

American National Standard

*American National Standard
for Safe Use of Lasers
in Health Care*



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**American National Standard
for Safe Use of Lasers
in Health Care**

**Secretariat
Laser Institute of America**

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**American
National
Standard**

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Foreword (This introduction is not a normative part of ANSI Z136.3-2018, *American National Standard for Safe Use of Lasers in Health Care.*)

In 1968, the American National Standards Institute (ANSI) approved the initiation of the Safe Use of Lasers Standards Project under the sponsorship of the Telephone Group.

Prior to 1985, Z136 standards were developed by ANSI Committee Z136 and submitted for approval and issuance as ANSI Z136 standards. Since 1985, Z136 standards have been developed by the ANSI Accredited Standards Committee (ASC) Z136 for Safe Use of Lasers. A copy of the procedures for development of these standards can be obtained from the secretariat, Laser Institute of America, 13501 Ingenuity Drive, Suite 128, Orlando, FL 32826, or viewed at www.z136.org.

The present scope of ASC Z136 is to protect against hazards associated with the use of lasers and optically radiating diodes.

ASC Z136 is responsible for the development and maintenance of this standard. In addition to the consensus body, ASC Z136 is composed of standards subcommittees (SSC) and technical subcommittees (TSC) involved in Z136 standards development and an editorial working group (EWG). At the time of this printing, the following standards and technical subcommittees were active:

SSC-1	Safe Use of Lasers (parent document)
SSC-2	Safe Use of Lasers and LEDs in Telecommunications Applications
SSC-3	Safe Use of Lasers in Health Care
SSC-4	Measurements and Instrumentation
SSC-5	Safe Use of Lasers in Educational Institutions
SSC-6	Safe Use of Lasers Outdoors
SSC-7	Eyewear and Protective Barriers
SSC-8	Safe Use of Lasers in Research, Development, and Testing
SSC-9	Safe Use of Lasers in Manufacturing Environments
SSC-10	Safe Use of Lasers in Entertainment, Displays, and Exhibitions
TSC-1	Biological Effects and Medical Surveillance
TSC-2	Hazard Evaluation and Classification
TSC-4	Control Measures and Training
TSC-5	Non-Beam Hazards
TSC-7	Analysis and Applications
EWG	Editorial Working Group

The eight standards currently issued are:

ANSI Z136.1-2014, *American National Standard for Safe Use of Lasers*

ANSI Z136.2-2012, *American National Standard for Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources*

ANSI Z136.3-2018, *American National Standard for Safe Use of Lasers in Health Care*

ANSI Z136.4-2010, *American National Standard Recommended Practice for Laser Safety Measurements for Hazard Evaluation*

ANSI Z136.5-2009, *American National Standard for Safe Use of Lasers in Educational Institutions*

ANSI Z136.6-2015, *American National Standard for Safe Use of Lasers Outdoors*

ANSI Z136.8-2012, *American National Standard for Safe Use of Lasers in Research, Development, or Testing*

ANSI Z136.9-2013, *American National Standard for Safe Use of Lasers in Manufacturing Environments*

This American National Standard is intended to ensure the safe use of lasers in health care, and has been published as part of the ANSI-approved Z136 series of laser safety standards. The base document of the series is the *American National Standard for Safe Use of Lasers*, ANSI Z136.1. The procedures and methodologies described in this standard are based on requirements previously established in ANSI Z136.1 and are intended to give more specific processes for accomplishing laser safety in health care. The purpose of this standard is to provide user guidance for establishing, implementing, and monitoring a laser safety program. The standard provides relevant information on protecting staff, patients, and others who may be at risk for exposure to the hazards associated with the use of medical lasers, regardless of application, specialty use, or setting, including hospital facilities, individual medical, dental and veterinarian offices, and non-medical locations such as salons and spas.

In general, this standard may be used independently of ANSI Z136.1. Instances where additional guidance contained in ANSI Z136.1 is required are noted in the text of this document. The body of this standard is normative and applies to all health care laser use. The appendices are informative providing examples and discipline specific supplementary information.

It is expected that this standard will be periodically revised as new information and experience in the use of lasers are gained. Future revisions may have modified content and the use of the most current document is highly recommended.

While there is considerable compatibility among existing laser safety standards, some requirements differ among state, federal, and international standards and regulations. These differences may have an effect on the particulars of the applicable control measures.

Occasionally questions may arise regarding the meaning or intent of portions of this standard as it relates to specific applications. When the need for an interpretation is brought to the attention of the secretariat, the secretariat will initiate action to prepare an appropriate response. Since ANSI-approved Z136 standards represent a consensus of concerned interests, it is important to ensure that any interpretation has also received the concurrence of a balance of interests. For this reason, the secretariat is not able to provide an instant response to interpretation requests except in those cases where the matter has previously received formal consideration. Requests for interpretations and suggestions for improvements of the standard are welcome. They should be sent to ASC Z136 Secretariat, Laser Institute of America, 13501 Ingenuity Drive, Suite 128, Orlando, FL 32826.

This standard was developed by Standards Subcommittee 3 (SSC-3) “Safe Use of Lasers in Health Care” and approved by ANSI Accredited Standards Committee (ASC) Z136 for Safe Use of Lasers. Committee approval of the standard does not necessarily imply that all members voted for its approval.

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Notice

(This notice is not a normative part of ANSI Z136.3-2018, *American National Standard for Safe Use of Lasers in Health Care.*)

Z136 standards and recommended practices are developed through a consensus standards development process approved by the American National Standards Institute. The process brings together volunteers representing varied viewpoints and interests to achieve consensus on laser safety related issues. As secretariat to ASC Z136, the Laser Institute of America (LIA) administers the process and provides financial and clerical support to the committee.

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American National Standard for Safe Use of Lasers in Health Care

1. General

1.1 Scope.

This standard provides guidance for the safe use of lasers in health care. As defined herein, laser radiation refers to the ultraviolet, visible, and infrared regions of the electromagnetic spectrum. Laser radiation should not be confused with ionizing radiation or light from other sources.

Specific processes are provided to protect anyone who might become exposed to laser radiation and to assist in establishing a program that promotes the safe use of health care laser systems (HCLS). The following guidelines for laser safety programs contain requirements (designated by *shall*) and recommendations (designated by *should*). The scope of this standard includes all circumstances when people may be exposed to a laser used in health care applications where:

- a) Laser systems as medical devices are used for diagnosis of disease, or for preventive, aesthetic, or therapeutic purposes
- b) Bodily structure or function is altered, or symptoms are relieved
- c) Any application where a laser is applied for health or wellness purposes

This standard applies to any location where an HCLS is being used as a medical device, including hospital facilities, ambulatory surgery centers (ASC), individual medical, dental and veterinarian offices, and non-medical locations, such as salons and spas.

A laser used in these applications is incorporated into an entire apparatus, referred to as an HCLS, which includes:

- a) A delivery system to direct the output of the laser
- b) A power supply with laser control and calibration functions
- c) Protective housing, including mechanical housing with interlocks if required
- d) Associated liquids and gases if required for the operation of the laser

This standard pertains to the safe use of lasers and laser systems that operate at wavelengths between 180 nm and 1000 μm . It is intended for use by all people associated with the application, installation, operation, calibration, maintenance and service of an HCLS and anyone who might be exposed to lasers being used as medical devices for health care applications.

This standard provides guidance to employers for establishing proper laser safety policies and procedures and training programs in safe laser use.

This standard includes engineering, procedural and administrative controls, and laser safety training. These controls are based upon the following: evaluation of potential hazards from laser radiation, unique problems related to hospitals and operating rooms (ORs) and non-hospital