

Subject: Academic Machine Shop Safety	Date: 03/25/2021
EH&S Program: Occupational Safety	Next Review:
Scope: University wide	Original: 12/12/2011

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Policy:

All academic machine shops provide for the safe handling and use of machine/tools through safety requirements including, but not limited to, access controls, training, work rules, and procedures.

Definitions:

Independent Authorized User: A person qualified to work in a Machine Shop. This person must have (**please check B.2 for specific instructions for students*):

- Stony Brook University ID
- Successfully completed specific shop course or otherwise approved by the supervisor
- Successfully completed EH&S course EOS 029 Machine Shop Safety
- Signed Machine Shop Safety Rules (or other equivalent documents) and agree to abide by all rules

Academic Machine Shop: An academic workshop or area, including a research or teaching laboratory, where power tools are used. These tools include, but not limited to, electrical hand tools (such as drills, grinding machines, and impact drivers), lathes, milling machines, table saws and drill presses.

Personal Protective Equipment (PPE): Equipment worn to minimize exposure to hazards that may cause serious workplace injuries and illnesses. Personal protective equipment may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests, and full body suits.

Hand tool: a tool held in the hand and operated without electricity or other power.

Procedures:

A. Responsibilities

1. **Supervisor must:**

- a. Enforce the EH&S and shop specific "Machine Shop Safety Rules" (or other equivalent documents).
- b. Maintain records, which include:
 - 1) Training records for the shop specific safety training
 - 2) Safety agreements signed by students
 - 3) Sign in book showing who is using equipment as appropriate

- 4) Safety Data Sheets (SDSs) and chemical inventory for all hazardous materials in the shop
 - 5) [Accident / injury forms](#) for any accident that occurs in the area
- c. If emergency shut off switches or buttons are available on hazardous machines (such as a lathe), ensure they are visible, accessible, and functioning.
 - d. Enforce the use of Personal Protective Equipment (PPE) by everyone working on or near the tools and ensure the PPE is appropriate for the hazards. The *Machine Shop Tool Risk Assessment* in Appendix 2 can be used for the assessment.
 - e. Maintain (documented, *The Equipment Maintenance/ Repair Log* in Appendix 1 can be used) and regularly inspect all equipment for safe operating conditions, adjustments and repairs in accordance with the manufacturer's information. The *Machine Shop Inspection Checklist* in Appendix 3 can be used as part of the inspection. This inspection includes:
 - 1) All power cords
 - 2) Machine guards and safeguarding devices
 - f. Establish Lock-Out Tag-Out (LO/TO) procedures during servicing and/or maintenance of machines and equipment.
 - g. Provide instruction on machine/tool use to all users according to manufacturer's requirements. *The Machine Shop Tool Risk Assessment* in Appendix 2 can be used as part of this training. At a minimum, this training includes:
 - 1) The function, location and use of controls
 - 2) Specific startup and stopping procedures
 - 3) A safe method for installing, removing, and adjusting tooling
 - 4) The location and method for installation and adjustment of protective devices and guards, and method to test the proper function
 - 5) Safe working procedures
 - 6) How to report if there is any apparent defect, damage, malfunction or inconsistent or unpredictable performance of the machine/tools
 - 7) Any specific training recommended by the manufacturer
 - 8) Methods to identify when equipment is "out of service" , when appropriate
 - 9) Location of safety/emergency supplies (eyewash station, fire extinguisher, etc.)
 - 10) How to prepare and respond to emergencies.
 - h. Determine who can make minor repairs to machines/tools or take machines "out of service" until repairs are made by qualified technician/staff.
 - i. Keep doors to shop locked or secured when no one is working.

- j. Investigate all accidents and near-miss incidents and ensure timely correction of unsafe conditions.

