

Use of Laser and High-Brightness LED Devices

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

Laser and high-brightness LED devices are intended to be operated under the control of a human operator at all times. Any usage of such devices must be controlled so that it is not directed toward the eyes of any tournament participant or spectator. Any operation of a device focused toward another person's head may be considered unsafe operation and result in disqualification.

Lasers and high-brightness LEDs must be operated using voltages as specified by the device's manufacturer. Modification of a device's electronic control circuitry is not allowed, other than the addition of team provided on/off switches and/or external power supplies providing the same voltage and current as the device's regular batteries. Optical components used to concentrate the emitted light may not be used, other than those installed by the manufacturer.

All devices are required to have a safety label on the device or original packaging, or a manufacturer's specification sheet stating the class they fall under. Devices missing the required labels or spec sheets will not be permitted. Tournament officials and/or event supervisors may inspect each device and its proposed usage to determine if it is safe. Their decision is final.

Laser Device Classifications:

There are 2 systems of laser classification: the old 'FDA' system and the revised 'IEC' system.

Class FDA	Class IEC	Laser Product Hazard	Product Examples	Allowed in Science Olympiad Events
I	1 1M	Considered non-hazardous. Hazard increases if viewed with optical aids, including magnifiers, binoculars, or telescopes.	<ul style="list-style-type: none"> • laser printers • CD players • DVD players 	YES
IIa II	2 2M	Hazard increases when viewed directly for long periods of time. Hazard increases if viewed with optical aids.	<ul style="list-style-type: none"> • bar code scanners 	YES
IIIa	3R	Depending on power and beam area, can be momentarily hazardous when directly viewed or when staring directly at the beam with an unaided eye. Risk of injury increases when viewed with optical aids.	<ul style="list-style-type: none"> • laser pointers 	YES
IIIb	3B	Immediate skin hazard from direct beam and immediate eye hazard when viewed directly.	<ul style="list-style-type: none"> • laser light show projectors • industrial lasers 	NO

			<ul style="list-style-type: none"> • research lasers 	
IV	4	Immediate skin hazard and eye hazard from exposure to either the direct or reflected beam; may also present a fire hazard.	<ul style="list-style-type: none"> • laser light show projectors • industrial lasers • research lasers 	NO

Table from: <http://www.fda.gov/radiation-emittingproducts/radiationemittingproductsandprocedures/homebusinessandentertainment/laserproductsandinstruments/ucm116362.htm>

High-Brightness LED Device Classifications:

Most common LEDs are low brightness and thus exempt from this policy. Standard IEC 62471-2006 specifies four risk groups. Dark blue colors pose the most risk and are not allowed.

Risk Group	Risk	Definition	Allowed in Science Olympiad Events
Exempt	None	No photobiological hazard	YES
RG-1	Low Risk	No photobiological hazard under normal behavioral limitation	YES
RG-2	Moderate Risk	Does not pose a hazard due to aversion response to bright light or thermal discomfort	YES
RG-3	High Risk	Hazardous even for momentary exposure	NO

Table from: IEC 62471 Photobiological safety of lamps and lamp systems - First edition, 2006-2007

References:

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

- <http://www.fda.gov/radiation-emittingproducts/radiationsafety/alertsandnotices/ucm153548.htm>
- <http://www.fda.gov/aboutfda/transparency/basics/ucm302664.htm>
- <http://www.fda.gov/radiation-emittingproducts/radiationemittingproductsandprocedures/homebusinessandentertainment/laserproductsandinstruments/ucm116373.htm>

U.S. Department of Labor Occupational Safety & Health Administration

- <https://www.osha.gov/SLTC/laserhazards/standards.html>
- <https://www.osha.gov/SLTC/laserhazards/hazards.html>

Laser Institute of America - Laser Pointer Safety

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