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Laser – Säkerhet – Del 1: Klassificering av utrustning samt fordringar

*Safety of laser products –
Part 1: Equipment classification and requirements*

Som svensk standard gäller europastandarden EN 60825-1:2007. Den svenska standarden innehåller den officiella engelska språkversionen av EN 60825-1:2007.

Nationellt förord

Europastandarden EN 60825-1:2007

består av:

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- **IEC 60825-1, Second edition, 2007 - Safety of laser products -
Part 1: Equipment classification and requirements**

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I en nationell bilaga NA (normativ) sist i standarden ges svenska översättningar av varningstexterna i avsnitt 5 i standarden.

Tidigare fastställd svensk standard SS-EN 60825-1, utgåva 3, 2003, gäller ej fr o m 2010-09-01.

ICS 31.110; 31.260

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Postadress: SEK, Box 1284, 164 29 KISTA
Telefon: 08 - 444 14 00. Telefax: 08 - 444 14 30
E-post: sek@elstandard.se. Internet: www.elstandard.se

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SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

English version

**Safety of laser products -
Part 1: Equipment classification and requirements
(IEC 60825-1:2007)**

Sécurité des appareils à laser -
Partie 1: Classification des matériels
et exigences
(CEI 60825-1:2007)

Sicherheit von Lasereinrichtungen -
Teil 1: Klassifizierung von Anlagen
und Anforderungen
(IEC 60825-1:2007)

This European Standard was approved by CENELEC on 2007-09-01. 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, Bulgaria, 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

Foreword

The text of document 76/338/CDV, future edition 2 of IEC 60825-1, prepared by IEC TC 76, Optical radiation safety and laser equipment, was submitted to the IEC-CENELEC parallel Unique Acceptance Procedure and was approved by CENELEC as EN 60825-1 on 2007-09-01.

This European Standard partially supersedes EN 60825-1:1994 (+ corrigendum February 1995) + A1:2002 + A2:2001 (+ corrigendum April 2004).

The user's guide has been removed from this part of the EN 60825 series and is now a separate document (Part 14). Light emitting diodes (LEDs) have been removed from the scope of this part of EN 60825, but may still be included in other parts.

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) 2008-06-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2010-09-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60825-1:2007 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 60027-1	NOTE	Harmonized as EN 60027-1:2006 (not modified).
IEC 60065	NOTE	Harmonized as EN 60065:2002 (modified).
IEC 60079	NOTE	Harmonized in EN 60079 series (partially modified).
IEC 60079-0	NOTE	Harmonized as EN 60079-0:2004 (not modified).
IEC 60204-1	NOTE	Harmonized as EN 60204-1:2006 (modified).
IEC 60825-2	NOTE	Harmonized as EN 60825-2:2004 (not modified).
IEC 60825-4	NOTE	Harmonized as EN 60825-4:2006 (not modified).
IEC 60825-12	NOTE	Harmonized as EN 60825-12:2004 (not modified).
IEC 60950	NOTE	Harmonized in EN 60950 series (modified).
IEC 61040	NOTE	Harmonized as EN 61040:1992 (not modified).
IEC 61508	NOTE	Harmonized in EN 61508 series (not modified).
IEC 62115	NOTE	Harmonized as EN 62115:2005 (modified).
ISO 11146-1	NOTE	Harmonized as EN ISO 11146-1:2005 (not modified).
ISO 11553-1	NOTE	Harmonized as EN ISO 11553-1:2005 (not modified).
ISO 12100-1	NOTE	Harmonized as EN ISO 12100-1:2003 (not modified).
ISO 12100-2	NOTE	Harmonized as EN ISO 12100-2:2003 (not modified).
ISO 13694	NOTE	Harmonized as EN ISO 13694:2000 (not 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-845	1987	International Electrotechnical Vocabulary (IEV) - Chapter 845: Lighting	–	–
IEC 60601-2-22	– ¹⁾	Medical electrical equipment - Part 2: Particular requirements for the safety of diagnostic and therapeutic laser equipment	EN 60601-2-22	1996 ²⁾
IEC 61010-1	– ¹⁾	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements	EN 61010-1 + corr. June	2001 ³⁾ 2002

1) Undated reference.