B. Procedure

1. Only independent authorized users can work with machines and tools (see definition above).
2. Working alone:
 - a. Undergraduate students* are prohibited from working with tools unless there is an independent authorized user trained for using this specific tool presents.
(*Exception: students hired specifically for working in the shop, and are fully trained by the supervisor)
 - b. Graduate students and Postdoctoral associates discuss their planned activities with their Principal Investigator (PI) and supervisor prior to conducting work alone. This practice is permitted only after a [risk assessment](#).
3. Appropriate attire working with hazardous machines and equipment:
 - a. No loose garments
 - b. Long pants
 - c. Closed-toe shoes
 - d. No jewelry, rings, hanging earrings, neckties, chains, hoodie drawstrings, etc.
 - e. Shoulder length or longer hair must be tied up and secured (not hanging), or in a hat or hair net
4. Wear appropriate PPE as designated by the supervisor and in accordance with *Machine Shop Tool Risk Assessment* in Appendix 2.
5. Any personal tools brought by students/staff are inspected by supervisor before they are permitted to be used in the shop.
6. All applicable policies, procedures and instructions for working with the tools are followed. Non-compliance will result in loss of "independent authorized user" status. User may no longer be allowed to work in the machine shop based on the supervisor's discretion.
7. Machine guards are kept in place while operating equipment, when appropriate. If machine guards need to be adjusted or removed under special circumstances, permission is granted by the supervisor. Once the task is completed, machine guards are returned to their original position.
8. Do not leave a machine running unattended unless designed for that purpose.
9. The use of any personal electronic device is prohibited while operating power driven equipment, apparatus or hand tools.

10. Tools may not be used in an unsafe manner. Use right tools for the right job. Always consult the supervisor for troubleshooting or other uncertainties with a machine/tool. Follow the department Lock-Out Tag-Out (LO/TO) procedures if any equipment or hand tool in need of repair.
11. Before working with any machine/tool, ensure the work area is clean, and free of debris and clutter.
12. Maintain good housekeeping. Items are not placed where they may cut or fall on someone, into a machine, or where they may cause a tripping hazard. Sharp-edged or pointed tools are sheathed or stored in tool boxes.
13. When working with solvents, resins or other chemicals, students, faculty and staff complete [ELS 002 Lab Safety Chemical Hazards](#) and [ENV 001 Hazardous Waste Management](#). Be aware of the hazards associated with each chemical. Review safety data sheets (SDSs) and manufacturer instructions prior to use. Minimize the potential for exposure using available controls, and collect chemical waste as required (EH&S [Hazardous Waste Management](#) policy).
14. Report all accidents
(<https://ehs.stonybrook.edu/programs/laboratory-safety/laboratory-emergencies/accidents-injury-reports>).
15. Every machine shop is required to have:
 - a. A door sign stating: "Authorized Personnel Only" ([Laboratory Emergency Information template](#) can be used)
 - b. A fire extinguisher available in close proximity to the shop – this is generally located in the corridor (any questions, please contact EH&S Fire Safety)
 - c. Emergency eyewash if the eyes of any person may be exposed to injurious corrosive materials.
 - d. Emergency phone numbers posted (including emergency numbers of University Police and the supervisor)
 - e. Rules specific to the machine shop, operating manuals or other equivalent resources of each piece of equipment be readily available to all users.
 - f. Compressed air guns (if available) be reduced to 30 psi or less (reduce pressure at compressor *OR* use safety nozzle)

Forms:

- A. Equipment maintenance log (Appendix 1)**
- B. Machine shop risk assessment (Appendix 2)**
- C. Machine shop safety audit (Appendix 3)**
- D. Student accident form**

(<https://www.asa.stonybrook.edu/asa/asaforms/Department/EHS/Document/EHS D0333>)

E. State employee injury/illness incident report

(<https://www.asa.stonybrook.edu/asa/ASAForms/Department/HRS/Document/SU SB3019>)

F. Research foundation work-related employee injury/illness incident Report

(<https://www.asa.stonybrook.edu/asa/ASAForms/Department/HRS/Document/HR SF0122>)

G. Laboratory emergency information

(<https://ehs.stonybrook.edu/programs/laboratory-safety/laboratory-emergencies/Laboratory%20Emergency%20Information%20Template.pdf>)

Policy Cross Reference:

[Control of hazardous energy \(lockOut/tagOut\)](#)

[Hazardous waste management](#)

[Laboratory safety policy](#)

[Working alone in research labs](#)

Relevant Standards/Codes/Rules/Regulations/Statutes:

A. Occupational Safety and Health Administration (OSHA)

1. 29 CFR 1910. xxx

a. 212 Machinery and machine guarding

b. 243 Hand and portable powered tools and other hand-held equipment

c. 147 The control of hazardous energy (lockout/tagout)

d. 242(b) Compressed air guns

e. 144 Safety color code for making physical hazards

f. 151 Medical and first aid

B. American National Standards Institute (ANSI)

1. ANSI B11.0-2010

Safety of machinery – general requirements and risk assessment

2. ANSI B11.6-2001 (R2007)

Safety requirements for manual turning machines with or without automatic control

3. ANSI Z308.1-2014

Minimum requirements for workplace first aid kits and supplies

4. ANSI Z87.1-2015

American national standard for occupational and educational personal eye and face protection devices.

