American National Standard

ANSI Z136.8 – 2012

American National Standard for Safe Use of Lasers in Research, Development, or Testing

Laser Institute of America
Laser Applications and Safety

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1. General

1.1 Scope.

This standard provides recommendations for the safe use of lasers and laser systems that operate at wavelengths between 180 nm and 1000 μm and are used to conduct research or used in a research, development, or testing environment.

1.2 Application.

The objective of this standard is to provide reasonable and adequate guidance for the safe use of lasers and laser systems in research, development, and testing environments, where safety controls common for commercial lasers may be either missing (nonexistent) or disabled. Similarly, in testing environments, lasers or laser systems may be operated in conditions or protocols different from normal operation, including access to levels of radiation higher than the accessible emission limits (AEL) for the assigned product class.

Typically, this objective is accomplished by first classifying the laser and laser systems according to their relative hazards and then by specifying appropriate control measures based upon their relative hazards and conditions of use. In most cases, this procedure eliminates the need for laser radiation measurements, quantitative analysis of hazard potential, or the use of point or extended source maximum permissible exposure (MPE) values.

The ANSI Z136.1 standard supports this application-specific standard by providing the quantitative methods for hazard analysis and the MPE values for optical radiation exposure. Other application-specific standards within the ANSI Z136 series may deviate from the requirements of this standard. It is the responsibility of the Laser Safety Officer (LSO) to review and use the applicable standards in the series for their actual condition of use.

It may be necessary to utilize the requirements from several standards in the ANSI Z136 series to achieve proper hazard control for the intended condition of use in a research, development, or testing environment. For example, an outdoor laser research activity may require application of both the ANSI Z136.6 and Z136.8 standard control measures in order to mitigate potential hazards.[1]

The basis of the hazard classification scheme in Section 3 of this standard is the ability of the laser to cause biological damage to the eye or skin. Non-beam hazards, e.g., electrical hazards, must be controlled, but are not considered within the hazard classification scheme. Individuals shall refer to ANSI Z136.1 for the current hazard classifications, MPE values for ocular and skin exposure, as well as quantitative hazard analysis calculation methods. The

[1] When the year of publication is shown, the reference is to that specific standard; when the year of publication is not shown, it means the latest revision of that standard.