SOUTHWEST MANUFACTURING TECHNOLOGY SERIES

GUIDELINES FOR SAFE LASER EXHIBITS

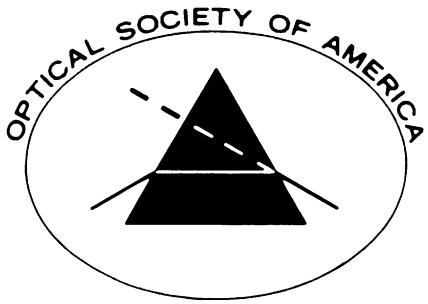
An effective exhibit requires careful advance planning and preparation. As part of that process, it is imperative that consideration be given to the safety of everyone in the exhibition area. Ensuring that an exhibit is a safe one is both a personal and a corporate responsibility.

This information is not intended to be all-encompassing, and it does not spell out laser safety standards. It is your responsibility to be aware of and to conform to all applicable safety regulations and standards.

The guidelines given here are intended to set the tone for the planning and conduct of your exhibit. Should you have any specific safety related questions, please direct them to the Exposition Operations Manager or contact the Laser Safety Standards Committee, Optical Society of America, 2010 Massachusetts Avenue NW, Washington, DC 20036-1012.

Based on observations of previous laser exhibits, the following guidelines illustrate methods for addressing several specific safety problems.

Information obtained from a printing by the Optical Society of America



All laser beams must terminate in a beam block that is firmly secured in place. A power meter that can be moved out of the way of the beam is not a beam block; a beam block should be provided beyond the power meter. The beam block must be substantial and suitable for the energy and wavelength involved. It must not produce specular reflections or excessively bright, diffusely scattered light.

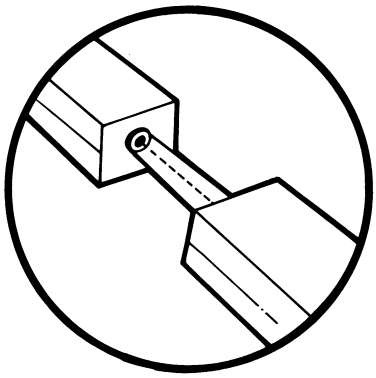
Exhibitors must be cognizant of the eye hazards that may occur during the often hectic setup phase of an exhibit. Precautions must be taken to protect other workers in the exhibit area as well as personnel in the booth itself. The use of temporary cardboard shields or curtains around the area is an effective way to prevent beams from wandering during the exhibit setup.

Exhibitors are encouraged to bring extra material for shielding laser beams, fastening components to benches, etc. so that unforeseen problems which inevitably crop up can easily be dealt with.

The eye hazards of some non-laser light sources, such as intense UV arc lamps, flashlamps, and intense dye fluorescence, should be recognized, and appropriate safety precautions should be employed.

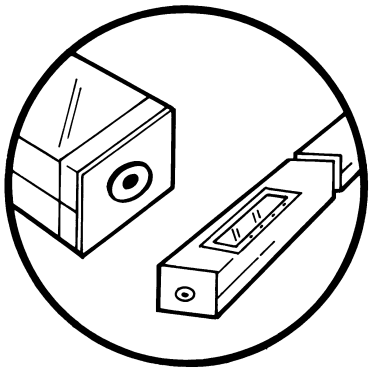
THE REVERSE SIDE OF THIS SHEET SHOWS ADDITIONAL SAFETY PRECAUTIONS THAT MAY BE USED.

Beam Enclosure



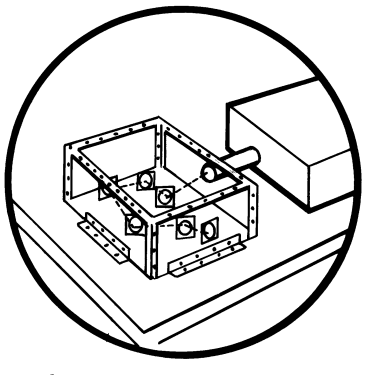
Any potentially dangerous laser beams must be enclosed or otherwise made inaccessible to visitors. The enclosures or guards must be sturdy enough and well enough secured to resist normal bumps and jostling and even casual, curious removal. An example, using simple materials, is shown here. A clear plastic tube encloses a laser beam as it passes from one device to another; the tube is firmly attached to each device.

Demonstrating Internal Laser Elements



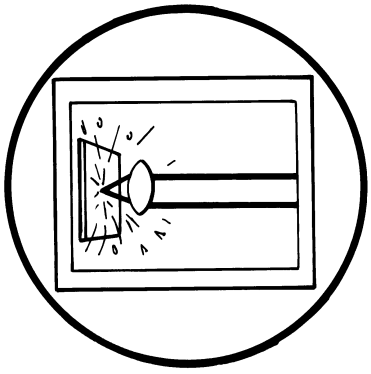
Visitors often want to view the interior of working lasers or similar devices. Removing the cover of a working laser should not be done since this can expose persons in the exhibit to thermal, electrical, and optical hazards. One effective solution that has been widely employed is the use of clear or smoked plastic covers in place of the usual opaque laser covers. Another approach uses similar plastic to cover openings cut in the standard laser cover. Remember that reflections from internal optical surfaces and radiation from bright sources that are usually blocked by the cover may emerge through the semitransparent plastic. Check for them carefully and provide internal beam blocks where required.

Demonstrating Laser Interaction Phenomena



A simple, but sturdy, plastic box can be used to enclose tabletop space in which multiple beams are involved in various interactions. Once again, carefully check to see that no stray beams leave the box; block them internally. This technique has the additional advantage of preventing curious visitors from readjusting the alignment.

Video Demonstration



Dramatic demonstrations for which adequate safety precautions would be difficult might effectively be demonstrated by using video tape. An example for which this approach seems particularly appropriate would be the demonstration of laser welding and cutting.