

NC STATE UNIVERSITY Safety Plan Report

Plan Number	218	Last Approved	05/15/2020
Building	038	Expiration Date	02/03/2021
Room	118	Accessed	07/07/2020
Address	111 Lampe Dr. Raleigh, NC 27607		

Investigators

Daniel Leonard - Principal Investigator			
Department	Fitts Dept of Industrial and Systems Engineering	Office Phone	919-515-2361
Office Building		Home Phone	919-609-0741
Campus Box		Email	drl@ncsu.edu
Room			

Jason Low - Secondary Safety Contact			
Department	Fitts Dept of Industrial and Systems Engineering	Office Phone	919-515-1424
Office Building		Home Phone	919-454-7090
Campus Box		Email	jclow@ncsu.edu
Room			

Authorized Personnel

Personnel	Email
None	

Emergency Contacts

Contact	Number
Daniel Leonard -- Lab Supervisor	919-515-2361
Campus Emergencies	919-515-3333
Carolinas Poison Center	800-848-6946
Environmental Health and Safety Center	919-515-7915
Wake Medical Canter Emergency	919-350-8000

Target Equipment + Hazards

Cranes and Hoists	Cranes, hoists, and other lifting equipment must be inspected, 'frequently' and 'periodically.' Load limits must be clearly marked. Cranes must be load tested according to the manufacturer's requirements.
Electrical - High Voltage	There is a potential for arc flash at any voltage over 50 volts. Never remove the cover of an electrical panel or attempt to do work in an electrical panel. Keep the area in front of all electrical service equipment clear for 36" and from floor to ceiling.
Induction Heaters	Purchase must be approved by EHS. Contact the EHS Equipment Safety Engineer at

	513-1422 or env-health-safety-eng@ncsu.edu. Commercially available and custom built units must be listed and labeled by a nationally recognized testing laboratory (UL, CSA, etc.).
Machine Shops - Machine Guarding	Make sure all moving parts are guarded to prevent users from touching or getting clothing caught in rotating shafts or bearings, in-running nip points, cutting or shearing tools, pinch points, or power transmission gear. Look for belts, gears, shafts, pulleys or other moving parts.
Noise Exposure - Hearing Protection Needed	There maybe equipment or processes that may present exposure to high level of noise. Employees/staff may need to be included in the Hearing Conservation Program: https://ehs.ncsu.edu/health-safety/occupational-health/hearing-conservation/

Target Chemicals

None Apply	
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Biological Hazards

None Apply

Hazardous Waste

Chemical	Biological	Radiological
Room: 118	N/A	N/A

Processes

Equipment ONLY - Injection Molding

Description
injection molding of hot fluid plastic under high pressure

Equipment	Other Equipment
None Apply	None

Hazards		
Hazard	Controls	Additional Controls
Chemicals - Inhalation	Use proper local exhaust device. Avoid dispensing/opening bottles outside the fume hood.	
Energy Sources - Hot surfaces > 120 F	Enclose or otherwise cover hot parts to prevent inadvertent contact; use signage or labels to indicate hot surface hazards.	welding gloves are provided for working near high-temperature nozzle and barrel
Energy Sources - Working pressure > 15 psig	Use commercially-available, rated equipment where available; provide for safe release of pressure to prevent equipment rupture or explosion; perform a Hazard Review of the entire process; contact the EHS Equipment Safety Engineer for assistance.	do not defeat safety interlocks -- molder must be completely closed while operating under pressure

Engineering Controls	
Equipment	Controls

Snorkel	turn on exhaust ventilation if warranted by material being melted
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Personal Protective Equipment

Part of body	Hazard	PPE needed	PPE type/description
Eye	Impact	Safety Glasses	eye protection required at all times while in the shop

Equipment AND Hazardous Materials - Plastic Mold Making using two-part curative agents

Description
silicone rubber poured around master part; resin cast into evacuated cavity

Equipment	Other Equipment
None Apply	None

Chemicals	Other Chemicals
None Apply	methylene diisocyanates, polysiloxanes, petroleum solvent

Hazards		
Hazard	Controls	Additional Controls
Chemicals - Toxic substance	Keep in secured location, use proper warning labels, use in a designated fume hood. Assess and use proper PPE.	

Engineering Controls	
Equipment	Controls
Other	ensure that area is properly ventilated

Personal Protective Equipment			
Part of body	Hazard	PPE needed	PPE type/description
Hand	Chemical Exposure	Gloves	Nitrile gloves
Foot	Chemical Splash	Non-conductive Footwear	closed-toe shoes which cover the instep are required at all times in the shop

Equipment ONLY - Metallic Molding, Sand Casting, Die Casting

Description
heated liquid metals poured into molds or injected into dies

Equipment	Other Equipment
None Apply	None

Hazards

Hazard	Controls	Additional Controls
Energy Sources - Hot surfaces > 120 F	Enclose or otherwise cover hot parts to prevent inadvertent contact; use signage or labels to indicate hot surface hazards.	

