

Laser Safety in a Whole New Light

Rockwell Laser Industries

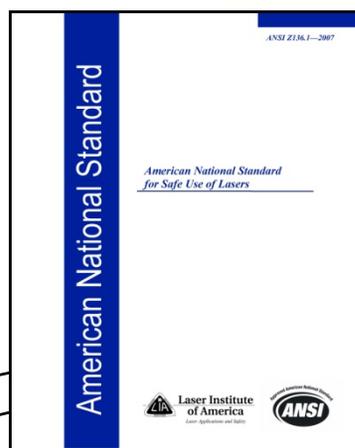


***ANSI Z136 Standards
Series Update
& Z136.1 Philosophy
for Next Revision***

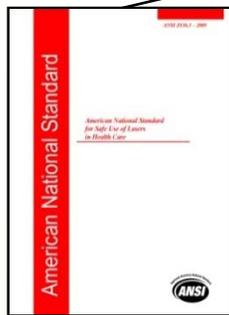


American National Standard Z136 Series

Z136.1 for Safe Use of Lasers



Horizontal Standard
Fundamental Information



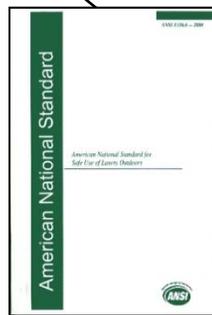
Z136.3



Z136.4



Z136.5



Z136.6



Z136.7



Z136.8



Z136.9

Vertical Standards - Specific Information
Various Applications

The Newest Member of the ANSI Z136 Series



ANSI Z136.9-2013
Safe Use of Lasers in
Manufacturing Environments

DRAFT Standard

Z136.10 for Safe Use of Lasers

**Entertainment, Displays &
Exhibitions**



ANSI Z136 Standards History and Status

ANSI Standard	Latest Publication Date	Previous Editions
Z136.1	2014	1973, 1976, 1980, 1986, 1993, 2000, 2007
Z136.2	2012	1977, 1988, 1997
Z136.3	2011	1988, 1996, 2005
Z136.4*	2010	2005
Z136.5	2009	2000
Z136.6	2005	2000
Z136.7	2008	
Z136.8	2012	
Z136.9	2013	
Z136.10	Draft	

Recent Changes in Z136.1

beginning of the shift to a horizontal standard for all Z136 vertical standards, where vertical standards have precedence within the scope of those standards

units changed to nanometers for all wavelengths shorter than 2,999 nm (180 nm to 2,999 nm) and microns for longer wavelengths (3 μm to 1,000 μm)

tables have been expanded for clarity and ease of use

includes Optics Transmission in Hazard Classification

Sections 4 (control measures) and 7 (non-beam hazards) and

Appendix B (Example Calculations) reorganized and

rewritten

Recent Changes in Z136.1

Some new maximum permissible exposure limits (MPEs)

Added 19 definitions, deleted 9 definitions.

- Added: administrative control measure; beam divergence; beam waist; conduit; control measure; engineering control measure; laser controlled area; crossover pulse-repetition frequency; hot spot; illuminance; laser target interaction radiation (LTIR); personal protective equipment (PPE); photopic luminous efficiency; procedural control measure; saturable absorption; t_{\min} ; troland; visible luminous transmission (VLT); and visual interference effects.

Plans for Next Revision of Z136.1

Overall philosophy

- Information must be broadly applicable to remain in or be added to the horizontal standard to include
 - Definitions
 - Examples
 - Control Measures
 - Training
 - Non-Beam Hazards
 - Measurements
- Anything that applies to a particular application or two should be included in that/those standards or recommended practices

Plans for Next Revision of Z136.1

It is anticipated that the horizontal standard will primarily consist of

- Broadly Applicable Definitions
- Hazard Evaluation and Classification
- MPEs
- Fundamental Control Measures
- Fundamental Education and Training Requirements
- General Medical Exam Requirements
- General Non-Beam Hazards
- Classification and Hazard Evaluation Examples

Effects of Next Revision on Z136 Series

Overall philosophy

- It is the hope of the Z136.1 Chairman that vertical standards will include information specific to their application, whilst leaving out general information
- Having very little repeated information in the parent standard and the vertical standards should result in
 - Less redundancy
 - Fewer conflicts
 - Avoids vertical standards becoming outdated by a revision of the parent standard and vice versa
- Possible drawback – Vertical standards will not be stand-alone documents

Effects of Next Revision on Z136 Series

It is anticipated that the vertical standards and recommended practices will primarily consist of **application specific**

- Definitions
- Control Measures
- Education and Training Requirements
- Non-Beam Hazards
- Classification and Hazard Evaluation Examples

Thank you

- We would like to acknowledge **Dr. Ben Rockwell**, previous chair of SSC-1, and **Barbara Sams**, Director of Standards Development for the LIA, for information used in this presentation