C. NFPA 79 (2015) Electrical standard for industrial machinery

References and Resources:

NA

APPENDIX 2. MACHINE SHOP RISK ASSESSMENT

This list is not all-inclusive. Not all hazards will apply to a particular machine/tool. Always refer to the manufacturer's instruction manual for specific information.

Hazard Class	1	2	3	4	5
Power	Low power hand/small bench tools (2-4 amp @ 120 VAC, <9V cordless)	Medium power tools (1/4 to 1/2 hp; <10 amp @120 VAC; 14-18V cordless; specialized enclosed NC- computer tools)	Powerful portable and small benchtop tools (<1/2 hp; 10-15 amps @ 120 VAC; 24-36V portable, pneumatics, hydraulics)	Light industrial tools (typically benchtop; >1/2 hp, pneumatics, hydraulics)	Large industrial tools (manual and NC-controlled)
Common Examples	<ul style="list-style-type: none"> • Dremel tool • Cordless drill under 18V • Palm Sander • Soldering iron/gun • Heat gun • Hot melt glue gun 	<ul style="list-style-type: none"> • Jig Saw • Corded devices <1/3 hp • 18-24V cordless drill • Laser cutter/engraver • Thermal foam cutter 	<ul style="list-style-type: none"> • Circular saw • Hand held belt sander • Framing nailer • ½ hp geared drill • Reciprocating saw • >18V cordless tool • Chop/miter saw • Router • Mini-lathe • Angle grinder • Small press 	<ul style="list-style-type: none"> • Small bandsaw • Small drill press • Small/benchtop milling machine • Small/benchtop lathe • Belt/disc sander • Horizontal saw • Scroll saw • Sewing machine • Planer/jointer • Bench grinder • 	<ul style="list-style-type: none"> • Full sized milling machine • Full sized metal lathe • Table saw Radial arm saw • Large drill press • Large band saw • Surface grinder • Large jointer/planer • Shaper/molder • Power shear • Industrial press
Potential Injuries	Cuts Eye injuries Abrasions Minor burns Minor struck-by flying objects Electric shock	<i>As for Class 1, plus:</i> Lacerations Punctures Minor crushing injuries	<i>As for Class 2, plus:</i> Severe bleeding Minor amputations Minor entanglement	<i>As for Class 3, plus:</i> Entanglement	<i>As for Class 4, plus:</i> Immediately life threatening injury or death
Potential Severity	Low: First Aid	Medium: First Aid or minor injury; requiring emergency room visit	High: Immediate emergency room visit; Permanent disability of disfigurement		Highest: Serious injury or death

