

# Australian/New Zealand Standard™

## Safety of laser products

### Part 3: Guidance for laser displays and shows



## **AS/NZS IEC 60825.3:2016**

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 23 August 2016 and by the New Zealand Standards Approval Board on 17 August 2016. This Standard was published on 12 September 2016.

---

The following are represented on Committee SF-019:

Australian Dental Association  
Australian Radiation Protection and Nuclear Safety Agency  
Defence Materiel Organisation (Australian Government)  
Department of Defence (Australian Government)  
Electronics Industry Association  
Institute of Environmental Science and Research  
NSW Business Chamber  
Telecom New Zealand

Additional Interests:

Telstra

---

### **Keeping Standards up-to-date**

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at [www.saiglobal.com](http://www.saiglobal.com) or Standards New Zealand web site at [www.standards.govt.nz](http://www.standards.govt.nz) and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

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 Standards Australia or the New Zealand Standards Executive at the address shown on the back cover.

---

*This Standard was issued in draft form for comment as DR SA/SNZ TR IEC 60825.3:2016.*

---

# Australian/New Zealand Standard™

## Safety of laser products

### Part 3: Guidance for laser displays and shows

Originated as AS/NZS 2211.3:2002.  
Revised and redesignated as AS/NZS IEC 60825.3:2016.

#### **COPYRIGHT**

© Standards Australia Limited/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, PO Box 1473, Wellington 6011.

## 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 2211.3:2002.

The objective of this Standard is to give guidance on the planning and design, set-up and conduct of laser displays and shows that make use of high power lasers.

This Standard is identical with, and has been reproduced from IEC/TR 60825-3, Ed. 2.0:2008, *Safety of laser products, Part 3: Guidance for laser displays and shows*.

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

- (a) In the source text 'this part of IEC 60825' should read 'this Australian/New Zealand Standard'.
- (b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>	<i>Australian/New Zealand Standard</i>
IEC/TR	AS/NZS IEC
60825 Safety of laser products	60825 Safety of laser products
60825-14 Part 14: A user's guide	60825.14 Part 14: A user's guide

Only normative references that have been adopted as Australian or Australian/New Zealand Standards have been listed.

## CONTENTS

1	Scope and object.....	5
1.1	Scope.....	5
1.2	Object .....	5
2	Normative references .....	6
3	Terms and definitions .....	6
4	Zone limits and maximum permissible exposures (MPE) for laser radiation .....	8
4.1	Compliance with maximum permissible exposure (MPE) .....	8
4.2	Spectator MPE .....	8
4.3	Ancillary personnel MPE .....	9
4.4	Performer MPE.....	9
5	Safety criteria for equipment and installations .....	10
6	Responsibilities of designers, installers, operators and performers.....	13
6.1	Training.....	13
6.2	Planning by designers, installers and operators.....	13
6.3	Set-up and alignment .....	13
6.4	Operation .....	14
6.5	Display safety record (DSR) .....	14
7	Special considerations.....	15
7.1	Holographic displays .....	15
7.2	Ultraviolet and blue-light laser beams.....	15
	Bibliography.....	16
	Figure 1 – Time for a scanning safeguard to be effective .....	9
	Figure 2 – Spectator separation with operator in control .....	11
	Figure 3 – Audience/spectator separation with operator in control.....	12
	Figure 4 – Audience/spectator separation from unattended beams .....	12
	Table 1 – Summary of MPE selection criteria .....	10

NOTES

## AUSTRALIAN/NEW ZEALAND STANDARD

**Safety of laser products****Part 3:  
Guidance for laser displays and shows****1 Scope and object****1.1 Scope**

This part of IEC 60825, which is a technical report, gives guidance on the planning and design, set-up and conduct of laser displays and shows that make use of high power lasers. The laser power needed to produce effective theatrical or artistic displays in large spaces such as theatres, arenas, or architectural sites is great enough to pose a severe accidental exposure hazard, even when personal exposure is very brief. For this reason, subclause 4.1.5 of IEC/TR 60825-14 specifies that only laser products that are Class 1, Class 2 or visible-beam Class 3R should be used for demonstration, display or entertainment purposes in unsupervised areas. Laser products of other classes should only be permitted under carefully controlled conditions and under the control of a trained experienced operator.

The guidance provided in this technical report is not intended to include the display or demonstration of scientific, medical or industrial laser products. However, many of the principles in this guidance may be relevant. This guidance provides recommendations for safety for those laser displays or demonstrations that are shows, artistic displays, advertising or light sculptures, or museum pieces used to demonstrate optical principles, etc.

Laser products available for use in a domestic environment or for use by people who cannot be expected to have received a suitable level of training should be Class 1, Class 2 or visible beam Class 3R. Therefore, such equipment is outside the scope of this guidance.

**1.2 Object**

This guidance is intended to be used by those who:

- design, manufacture, assemble, install or operate laser products that are Class 4, Class 3B, or non-visible beam Class 3R for display and entertainment purposes;
- operate arenas, theatres, planetaria, discotheques or other places where such laser products may be installed and operated; or
- are responsible for reviewing the safety of such equipment, installations or displays.

This guidance is not normative, but rather a code of practice for the design, installation, operation and evaluation of the safety of laser light shows and displays, and the equipment employed in their production. This guidance is also intended for persons who modify laser display installations or equipment.

This guidance contains safety criteria for the protection of the public or persons in the vicinity of laser displays in the course of their employment.

In some countries, there may be specific requirements, such as government permissions or notifications of shows, or prohibitions, such as against laser scanning of spectators without appropriate safeguards. This guidance is not to be understood as in conflict with such requirements but merely to be supplementary.