

Laser Cutter Safety and Maintenance Procedures

Laser Cutters are devices that use high-energy lasers to accurately cut and engrave material. Although laser cutters are considered Class I systems due to it being enclosed, non-beam hazards, such as electrocution, fire, or chemical exposure, can occur. This requires special awareness, administrative controls, and proactive measures to ensure property and personnel safety.

Prior to purchasing or installing a unit, the Laser Safety Officer, from Department of Environmental Health and Safety, must be contacted to perform an initial hazard analysis of the proposed laser cutter and working space. The following checklist should be followed in areas that use laser cutters. In addition to this checklist, Standard Operating Procedures (SOPs), are to be created and stored near the area of operation. This information is also required to be shared with users of the laser cutter.



Laser Cutters

DO	DO NOT
Follow BGSU Fire Safety Guidelines. These can be found on the Environmental Health and Safety (EHS) webpage under “Fire Safety”.	Perform in-house component testing, replacement, or equipment modifications to the laser cutter.
Have access to an approved fire extinguisher within the immediate work area.	Perform laser cutting without a written Standard Operating Procedure (SOP). Contact EHS/Laser Safety Officer for help, if needed.
Clean table, enclosure, top door and beam window, mirrors, and lens per manufacturer’s recommendations.	Leave a laser cutter unattended when it is actively in use.
Check for loose parts, maladjusted belts, or other abnormalities prior to use.	Use laser cutter on material not approved by the manufacturer or the instrument owner.
Clean bearings, tracks, fan filter, and belt per manufacturer’s recommendations.	Use extension cords to power a laser cutter. All laser cutters should be plugged into a proper electrical outlet based on manufacturer’s recommendations.
Lubricate lead screws routinely, per manufacturer’s recommendations.	Allow untrained or unauthorized personnel to use the laser cutter unless accompanied by a trained or authorized person.
Clean exhaust and duct, which is attached to the unit, at least once a year.	
Turn off laser cutter if flare-ups occur by hitting the Emergency Stop, or by following manufacturer’s recommendations.	

Ductwork, Filters, and Ventilation

DO	DO NOT
Periodic inspections to the filtration, ventilation, and/or ductwork system to ensure it is working properly.	Perform in-house component testing, replacement, or equipment medication to any filtration or ventilation system, outside of cleaning the unit and filter replacement.
Clean duct, cooling inlets, and outlets at least once a year.	Operate laser cutter or ventilation unit if error codes are present on the control panel.
Replace filter in accordance with the manufacturer's recommendation (i.e. 75% blockage for BOFA charcoal filters).	Change filters without consulting the manufacturer's safety manual to ensure proper personal protective equipment (PPE) and procedures are followed.
Consult Campus Operations and EHS before installing a new filtration or ventilation system, or making modifications to an existing system.	

Laser Cutter Standard Operating Procedures

Due to the physical and chemical hazards associated with the use of laser cutters, a written Standard Operating Procedure (SOP) must be written and tailored to the work conducted on the machine. Maintenance schedules are also required to be noted. The minimum frequency maintenance tasks should be conducted is what is recommended by the manufacturer, as noted in the manual for the laser cutter or filtration/ventilation system. A SOP template can be found on the EHS webpage under "Radiation and Laser Safety".