Task	Hazard	Danger Zone	Risk Reduction Methods
Workpiece clamping	Crushing	Between fixed and moving part including work clamping (chuck or tailstock) and tool magazine	<u>Safeguarding:</u> <i>Guards:</i> Fixed, interlocked, adjustable, moveable <i>Devices:</i> Movable barrier devices; Light curtains/beam device; Two-hand operating lever, trip and control device; Safety mat device <i>Awareness:</i> Barriers; Signals; Safety signs <i>Other measures:</i> Safe-distance guarding <u>Equipment:</u> Emergency Stop device (palm or push button) Safety blocks, locking pins or limiting pins Slide locks Work holding equipment Process malfunction, detection & monitoring equipment Safety interface/relay modules Shields Enabling devices Hold-to-run controls Measures for isolation and energy dissipation <u>Information and Training:</u> Signage Instruction Operating Manuals Safe Work Procedures Supervision Permit-to-work system Personal Protective Equipment
Whipping bar stock	Crushing	Either end of spindle	
Moving axis	Shearing	Between tool/spindle and table	
Spindle or tool running or cutting	Cutting or severing	At spindle or tool	
Part feeding	Entanglement	By moving part including bar feed and tool magazine	
Rapid travel of table or spindle head	Drawing in or trapping	Envelope of movement of workpiece on table axes or tool in spindle head	
Moving or rotating tool	Entanglement/entrapment	By moving parts	
	Impact	At spindle or tool	
	Stabbing or puncture	At sharp tool faces	
Maintenance or repair	Electrical contact (direct or indirect) Crushing Cutting Trapping	Direct or indirect contact with normally live parts	
		Near moving parts	
		Electrical noise	
		Electrostatic discharge	
		Arc flash hazard	
		Improper wiring or grounding	
		Liquid or wet locations	
		Overvoltage or overcurrent	
Insulation failure (vibration or thermal cycling)			
Control system failure: Modification of control system Defect or failure of one or several components of the control system Variation or failure in power supply to control system Inappropriate selection, design or location or control devices	Crushing Shearing Cutting Severing Entanglement Trapping Impact Puncture Electrical contact	Dropping or ejection of a mobile part of the machine or of a workpiece clamped by the machine	
		Failure to stop moving parts	
		Machine action resulting from defeating or failure of safeguarding devices	
		Uncontrolled speed change	
		Unintended or unexpected start-up	

This list is not all-inclusive. Not all hazards will apply to a particular machine. Always refer to the manufacturer's instruction manual for specific information. Based on Yale EH&S Student Shop Safety Policies & Procedures, ANSI B11.0 and B11.

APPENDIX 3. MACHINE SHOP INSPECTION CHECKLIST

Location:	Date:
Shop Supervisor:	Inspected By:
General Safety Not applicable to this Shop <input type="checkbox"/>	
1. Do employee(s)/student(s) have SBU ID?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
3. Is the student(s) authorized to work alone?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
4. Are the employee(s)/student(s) appropriately dressed for working on machines?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
5. Did the employee(s)/student(s) successfully complete EH&S (On-Line/Live) Machine Shop Safety?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
6. Did the student(s) read the "Machine Shop Safety Rules" and sign the "Machine Shop Safety"?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
7. Did the student(s) receive proper safety training by machine shop supervisor prior to using or they are in the process of receiving training?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
8. Long loose hair must be contained in a scarf, under a cap or other fashion when operating machinery.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
9. Loose clothing, loose neck wear and jewelry are not being worn when operating or in close.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
10. Are safety signs (danger, warning or caution, etc.) posted where necessary?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
11. Is an "Authorized Personnel Only" sign posted?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
12. Is student(s) access limited to regular hours of operation if appropriate?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
13. Is protective eyewear worn when working on or near any machine creating eye hazard?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
14. Are there manufacture's manual or other reference manuals available?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Housekeeping <i>Inspect all shop areas for the following:</i> Not applicable to this Shop <input type="checkbox"/>	
15. Is the shop floor free from slip, trip, and fall hazards (water, oil, debris, etc.)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
16. Are shop materials, including scrap, stored in a safe manner?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
17. Are shop tools safely stored away and not left on machines?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
18. Are oily rags stored in appropriate metal containers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Electrical Safety <i>Inspect all power tools, machinery, electrical receptacles and extension cords for the following:</i> Not applicable to this Shop <input type="checkbox"/>	
19. Have damaged, defective equipment been removed from service? (Ex. missing ground prongs, cut/pinched cords, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
20. Are hand-held power tools either grounded or marked as "double insulated"?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
21. Are GFCIs used in wet or damp locations?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
22. Is the area free of recognized electrical hazards that are likely to cause death or serious physical harm? (Ex. missing knockouts, missing circuit breakers, missing/broken/damaged covers, exposed live electrical components, open/unlocked electrical panels, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A

