

HS017



HS Risk management form

For additional information refer to HS329 [Risk Management Procedure](#)

Faculty/Division: Faculty of the Built Environment		School/Unit: BE Design Laboratory		
Document number RA_ARJ210713	Initial Issue date 22/07/13	Current version V_01	Current Version Issue date 22/07/13	Next review date: July 2016

Risk management name Universal Laser Systems Model ILS9.150D Laser Engraving and Cutting System



Form completed by	Anthony Jones(Design Laboratory Manager)	Signature 	Date 22/07/13
Responsible supervisor/ authorising officer	Anthony Jones(Design Laboratory Manager)	Signature 	Date 22/07/13

Identify the activity and the location of the activity

Description of activity	General use of Universal Laser Systems Model ILS9.150D Laser Engraving and Cutting System
Description of location	Built Environment Design Laboratory. Room G09/ Building E4 'The Squarehouse' UNSW Kensington Campus

Identify who may be at risk from the activity:

This may include fellow workers, visitors, contractors and the public. The types of people may affect the risk controls needed and the location may affect the number of people at risk

Persons at risk	Staff, Students, Tutors and visitors
How they were consulted on the risk	Staff, Students, Tutors: Training/induction. Visitors: Restricted access notices.

List legislation, standards, codes of practice, manufacturer's guidance etc used to determine control measures necessary

- Work Health and Safety Act 2011
- Work Health and Safety Regulation 2011
- Universal Laser Systems, Inc.: 2007 Industrial Systems Laser Engraving and Cutting System Safety, Installation, Operation, and Basic Maintenance Manual.
- AS/NZS 2211 (series) Safety of Laser Products
- Laser Laboratory Inspection Checklist - Laboratory Safety of laser products Part 14: A user's guide-IEC 60825.14-2011
- Laser Laboratory Inspection Checklist -Laboratory.....Safety of laser products Part 1 : Equipment classification and requirements -IEC 60825.1-2011

Identify hazards and control the risks.

1. An activity may be divided into tasks. For each task identify the hazards and associated risks. Also list the possible scenarios which could sooner or later cause harm.
2. Determine controls necessary based on legislation, codes of practice, Australian standards, manufacturer's instructions etc.
3. List existing risk controls and any additional controls that need to be implemented
4. Rate the risk once all controls are in place using the matrix in HS329 Risk Management Procedure

SHADED GREY AREAS

If you need to determine whether it's reasonably practicable to implement a control, based on the risk complete the shaded grey columns

Feel free to resize the boxes to suit your situation/the amount of text you need to use

Task/ Scenario	Hazard	Associated harm	Existing controls	Any additional controls required?	Risk Rating			Cost of controls (in terms of time, effort, money)	Is this reasonably practicable Y/N
					C	L	R		
Installation/ removal of laser cartridge/s	Laser cartridge access cover	Impact/crush injuries when opening access cover	<ul style="list-style-type: none"> • Ensure hands are out of the way of any pinch-points when opening or closing cover. 	No	2	D	L		
	240volts AC Mains power supply	Electrocutio n, burns	<ul style="list-style-type: none"> • Ensure mains power cord has been removed from wall socket before installing/removing cartridge/s. • Ensure wiring is not trapped between cartridge and system when installing/removing cartridge/s. 	No	2	D	L		
General operation	Operation by untrained persons.	Fire/toxic fumes from incorrect equipment settings or use of unsafe materials.	<ul style="list-style-type: none"> • Approved training/induction system for operators. • Access to laser room equipment restricted to trained operators. • Laser room door locked when not in use. 	No	2	D	L		

