Australian/New Zealand Standard™

Safety of laser products

Part 1: Equipment classification, requirements and user's guide (IEC 60825-1:2001, MOD)

STANDARDS AUSTRALIA

STANDARDS NEW ZEALAND
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This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee SF-019, Personal Protection Against Laser Radiation. It was approved on behalf of the Council of Standards Australia on 11 February 2004 and on behalf of the Council of Standards New Zealand on 16 February 2004. It was published on 31 March 2004.

The following are represented on Committee SF-019:

Australasian Faculty of Occupational Medicine
Australian Chamber of Commerce and Industry
Australian Defence Force Academy
Australian Dental Association
Australian Radiation Laboratory
Department of Defence (Australia)
National Radiation Laboratory New Zealand
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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia International or Standards New Zealand at the address shown on the back cover.

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee SF-019, Personal Protection Against Laser Radiation. It is an adoption with national modifications, and has been reproduced from IEC 60825-1:2001, *Safety of laser products*, Part 1: *Equipment classification, requirements and user's guide*.

The 2001 edition of IEC 60825-1 was issued to incorporate IEC Amendment 1:1997 and IEC Amendment 2:2001 into IEC 60825-1:1993. The amended text is indicated by marginal bars. IEC Corrigendum to Amendment 2:2001 was issued in 2002. The correction to Table H1 contained in the corrigendum has been included in the Australian/New Zealand variations in Appendix ZZ.

For the purpose of this Standard, the IEC text is supplemented as set out in Appendix ZZ. These changes are indicated by a double marginal bar against the relevant clause or part thereof affected.

The objective of this Standard is to—

(a) protect people from laser radiation in the wavelength range 180 nm to 1 mm by indicating safe working levels of laser radiation and by introducing a system of classification of lasers and laser products according to their degree of hazard;

(b) lay down requirements for both user and manufacturer to establish procedures and supply information so that proper precautions can be adopted;

(c) ensure adequate warnings are provided to individuals of hazards associated with accessible radiation from laser products through the use of signs, labels and instructions;

(d) reduce the possibility of injury by minimizing unnecessary accessible radiation and to give improved control of the laser radiation hazards through protective features and provide safe usage of laser products by specifying user control measures; and

(e) protect people against other hazards resulting from the operation and use of laser products.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex to which they apply. A 'normative' annex is an integral part of a Standard, whereas an 'informative' annex is only for information and guidance.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text, 'IEC 60825-1' and 'this part 1' should read 'this Australian/New Zealand Standard'.

(c) A full point should be substituted for a comma when referring to a decimal marker.

References to International Standards should be replaced by references Australian Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*
IEC		AS/NZS
60027	Letter symbols to be used in electrical technology	—
60027-1	Part 1: General	—
60050	International Electrotechnical Vocabulary (IEV)	—
60050 (845)	Chapter: 845: Lighting	—

IEC		AS/NZS	
60601	Medical electrical equipment	3200	Medical electrical equipment
60601-2-22	Part 2-22: Particular requirements for the safety of diagnostic and therapeutic laser equipment	3200.2.22	Part 2.22: Particular requirements for safety—Diagnostic and therapeutic laser equipment
60825	Safety of laser products	2211	Safety of laser products
60825-2	Part 2: Safety of optical fibre communication systems (OFCS)	2211.2	Part 2: Safety of optical fibre communication systems (OFCS)
61010	Safety requirements for electrical equipment measurement, control and laboratory use		
61010-1	Part 1: General requirements	—	
61040	Power and energy measuring detectors, instruments and equipment for laser radiation	—	
ISO		AS ISO	
1000	SI units and recommendations for the use of their multiples and of certain other units	1000	The international system of units (SI) and its application

CONTENTS

SECTION ONE – GENERAL

SECTION TWO – MANUFACTURING REQUIREMENTS

SECTION THREE – USER'S GUIDE

NOTES

AUSTRALIAN/NEW ZEALAND STANDARD

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Part 1:
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(IEC 60825-1:2001, MOD)

Section One – General

1 Scope and object

1.1 Scope

IEC 60825-1 is applicable to safety of laser products. For convenience it is divided into three separate sections: Section One (General) and the annexes; Section Two (Manufacturing requirements); and Section Three (User's guide*).

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 and medicine. However, laser products which 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.

Throughout this part 1 light emitting diodes (LED) are included whenever the word "laser" is used. See also annex G which describes information which should be provided by manufacturers of LEDs.

Any laser product or LED product is exempt from all further requirements of this part 1 if

– classification by the manufacturer according to clauses 3, 8 and 9 shows that the emission level does not exceed the AEL of Class 1 under all conditions of operation, maintenance, service and failure, and

– it does not contain an embedded laser or embedded LED.

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

This part 1 describes the minimum requirements.

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), this part 1 will apply in accordance with the provisions of IEC Guide 104**, for hazards resulting from laser radiation.

However, if the laser system is operable when removed from the equipment, all the requirements of this part 1 will apply to the removed unit.

If no product safety standard is applicable, then IEC 61010-1 shall apply.

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* Some countries have requirements which differ from Section Three of this part 1. Therefore, contact the appropriate national agency for these requirements.

** IEC Guide 104:1984, *Guide to the drafting of safety standards, and the role of Committees with safety pilot functions and safety group functions.*

It gives guidance to IEC technical committees and to writers of specifications concerning the manner in which safety publications should be drafted.

This guide does not constitute a normative reference but reference to it is given for information only.