



MACHINE SHOP SAFE WORK PRACTICES

This document, developed in collaboration with Harvard's schools and departments and Shop Supervisors from across the University, sets forth the minimum safe work practice requirements for Harvard's machine shops. It is intended to ensure the safety of faculty, students, researchers and staff who may work within a University machine shop. This policy is applicable to any shop that possesses machinery including, but not limited to:

- Machine Shops
- Carpentry Shops
- Other shops that use machinery for the purpose of fabrication (i.e. plastics, glass, ceramics etc.)

HARVARD SCHOOL/DEPARTMENTS

Consistent with University EH&S policy, each Harvard School/Department that operates a machine shop is responsible for its safe and compliant operation and shall ensure for the implementation of these safe work practices. It is the responsibility of every shop supervisor to comply with the operating practices listed in this document and to ensure a safe working environment that complies with OSHA and other applicable regulatory standards.

Each Harvard School/Department shall be responsible for:

- Designating a qualified Shop Supervisor to implement the safety measures of the Machine Shop Safe Work Practices for each shop. Shop Supervisor responsibilities are further clarified in the body of this document.
- Maintaining an inventory of Machine Shops, woodworking, or department fabrication equipment. Annually update information on operational shops, such as, equipment inventories, designated shop supervisors, etc. and provide this information to EH&S.
- Ensure that safe work practices are monitored and audited by Shop Supervisor and their management to ensure for ongoing safety in school/department shops.

ENVIRONMENTAL HEALTH & SAFETY

The Environmental Health & Safety (EH&S) Department provides technical support to shops by conducting annual assessments of University machine shops; monitoring and communicating proposed safety standards/regulations; assisting in the assessment of machine shop equipment; and investigating suspected unsafe conditions or accidents. EH&S provides technical resources and tools on its website specific to safe machine shop practices and annually communicates this policy to schools and departments along with any additional information pertinent to the safe operation of Harvard's machine shops.

MACHINE SHOP SAFE WORK PRACTICES:

Machine Shop Safe Work Practices that ensure safe operation include:

- Designated Shop Supervisors
- Controlled Access To Shops and Equipment
- Training and Authorizations For Use
- Shop Specific Operating Rules



- Standard Operating Procedures For Equipment
- Documented Auditing and Inspections

Designated Shop Supervisors

School/department must ensure that each shop has a designated and “qualified”* Shop Supervisor(s) to implement these safe work practices. Shop Supervisor(s) must be experienced and competent in the safe use of all tools and machinery in the shop.

* OSHA defines “Qualified” as - one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training and experience, has successfully demonstrated his ability to solve or resolve problems relating to the subject matter, the work, or the project.

It is the responsibility of the Shop Supervisor to maintain and document the key elements of a Shop Safety Plan, including, but not limited to:

- Contact information for the facility manager and shop supervisor
- A copy of the shop’s policies and procedures
- An inventory of machinery in the shop
- Copies of standard operating procedures
- A documented self-inspection process
- A list of personnel authorized to use the shop
- A copy of the personnel protective equipment assessment
- Documented training program and records

Documentation must be readily available and made available for an internal or external regulatory agency inspection.

A machine shop safety plan template along with guidance on the use of personal protective equipment, machine guarding, recommended safe use of equipment (SOP’s) and external references are available on the EH&S web site: <http://www.ehs.harvard.edu/programs/machine-shop-safety>

Controlled Access to Shops and Equipment

The Shop must develop a method for controlling the access of unauthorized personnel. At a minimum, each shop must implement a means to prevent the unauthorized use of dangerous machinery and tools, such as, locking out machinery or ID card access controls, etc.

Working Alone in Shop

The practice of working alone in a machine shop can, in many situations, present significant risks and should be avoided and/or prohibited, whenever possible. The practice should only be allowed after a careful risk-based determination by each school/department along with shop supervisors. Factors to consider include the experience of personnel accessing the shop to work alone, the type of work/operations to be performed and equipment utilized along with other shop specific circumstances.

Training and Authorizations for Use

Shop users must complete training commensurate with their use of the machine shop that ensures for the safe and proficient use of equipment/machines. The training sessions will be provided or coordinated by the Shop Supervisor.



The training must include, at a minimum, the following topics:

- Review of this Machine Shop Safety Policy and the shop specific operating rules
- Dangers associated with specific tools, machinery in that shop
- Personal protective requirements
- Safe use
- Hazards and limitations
- Guard placement and adjustments
- Cleaning and maintenance
- Equipment use demonstration

The Shop Supervisor periodically observes operators and conducts refresher training as need, and/or when a process or equipment changes. Training records of personnel must be maintained by the shop. A training record form template that can be easily edited is available on the EH&S machine shop website: <http://www.ehs.harvard.edu/programs/machine-shop-safety>

Shop Specific Operating Rules

Each shop must develop its own specific operating rules, in writing. At a minimum, these rules must address the following information:

- Notice that communicates only authorized users allowed
- Hours of operations
- Personal protective equipment requirements
- Operating attire (i.e. tie back long hair, roll back sleeves, etc.)
- Safe shop practices (i.e. working alone, safe behavior, etc.)
- Safe use for equipment and tools
- General rules for housekeeping and safety
- Training requirements
- First aid and eye washing
- Contact information (shop supervisor and facility manager)
- Emergency contact information
- Enforcement of shop policies and procedures

Standard Operating Procedures for Equipment

Standard Operating Procedures (SOP's) must be maintained for each piece of machinery in the shop. SOP's must be based on the recommendations of the manufacturer and should list the specific hazards associated with the machine, as well as, recommendations for safe use. SOP's must be available at or near the machine and copies be kept in the *Shop Safety Plan*.

Documented Auditing and Inspections

The Shop Supervisor is responsible for conducting and documenting (inspection) periodic machine, tool, associated equipment, and shop safety inspections. A self-inspection form template that can be easily edited is available on the EH&S machine shop website: <http://www.ehs.harvard.edu/programs/machine-shop-safety>

All machine tools and equipment that are deemed unsafe must be removed from service and locked out until properly repaired.