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		Possible explosion from ignition of particulates in system. Burns from handling hot materials							
Loading material for cutting.	Upper/lower access doors.	Entrapment in door pinch points.	<ul style="list-style-type: none"> • Check to ensure that upper door has fully-opened and gas support struts have engaged. • Avoid wearing loose clothing and/or wearing of jewellery. • Awareness of body/machine proximity. 	No	2	D	L		
	Use of heavy or unwieldy materials	Strains, sprains, trips Cuts from sharp edges. Leg/foot injury from falling material	<ul style="list-style-type: none"> • Use of correct manual handling techniques. • Don't slide hands along edges of material. • Use gloves when handling sharp-edged materials. • Use of enclosed footwear as specified by SWP & local signage. 	No	2	D	L		
	Items left on floor	Impact with equipment or floor due to trip hazards.	<ul style="list-style-type: none"> • Regular cleaning of floor. • Adequate storage system in room to avoid need for leaving items on floor. • Avoid placing cables/leads in trafficable areas. 	No	2	D	L		
	Bystanders	Impacts, cuts, sprains, strains due to moving material in restricted space. Operator Distraction	<ul style="list-style-type: none"> • Restriction on total number of people allowed in the room at any one time. 	No	2	D	L		

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					C	L	R		
Focusing the laser beam	Focus carriage	Crush injuries to fingers through Entrapment between focus tool and focus carriage	<ul style="list-style-type: none"> Keep fingers out of the area between the focus tool and focus carriage. 	No	2	D	L		
	Out-of-focus laser beam	Ignition of material being cut. Higher- than -normal quantities of fumes and particulates being generated.	<ul style="list-style-type: none"> Use the focus tool before commencing cutting to confirm that the laser beam is in focus. 	No	2	D	L		
	Engraving table Z-axis drive system	Abrasions, cuts, crush injuries through Entrapment with drive feed screws	<ul style="list-style-type: none"> Avoid wearing loose clothing, jewellery or items that can get caught in the feed screws. Awareness of body/machine proximity. 	No	2	D	L		
Laser-cutting material	Irritant/ Toxic / caustic by-products (fumes)	Asphyxiation Respiratory problems	<ul style="list-style-type: none"> Approved fume extraction system. Use of MSDSs and equipment manual to confirm that material to be cut is considered safe. Visual checks that fumes are being properly extracted and aren't causing deterioration of the laser system (i.e. peeling or pitted paint, etching or rusting of metal components). Immediate investigation of any 'strange' odours during cutting. Scheduled maintenance. 	Install filtration system to deal with fumes & particulates contained in the exhaust from cutting.	3	D	M	Air quality monitoring report \$? Filtration design/install \$35,000	Yes - Subject to funding availability
	Laser beam (CO2 type)	Severe eye damage, physical burns from direct exposure to beam.	<ul style="list-style-type: none"> Safety interlocks fitted to front/top/side doors (disables the CO2 laser beam from firing when the doors are open). Laser beam completely contained in a Class 1 enclosure. Don't stare at the beam or view it directly with optical instruments. 	No	2	D	L		

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					C	L	R		
	Red Dot Pointer (Class 3R)	Eye damage	<ul style="list-style-type: none"> Don't stare at the Red Dot Pointer or view it directly with optical instruments. 	No	2	D	L		
	Motion system	Entrapment when system is moving.	<ul style="list-style-type: none"> Avoid wearing loose clothing, jewellery or items that can get caught in the motion system. Awareness of body/machine proximity. 	No	2	D	L		
	Ignition of combustible materials being cut/etched	Physical burns Damage to laser system	<ul style="list-style-type: none"> Constant supervision of the cutting/etching process. Removal of any particulate materials from the interior of the laser-system after laser processing has finished. Fire extinguisher (CO2 type) kept next to the laser-cutting equipment. Integral over-temperature sensor/alarm in laser system monitors temperature of the work area. If an unusually high temperature is detected the system will turn off the laser and trigger an audible alarm. 	No	2	D	L		
	Heat from recently cut materials	Physical burns	<ul style="list-style-type: none"> Allow materials to cool properly before handling. 	No	2	D	L		
	Intense light at the point where the CO2 laser beam cuts material	Eye damage	<ul style="list-style-type: none"> Don't stare at the light or view it directly with optical instruments. 	No	2	D	L		
	Cooling fan filters	Permanent damage to system if not installed/maintained properly	<ul style="list-style-type: none"> Ensure filters are in place before powering-on the system. Periodic checking/cleaning of filters as per maintenance schedule. 	No	2	D	L		
Use of 'Air-Assist' System	Compressed air supply	Dust/particles blown into eyes when accessing focus carriage. Ruptured air hoses/valves when pressure set higher than recommended. Damage to	<ul style="list-style-type: none"> Turn-off compressed air supply before attempting to remove focus carriage access cover. Set initial pressure at level recommended in equipment manual. Periodic checks of air pressure gauge in laser room to ensure level remains within recommended limits. Use an oil/water/particulate-free air supply. Periodic checks for signs of 	No	2	D	L		

