Australian/New Zealand Standard™

Safety of laser products

Part 10: Application guidelines and explanatory notes to AS/NZS 2211.1 (IEC TR 60825-10:2002, MOD)

STANDARDS AUSTRALIA

STANDARDS NEW ZEALAND
Paerewa Aotearoa

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 1 April 2004 and on behalf of the Council of Standards New Zealand on 16 April 2004. It was published on 3 June 2004.

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Australian Defence Force Academy
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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 to supersede AS/NZS 2211.1 Supp1:1999, *Laser safety,* Part 1: *Equipment classification, requirements and user's guide,* Supplement 1: *Application guidelines and explanatory notes*, *(Supplement to AS/NZS 2211.1:1977)*.

The Standard is an adoption with national modifications and has been reproduced from IEC TR 60825-10:2002, *Safety of laser products*, Part 10: *Application guidelines and explanatory notes to IEC 60825-1*.

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

The objective of this Standard is to provide users of AS/NZS 2211.1 with background information for that Standard (specifically the laser hazard, classification system, intrabeam viewing and extended source viewing), giving the user an insight into the physics behind the Standards, so that the user may correctly interpret its requirements.

The term 'normative' has been used in this Standard to define the application of the annex or appendix to which it applies. A 'normative' annex or appendix is an integral part of a Standard.

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, 'this technical report' 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	
60825	Safety of laser products	2211	Safety of laser products
60825-1	Part 1: Equipment classification, requirements and user's guide	2211.1	Part 1: Equipment classification, requirements and user's guide

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INTRODUCTION

This technical report is an informative document providing a simplified introduction to laser hazard concepts, classification, intrabeam viewing and extended source viewing used in IEC 60825-1, *Safety of laser products – Part 1: Equipment classification, requirements and user's guide*.

This technical report does not replace IEC 60825-1; however, if there is any real or apparent conflict between this technical report and the standard, the standard must prevail.

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1 Scope

This technical report gives information on the physics relating to the dangers posed by laser products. It complements, but does not replace, the information in IEC 60825-1 by explaining the underlying principles. The application of this technical report is limited to laser products with finite accessible emissions of laser radiation.

2 Object

This technical report provides a user of IEC 60825-1 with background information for that standard (specifically the laser hazard, classification system, intrabeam viewing and extended source viewing), giving the user an insight into the physics behind that standard, so that the user may correctly interpret its requirements.

3 Reference documents

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 – Equipment classification, requirements and user's guide* [1]
Amendment 1 (1997)
Amendment 2 (2001)

4 Definitions

For the purpose of this technical report, the definitions in IEC 60825-1 apply.

5 Why laser radiation is hazardous

Electromagnetic radiation is not normally considered dangerous. However, the simple analysis below shows that a 1 W laser can introduce more than five orders of magnitude greater light into the eye (at 1 m distance) than an incandescent bulb of equal power placed at the same distance, and more than one order of magnitude greater than that of the sun.

Laser radiation in the optical hazard region from 400 nm to 1 400 nm is focused to a small spot on the retina. This increases the hazard in that region. The current example illustrates the effect in the optical hazard region.

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[1] There exists a consolidated edition (2001) that includes IEC 60825-1 (1993) and its Amendment 1 (1997) and Amendment 2 (2001).