American National Standard

ANSI Z136.6—2005

American National Standard for Safe Use of Lasers Outdoors

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First Printing

American National Standard for Safe Use of Lasers Outdoors

Secretariat
Laser Institute of America

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American National Standards Institute, Inc.

American National Standard

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Foreword

(This introduction is not a normative part of ANSI Z136.6-2005, American National Standard for Safe Use of Lasers Outdoors.)

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 are developed by ANSI Accredited Standards Committee (ASC) Z136. A copy of the procedures for development of these standards can be obtained from the secretariat, the Laser Institute of America, 13501 Ingenuity Drive., Suite 128, Orlando, FL 32826 or viewed at www.z136.org.

The present scope of ASC Z136 covers protection 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. 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 Facilities
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

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 six standards currently issued are:

ANSI Z136.1-2000, American National Standard for Safe Use of Lasers (replaces ANSI Z136.1-1993)

ANSI Z136.2-1997, American National Standard for Safe Use of Optical Fiber Communication Systems Utilizing Laser Diode and LED Sources (replaces ANSI Z136.2-1989)

ANSI Z136.3-2005, American National Standard for Safe Use of Lasers in Health Care Facilities (replaces ANSI Z136.3-1996)

ANSI Z136.4-2005, American National Standard Recommended Practice for Laser Safety Measurements for Hazard Evaluation (first edition)

ANSI Z136.5-2000, American National Standard for Safe Use of Lasers in Educational Institutions (first edition)

ANSI Z136.6-2005, American National Standard for Safe Use of Lasers Outdoors (replaces ANSI Z136.6-2000)

This American National Standard provides guidance for the safe use of lasers and laser systems in an outdoor environment, including laser products that have been granted a variance or exemption from the provisions of the federal product performance standard (21 CFR 1040). Products and applications covered include laser light shows, lasers used for outdoor scientific research, and military lasers. In addition to injurious levels of optical radiation, which are covered in other ANSI Z136 standards, this standard covers possible indirect hazards such as visual interference at night to pilots during takeoff and landing.

Development of this standard has been a collaborative effort of members of the SAE G-10 Committee, laser light show industry, DoD, FDA/CDRH, FAA, NASA, laser and laser light show manufacturers, and laser users including scientists and astronomers. This document serves as a companion to the SAE Aerospace Standard AS4970, 21 CFR 1040, FAA Order 7400.2 and related FAA documents, Military Standard 1425, and Military Handbook 828, for determining the hazards from outdoor laser operations.

This standard provides acceptable levels of irradiation in particular defined zones of navigable airspace in order to minimize visual interference to air crews. These zones were created to reduce illumination levels of aircrews during critical phases of flight, primarily during takeoff and landing, in response to numerous incidents of aircraft illuminations that have occurred during the past several years. These defined levels of irradiation may also apply to operators of vehicles other than aircraft. As more powerful commercial off the shelf lasers have become available, the threat to aircraft and other vehicles from illumination by a laser has increased. For visible laser exposure, indirect hazards due to hampered vision have been demonstrated at levels below the levels that would cause permanent eye injury.

This standard has been published as part of the American National Standard Z136 series. The basic document is American National Standard for Safe Use of Lasers, Z136.1. In general, this standard may be used independently of ANSI Z136.1-2000. Instances where additional guidance contained in ANSI Z136.1-2000 is required are noted in this document.

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 use of the most current document is required. While there is considerable compatibility among existing laser safety standards, state, federal, and international requirements and standards may differ, particularly with respect to signs, symbols, and control measures.

Suggestions for improvements of the standard will be welcome. They should be sent to the ASC Z136 Secretariat, Laser Institute of America, 13501 Ingenuity Drive, Suite 128, Orlando, FL 32826.

This standard was developed by SSC-6 (Safe Use of Lasers Outdoors) and approved by ANSI Accredited Standards Committee Z136 on the Safe Use of Lasers. Committee approval of the standard does not necessarily imply that all members voted for its approval.

- Ron Petersen, Committee Chair
- Jerry Dennis, Committee Vice-Chair
- Sheldon Zimmerman, Committee Secretary

Notice

(This notice is not a normative part of ANSI Z136.6-2005, American National Standard for Safe Use of Lasers Outdoors.)

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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