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		system from Oil/water/particulates contamination	oil/water contamination in the system. Maintenance schedule for air compressor.						
	Build-up of cutting debris on Air-assist cone	Fumes/Ignition of built-up debris.	<ul style="list-style-type: none"> Periodic inspection /cleaning of cone to avoid build-up of debris. 	No	2	D	L		
System servicing (electrical)	High voltage electronics	Electrocution/ burns	<ul style="list-style-type: none"> Switch-off the laser system and disconnect mains power cord before attempting to open any electronics or laser enclosure access doors. Electrical servicing to be done only by approved service technicians. 	No	2	D	L		
System servicing (cleaning)	High voltage power supply	Electrocution/ burns	<ul style="list-style-type: none"> Switch-off the laser system and disconnect mains power cord before attempting to open any electronics or laser enclosure access doors. 	No	2	D	L		
	Dust/particulates	Illness through ingestion /inhalation /contact	<ul style="list-style-type: none"> Use appropriate PPE (rubber gloves, P2 dust mask) when performing cleaning. Dispose of waste material in an approved manner. 	No	2	D	L		
	Broken/damaged mirrors and lenses	Laser system components heat up beyond design tolerances due to reduced reflectivity of mirrors/lenses.	<ul style="list-style-type: none"> Check condition of mirrors/lenses daily (clean if dirty using approved procedure as described in equipment manual). Don't clean mirrors/lenses immediately after a cutting session (they will be hot) – wait until they cool down to room temperature before cleaning. 	No	2	D	L		

List emergency procedures and controls

List emergency controls for how to deal with fires, spills or exposure to hazardous substances and/or emergency shutdown procedures

In case of fire in laser: Press emergency stop button (rear-left of laser control panel), turn-off all extraction systems, lift top door of laser & extinguish fire with CO2 extinguisher.

In case of exposure to fumes from laser: Press emergency stop button (rear-left of laser control panel), keep extraction systems turned-on, all persons to evacuate laser room then close the door. Notify lab staff.

Emergency shutdown procedure: Press emergency stop button (rear-left of laser control panel), confirm laser has stopped and that there is no fire present, turn-off all extraction systems.

Implementation

Additional control measures needed:	Resources required	Responsible person	Date of implementation
Install approved filtration system to deal with fumes & particulates from cutting.	Air-quality report to assess emissions from the current exhaust outlet (Noel Arnold & Assoc.) Construction/Purchase/installation of customised filtration system (based on results from air-quality report).	Anthony Jones(Lab Manager)	When funds become available.

REVIEW

Scheduled review date: July 2016			
Are all control measures in place?			
Are controls eliminating or minimising the risk?			
Are there any new problems with the risk?			
Review by: (name)			
Review date:			

Acknowledgement of Understanding

All persons performing these tasks must sign that they have read and understood the risk management (as described in HS329 Risk Management Procedure).

Note: for activities which are low risk or include a large group of people (e.g. open days, BBQ's, student classes etc), only the persons undertaking the key activities need to sign below. For all others involved in such activities, the information can be covered by other methods including for example a safety briefing, induction, and/or safety information sheet (ensure the method of communicating this information is specified here)

Risk management name and version number:			I have read and understand this risk management form		
Name	Signature	Date			