Engineering Controls	
Equipment	Controls
Snorkel	turn on exhaust ventilation when working with molten metals

Personal Protective Equipment			
Part of body	Hazard	PPE needed	PPE type/description
Body	Heat/Burn	Lab Coat	fire-resistant apparel
Hand	Heat/Burn	Gloves	use gloves to handle vessels containing molten metals
Eye	Impact	Safety Goggles	eye protection is required at all times while in the shop

Equipment ONLY - Machining Raw Materials: Wood, Plastic & Metal Alloys

Description
manual and CNC removal processes

Equipment	Other Equipment
Machine Shops - Machine Guarding	None
Noise Exposure - Hearing Protection Needed	

Hazards		
Hazard	Controls	Additional Controls
Mechanical - Caught in moving or rotating part(s)	Guard or cover all rotating and moving parts that might grab or pull clothing, tools or body parts to prevent inadvertent contact; ensure guards require a tool to remove; use warning labels or signs to alert others of the hazard; train users as to the hazards; conduct a Hazard Review.	
Mechanical - Contact with sharp or pointed parts	Guard, cover or intentionally dull all sharp or pointed parts, edges, etc. to prevent inadvertent contact; ensure guards require a tool to remove; use warning labels or signs to alert others of the hazard; train users on the hazards; conduct a Hazard Review	
Mechanical - Struck by moving or rotating part(s)	Guard or cover all rotating and moving parts that might strike or contact body parts to prevent inadvertent contact; ensure guards require a tool to remove; use warning labels or signs to alert others	

	of the hazard; train users on the hazards; conduct a Hazard Review.	
Noise/Radiation - High noise levels	Exposure to an 8-hour time weighted average (TWA) of 85 decibels or more noise requires assessment and control. A general rule of thumb for detecting excessive noise levels is if you have to raise your voice when talking to someone 3 feet away Complete and submit a Noise Exposure Hazard Assessment form to EHS for review.	Ear Plugs

Engineering Controls

Equipment	Controls
None Apply	

Personal Protective Equipment

Part of body	Hazard	PPE needed	PPE type/description
Eye	Impact	Safety Glasses	eye protection is required at all times while in the shop
Hand	Puncture	Gloves	use cotton or leather gloves to handle sharp tools, sheet metal and other materials, but not while operating rotating machinery
Hand	Cut	Gloves	do not use gloves while operating rotating machinery
Foot	Impact	Non-conductive Footwear	closed-toe shoes which cover the instep are required at all times in the shop
Ears	High Noise Levels	Ear Plugs	ear plugs and ear muffs are available to protect hearing from some processes
Head	Impact	Hard Hat	use a hair tie, hair clip, hair net or cap (or hard hat, if necessary) to constrain hair, which can be caught in rotating machinery

Equipment ONLY - Electrical Discharge Machining (EDM)

Description
removing metal with high-amperage electrical spark

Equipment	Other Equipment
None Apply	None

Hazards		
Hazard	Controls	Additional Controls
Chemicals - Inhalation	Use proper local exhaust device. Avoid dispensing/opening bottles outside the fume hood.	ventilation exhaust is provided at the machine

Engineering Controls	
Equipment	Controls
None Apply	

Personal Protective Equipment			
Part of body	Hazard	PPE needed	PPE type/description
Hand	Chemical Exposure	Gloves	nitril gloves to shield from dielectric fluid

Equipment ONLY - Welding

Description
joining metals through application of heat generated by high electrical current

Equipment	Other Equipment
None Apply	None

Hazards		
Hazard	Controls	Additional Controls
Chemicals - Inhalation	Use proper local exhaust device. Avoid dispensing/opening bottles outside the fume hood.	
Energy Sources - Hot surfaces > 120 F	Enclose or otherwise cover hot parts to prevent inadvertent contact; use signage or labels to indicate hot surface hazards.	
Electrical - Contact with energized parts	Enclose or otherwise cover energized parts to prevent inadvertent contact; use warning labels to communicate electrical contact hazard; restrict access to qualified persons.	
Chemicals - Toxic substance	Keep in secured location, use proper warning labels, use in a designated fume hood. Assess and use proper PPE.	
Noise/Radiation - Ultraviolet radiation	Requires proper signage and EH&S hazard assessment. Will require additional PPE for open sources. Review the following link for further information: https://drive.google.com/file/d/0B36FhbUXVzebbIB2WExDdGNRRTQ/view	

Engineering Controls	
Equipment	Controls
Other	turn on ventilation exhaust prior to generating fumes

Personal Protective Equipment			
Part of body	Hazard	PPE needed	PPE type/description

Body	Heat/Burn	Welding Jacket	leather or flame-resistant fabric jacket protects against molten ejecta and against intense UV radiation
Foot	Impact	Non-conductive Footwear	closed-toe shoes which cover the instep are required at all times in the shop
Eye	Radiation	Safety Glasses	welding helmet with darkened eye shield
Eye	Impact	Safety Glasses	eye protection is required at all times while in the shop

Chemical Inventory

Room	Chemical Name	CAS	Location	Num of Containers	Qty per Container	Physical State	Recieved Date
118	3M Adhesive Spray 90	79-20-9	LFC	2	500 g	liquid	01/22/2018
118	Acetone	67-64-1	LFC	1	4 L	liquid	
118	adhesive remover	1330-20-7	LFC	1	32 oz	liquid	
118	dry graphite spray lube	108-88-3	LFC	9	10 oz	solid	
118	Great Stuff foam sealant	9016-87-9	LFC	2	12 oz	liquid	
118	ink remover	109-60-4	LFC	1	12 oz	liquid	
118	propane	74-98-6	LFC	7	8 oz	gas	
118	purple primer	108-94-1	LFC	1	8 oz	liquid	
118	spray layout ink	71-36-3	LFC	3	12 oz	liquid	
118	spray paint	108-88-3	LFC	1	12 oz	liquid	
118	spray paint	108-88-3	LFC	2	15 oz	liquid	
118	stain	123-86-4	LFC	5	8 oz	liquid	
118	Super Shield nickel conductive coating	108-88-3	LFC	1	12 oz	liquid	