23.	Are circuit breaker panels unobstructed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
24.	Extension cords rated for "heavy duty"?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
25.	Extension cords in good condition? (i.e. no missing ground prongs, cord not damaged)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
26.	Extension cords protected from damage? (i.e. not run through doors, windows, on floors where	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Eyewash Stations <i>Inspect all eye wash stations for the following:</i>		Not applicable to this Shop <input type="checkbox"/>		
27.	Is the required eye wash station available?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
28.	Eyewash flushed on a weekly basis?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
29.	Eyewash station ready to use? (i.e. access not blocked)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
30.	Eyewash station clearly labeled?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
31.	Eyewash station functioning properly? (i.e. water flows at the appropriate rate)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Fire Safety <i>Inspect flammable liquids and combustibles and other fire issues for the following:</i>		Not applicable to this Shop <input type="checkbox"/>		
32.	Flammable liquids (total load >25 gallons) stored in approved flammable liquid cabinets?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
33.	Flammable liquid cabinets located away from ignition sources and exits?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
34.	Combustibles minimized and stored properly (i.e. at least 3' away from ignition sources, not violating proper ceiling clearances)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
35.	Exits, corridors, stairways, and aisles unobstructed?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
36.	Exits, where not obvious, marked with appropriate exit sign(s)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Hazard Communication <i>Inspect hazardous chemical products for the following:</i>		Not applicable to this Shop <input type="checkbox"/>		
37.	Is there a chemical inventory list of all hazardous chemicals readily available?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
38.	Are Safety Data Sheets (SDS) readily available for all hazardous materials in the shop?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
39.	Are all hazardous substances properly labeled, used and stored?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
40.	Are satellite accumulation areas properly maintained?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
41.	Is universal waste (used florescent bulbs/batteries) labeled and stored properly?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Machinery <i>Inspect each piece of machinery for guarding and safety issues:</i>		Not applicable to this Shop <input type="checkbox"/>		
42.	Are all machines and rotating equipment properly adjusted and guarded?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
43.	Are all machines free of debris?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
44.	Are all machines securely anchored to prevent "walking"?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
45.	Do dust-generating tools and machinery have adequate controls to minimize dust?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
46.	Are all emergency shut-off switches, brakes, etc. working properly and labeled?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
47.	Is there a hook or a brush available to remove debris from machinery?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Personal Protective Equipment <i>Inspect all PPE use:</i>		Not applicable to this Shop <input type="checkbox"/>		
48.	Are safety glasses made available to visitors before entering the shop area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
49.	Is PPE available and being worn by shop personnel and students?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
50.	Are signs for PPE use posted?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Compressed Air		Not applicable to this Shop <input type="checkbox"/>		
51.	Is compressed air used for cleaning regulated to 30 psi?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
52.	Clothes are not being cleaned (dusted off) with compressed air?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A

Welding/Cutting (Hot Work) <i>Inspect welding/cutting areas for the following:</i>		Not applicable to this Shop <input type="checkbox"/>		
53.	Are protective screens or dividers provided to protect against welding arc, sparks and slag?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
54.	Is the area free from flammables and combustible materials?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
55.	Are welders wearing appropriate clothing and PPE to protect from sparks, slag, and UV light?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
56.	Is there adequate ventilation in the area?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
57.	Are the welding leads in good condition?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Compressed Gas Cylinders <i>Inspect all compressed gas cylinders for the following:</i>		Not applicable to this Shop <input type="checkbox"/>		
58.	Oxidizers and fuel gases in storage separated by at least <input type="checkbox"/> 20 feet or by a <input type="checkbox"/> 5-foot wall with a 30-minute fire resistance rating (if not supplied on demand) (Exception: oxygen and acetylene)?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
59.	Are individual cylinders labeled as to their contents?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
60.	Cylinders properly secured by a chain or stand to prevent tip over and damage?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
61.	Oxygen/acetylene cylinders in use securely fastened to prevent them from failing or being knocked over?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
62.	Regulators removed and replaced with cylinder caps when not "in use"?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
63.	Are all regulators at 0 psi when off?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
Overhead Cranes, hoists, etc. <i>Inspect all cranes, hoists, chain falls, etc. for the following:</i>		Not applicable to this Shop <input type="checkbox"/>		
64.	Rigging (i.e. slings, shackles, etc.) in good condition? (no broken strands, kinking, damage,	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
65.	Are chains & hoists inspected in accordance with manufacturer's requirements?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
66.	Are load capacity signs clearly posted?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
67.	Crane/hoist and the lift path properly barricaded?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A
68.	Hard hats available and used during lifts?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A