Lasers

Use of Laser Devices

Unless otherwise specified in the event rules, the following will apply:

Laser levels, pointers and other laser devices are intended to be operated under the control of a human operator at all times. The use of some types of laser devices is permitted provided proper safety precautions as outlined below are taken.

All lasers are required to have a safety label stating the class they fall under. Lasers missing the required label will not be permitted. Due to the difficulty of verifying power output, only commercially assembled laser devices may be used.

There are 2 systems of classification of Lasers: the 'old system', in use prior to 2002, and the 'revised system', being phased in since 2002.

Revised system classes:

Class 1: A class 1 laser is safe under all conditions of normal use. They are allowed provided contestants avoid indiscriminate exposure to other contestants, judges or spectators. Careless/indiscriminate use may be grounds for disqualification.

Class 1M: A class 1M laser is safe for all conditions of use except when passed through magnifying optics such as microscopes and telescopes. They are allowed provided contestants avoid indiscriminate exposure to other contestants, judges or spectators and do not utilize magnifying optics in the area of the laser. Careless/indiscriminate use may be grounds for disqualification.

Class 2: A class 2 laser is safe because the blink reflex will limit the exposure to no more than 0.25 seconds. This only applies to visible-light lasers (400–700 nm). They are allowed provided contestants avoid indiscriminate exposure to other contestants, judges or spectators. Careless/indiscriminate use may be grounds for disqualification.

Class 2M: A class 2M laser is safe because of the blink reflex if not viewed through optical instruments. This only applies to visible-light lasers (400–700 nm). They are allowed provided contestants avoid indiscriminate exposure to other contestants, judges or spectators and do not utilize magnifying optics in the area of the laser. Careless/indiscriminate use may be grounds for disqualification.

Class 3R: A class 3R laser has a risk of injury if viewed directly. They are NOT allowed to be utilized.

Class 3B: A class 3B laser has a risk of injury if viewed directly. They are NOT allowed to be utilized.

Class 4: A class 4 laser has a risk of injury if viewed directly. They are NOT allowed to be utilized.

"Old" system classes (note some labels may use Arabic instead of Roman numerals):

Class I: A class I laser is safe under all conditions of normal use. They are allowed provided contestants avoid indiscriminate exposure to other contestants, judges or spectators. Careless/indiscriminate use may be grounds for disqualification.

Class II: A class II laser is safe because the blink reflex will limit the exposure to no more than 0.25 seconds. This only applies to visible-light lasers (400–700 nm). They are allowed provided contestants avoid indiscriminate exposure to other contestants, judges or spectators. Careless/indiscriminate use may be grounds for disqualification.

Class IIa: A class IIa laser is safe because the blink reflex will limit the exposure to no more than 0.25 seconds. This only applies to visible-light lasers (400–700 nm). They are allowed provided contestants avoid indiscriminate exposure to other contestants, judges or spectators. Careless/indiscriminate use may be grounds for disqualification.

Class IIIa: A class IIIa laser has a risk of injury if viewed directly. They are NOT allowed to be utilized.

Class IIIb: A class IIIb laser has a risk of injury if viewed directly. They are NOT allowed to be utilized.

Class IV: A class IV laser has a risk of injury if viewed directly. They are NOT allowed to be utilized.

Note that most of Europe has now established that only Class 2 or less lasers are legal for sale as laser pointers and other publically available devices. In the US, some such devices are class IIIa, but out of an abundance of caution they are NOT allowed in Science Olympiad events.

Lasers must be operated using batteries and voltage as specified by the device's manufacturer. Modification of the laser's electronic control circuitry, other than switches used to turn the device on/off, is not allowed. Optical components, other than those installed by the manufacturer, used to collimate/concentrate the laser's beam may not be used.

The tournament officials and/or event supervisors at each tournament must inspect the device and its proposed usage to determine if it is safe. Their decision is final.

Other light sources, such as a high brightness LED mounted in a small tube to direct/limit the beam, can often be used in lieu of a laser to accomplish the task and thus eliminate any safety concerns.

References concerning laser safety:

U.S. Food and Drug Administration - Illuminating the Hazards of Powerful Laser Products

http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm166649.htm

Laser Institute of America - Laser Pointer Safety:

http://www.laserinstitute.org/subscriptions/safety_bulletin/laser_pointer

Health Physics Society - Laser Pointer Safety:

http://hps.org/hpspublications/articles/laser.html

From: World Health Organization - Health Risks From the Use of Laser Pointers:

http://www.who.int/uv/resources/fact/en/fs202laserpointers.pdf