined terms 1a79515cb54//sist-en-60825-4-2008	47
Anr		(normative) Proprietary laser guard testing	51
Anr		(informative) Guidelines on the arrangement and installation of laser guards	55
Anr	iex F	(informative) Guideline for assessing the suitability of laser guards	75
Bib	iogra	phy	133
Fig	ure B.	1 – Calculation of diffuse reflections	35
Fig	ure B.	2 – Calculation of specular reflections	35
Fig	ure B.	3 – Some examples of a foreseeable fault condition	37
Fig	ure B. temp	4 – Four examples of errant laser beams that might have to be contained by a orary quard under service conditions	39
Fig	ire R	5 - Illustration of laser quard exposure during repetitive machine operation	00
Fig	iro B	6 - Two examples of assessed duration of exposure	
Ein	ле D. 1ro D	7 Assessed duration of exposure for a machine with no sofety monitoring	4J 15
Eir		 Assessed duration of exposure for a machine with no safety monitoring	40
Figi		 I – mustration of guarding around a laser processing machine Illustration of estive loser quark persentation. 	47
rigi		 2 – inustration of active laser guard parameters	49
Figi	ure D.	1 – Simplified diagram of the test arrangement	53

Figure F.1 – Damage resistance of 1 mm thick zinc coated steel sheet derived from 10 s exposure to a defocused beam during experiments using a CW CO ₂ laser111
Figure F.2 – Damage resistance of 1 mm thick zinc coated steel sheet derived from 100 s exposure to a defocused beam during experiments using a CW CO ₂ laser
Figure F.3 – Damage resistance of 2 mm thick zinc coated steel sheet derived from 10 s exposure to a defocused beam during experiments using a CW CO ₂ laser113
Figure F.4 – Damage resistance of 2 mm thick zinc coated steel sheet derived from 100 s exposure to a defocused beam during experiments using a CW CO ₂ laser
Figure F.5 – Damage resistance of 3 mm thick zinc coated steel sheet derived from 10 s exposure to a defocused beam during experiments using a CW CO ₂ laser115
Figure F.6 – Damage resistance of 3 mm thick zinc coated steel sheet derived from 100 s exposure to a defocused beam during experiments using a CW CO ₂ laser
Figure F.7 – Damage resistance of 2 mm thick aluminium sheet derived from 10 s exposure to a defocused beam during experiments using a CW CO ₂ laser
Figure F.8 – Damage resistance of 2 mm thick aluminium sheet derived from 100 s exposure to a defocused beam during experiments using a CW CO ₂ laser
Figure F.9 – Damage resistance of 1 mm thick stainless steel sheet derived from 10 s exposure to a defocused beam during experiments using a CW CO ₂ laser
Figure F.10 – Damage resistance of 1 mm thick stainless steel sheet derived from 100 s exposure to a defocused beam during experiments using a CW CO ₂ laser
Figure F.11 – Damage resistance of 6 mm thick polycarbonate sheet derived from 10 s exposure to a defocused beam during experiments using a CW CO ₂ /laser
Figure F.12 – Damage resistance of 6 mm thick polycarbonate sheet derived from 100 s exposure to a defocused beam during experiments using a CW CO ₂ laser
Figure F.13 – Damage resistance of 1 mm thick zinc coated steel sheet derived from 10 s exposure to a defocused beam during experiments using a CW Nd:YAG laser 123
Figure F.14 – Damage resistance of 1 mm thick zinc coated steel sheet derived from 100 s exposure to a defocused beam during experiments using a CW Nd:YAG laser123
Figure F.15 – Damage resistance of 2 mm thick zinc coated steel sheet derived from 10 s exposure to a defocused beam during experiments using a CW Nd:YAG laser 125
Figure F.16 – Damage resistance of 2 mm thick zinc coated steel sheet derived from 100 s exposure to a defocused beam during experiments using a CW Nd:YAG laser125
Figure F.17 – Damage resistance of 3 mm thick zinc coated steel sheet derived from 10 s exposure to a defocused beam during experiments using a CW Nd:YAG laser 127

Figure F.18 – Damage resistance of 3 mm thick zinc coated steel sheet derived from 100 s exposure to a defocused beam during experiments using a CW Nd:YAG laser 1	27
Figure F.19 – Damage resistance of 2 mm thick aluminium sheet derived from 10 s exposure to a defocused beam during experiments using a CW Nd:YAG laser	29
Figure F.20 – Damage resistance of 2 mm thick aluminium sheet derived from 100 s exposure to a defocused beam during experiments using a CW Nd:YAG laser	29
Figure F.21 – Damage resistance of 1 mm thick stainless steel sheet derived from 10 s exposure to a defocused beam during experiments using a CW Nd:YAG laser	31
Figure F.22 – Damage resistance of 1 mm thick stainless steel sheet derived from 100 s exposure to a defocused beam during experiments using a CW Nd:YAG laser 1	31
Table D.1 – Laser guard classification	.53
Table F.1 – Application of ALARP	81

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SIST EN 60825-4:2008 https://standards.iteh.ai/catalog/standards/sist/9a594fa4-2e0d-4c7f-9654-1a79515cb54f/sist-en-60825-4-2008

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF LASER PRODUCTS -

Part 4: Laser guards

FOREWORD

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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.

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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.

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.

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SAFETY OF LASER PRODUCTS -

Part 4: Laser guards

1 Scope

2

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.

Normative references STANDARD PREVIEW

(standards.iteh.ai) 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 quide 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

Definitions 3

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

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 quard

3.4

foreseeable exposure limit

FEL

3.5

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

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front surface

the face of the laser guard intended for exposure to laser radiation

3.6

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a physical barrier which limits the sextent 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