2) Valid edition at date of issue. EN 60601-2-22:1996 will be superseded by EN 60601-2-22:200X, which is based on IEC 60601-2-22:2007.

3) Valid edition at date of issue.

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SAFETY OF LASER PRODUCTS –

Part 1: Equipment classification and requirements

1 Scope and object

IEC 60825-1 is applicable to safety of laser products emitting laser radiation in the wavelength range 180 nm to 1 mm.

A laser product may consist of a single laser with or without a separate power supply or may incorporate one or more lasers in a complex optical, electrical, or mechanical system. Typically, laser products are used for demonstration of physical and optical phenomena, materials processing, data reading and storage, transmission and display of information, etc. Such systems have found use in industry, business, entertainment, research, education, medicine and consumer products.

Laser products that are sold to other manufacturers for use as components of any system for subsequent sale are not subject to IEC 60825-1, since the final product will itself be subject to this standard. However, if the laser system within the laser product is operable when removed from the equipment, the requirements of this Part 1 apply to the removable unit.

NOTE 1 Operable equipment does not require a tool to prepare for operation.

Any laser product is exempt from all further requirements of this Part 1 if classification by the manufacturer of that product according to Clauses 3, 8 and 9 shows that the emission level does not exceed the AEL (accessible emission limit) of Class 1 under all conditions of operation, maintenance, service and failure.

NOTE 2 The above exemption is to ensure that inherently safe laser products are not unnecessarily subject to the standard.

In addition to the hazards resulting from laser radiation, laser equipment may also give rise to other hazards such as fire and electric shock.

NOTE 3 However, the classification and other requirements of this standard are intended to address only the laser radiation hazards to the eyes and skin. Other hazards are not included within its scope.

This Part 1 describes the minimum requirements. Compliance with this Part 1 may not be sufficient to achieve the required level of product safety. Laser products must conform to the applicable performance and testing requirements of the applicable product safety standards.

NOTE 4 Other standards may contain additional requirements. Consideration should also be given to the intended application and user group. For example, a class 3B or class 4 laser product may not be suitable for use as a consumer product.

Where a laser system forms a part of equipment which is subject to another IEC product safety standard (e.g. for medical equipment (IEC 60601-2-22), IT equipment (IEC 60950), audio and video equipment (IEC 60065), equipment for use in hazardous atmospheres (IEC 60079), or electric toys (IEC 62115)), this Part 1 will apply in accordance with the provisions of IEC Guide 104²⁾ for hazards resulting from laser radiation. If no product safety standard is applicable, then IEC 61010-1 applies.

In previous editions, LEDs were included in the scope of IEC 60825-1, and they may be still included in other parts of the IEC 60825 series. However, with the development of lamp safety standards, optical radiation safety of LEDs in general can be more appropriately addressed by lamp safety standards. The removal of LEDs from the scope of this Part 1 does not preclude other standards from including LEDs whenever they refer to lasers. CIE S009 may be applied to determine the risk group class of an LED or product incorporating one or more LEDs.

The MPE (maximum permissible exposure) values of this Part 1 were developed for laser radiation and do not apply to collateral radiation. However, if a concern exists that accessible collateral radiation might be hazardous, the laser MPE values may be applied to conservatively evaluate this potential hazard.

The MPE values are not applicable to intentional human exposure to laser radiation for the purpose of medical or cosmetic/aesthetic treatment.

NOTE 5 Annexes A to H have been included for purposes of general guidance and to illustrate many typical cases. However, the annexes are not regarded as definitive or exhaustive and reference should always be made to the appropriate clause(s) in the normative part of this document.

The objectives of this part of IEC 60825 are the following:

- to introduce a system of classification of lasers and laser products according to their degree of optical radiation hazard in order to aid hazard evaluation and to aid the determination of user control measures;
- to establish requirements for the manufacturer to supply information so that proper precautions can be adopted;
- to ensure, through labels and instructions, adequate warning to individuals of hazards associated with accessible radiation from laser products;
- to reduce the possibility of injury by minimizing unnecessary accessible radiation and to give improved control of the laser radiation hazards through protective features.

²⁾ IEC Guide 104:1997, *The preparation of safety publications and the use of basic safety publications and group safety publications*