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EHS-319 HAND AND PORTABLE POWERED TOOLS PROGRAM

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EHS-319 HAND AND PORTABLE POWERED TOOLS PROGRAM

1.0 Introduction

1.1 Purpose

The purpose of this program is to provide guidance in the protection of all Emory employees, students, visitors, contractors, and others from workplace hazards associated with the use of hand and portable powered tools as prescribed in the Occupational Safety and Health Administration (OSHA) Standard - [29 CFR 1910.241 Hand and Portable Powered Tools and Other Hand-Held Equipment](#). While some entities and/or divisions of Emory may have additional or more stringent guidelines, the guidelines outlined in this document shall serve as the minimum requirements for all.

1.2 Scope

This program is inclusive of Emory employees, including Emory Healthcare (EHC), faculty, staff, students, contractors, and other people who work with or in close proximity to hand and portable powered tools. This includes explosive-actuated fastening tools, such as hammer-operated piston tools, high and low velocity tools, fastening devices, hand tools, portable abrasive wheels, portable power tools, pneumatic power tools, jacks, power lawnmowers, and abrasive blast cleaning nozzles.

1.3 Definitions

EHSO. Environmental Health and Safety Office.

Hammer-operated piston tool. A tool which, by means of a heavy mass hammer supplemented by a load, moves a piston designed to drive a stud, pin or fastener into a work surface.

High-velocity tool. A tool or machine which, when used with a load, propels or discharges a stud, pin or fastener at velocities in excess of 300 feet per second for the purpose of impinging it upon, affixing it to or penetrating another object or material.

Low-velocity piston tool. A tool that utilizes a piston designed to be captive to drive a stud, pin or fastener into a work surface at less than 300 feet per second.

Stud, pin or fastener. A fastening device specifically designed and manufactured for use in explosive-actuated fastening tools.

Portable grinding. A grinding operation where the grinding machine is designed to be hand held and may be easily moved from one location to another.

Jack. An appliance for lifting and lowering or moving a load horizontally by application of a pushing force. Jacks may be of the following types: lever and ratchet; screw and hydraulic.

Rating. The rating of a jack is the maximum working load for which it is designed to safely lift.

1.4 Responsibilities

Environmental Health and Safety Office (EHSO)

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As the administrative department for the Hand and Portable Powered Tools Program, EHSO and EHC Safety Management are responsible for the following:

- Development, implementation, and administration of the Hand and Portable Powered Tools Program in their areas;
- Assisting supervisors with development of specific safety procedures as needed;
- Reviewing, updating, and evaluating the overall effectiveness of the Hand and Portable Powered Tools Program.
- Ensuring that Hand and Portable Powered Tools training is provided to all Emory or EHC employees who work with this equipment.

Directors, Supervisors, and Managers

Directors, supervisors, and managers have primary responsibility for the management and enforcement of the Hand and Portable Powered Tools Program in their areas. They must:

- Ensure that all affected personnel are trained;
- Develop safety procedures, with the assistance of the EHSO and/or EHC Safety Management, for the use of hand and portable powered tools in their areas.

Employees

All employees are responsible for the following:

- Comply with the rules set forth by this program.
- Successfully complete all required training.

1.5 Training Requirements

- Only trained personnel are permitted to use hand and portable powered tools.
- It is the responsibility of supervisors to ensure their employees are trained.
- Training must be specific to the type of tool(s) being used.
- At a minimum, the training must cover the following:
 - The requirements of 29 CFR 1910.241;
 - Manufacturer's requirements;
 - Recognizing and avoiding electrical hazards;
 - Recognizing and avoiding unsafe conditions in the work setting;
 - Instructions for correct operation of the tool(s);
 - Proper use of personal protective equipment (PPE);
 - Hands-on operation of the tool(s).
- Training shall be given upon initial assignment and every three years thereafter or whenever a new employee is introduced into a work area, whichever is sooner.
- Training will be conducted by EHSO or EHC Safety Management.
- Documentation of completion will include the employee's name and department, as well as a signature for courses conducted in a classroom setting.

1.6 Recordkeeping Requirements

Any entity or division that provides training is responsible for maintaining records of their training. Training records for training provided by EHSO are retained by EHSO and available through EHSO.

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1.7 Program Evaluation

The written Hand and Portable Powered Tools program shall be re-evaluated annually and revised if necessary.

2.0 Personal Protective Equipment (PPE)

When operating portable powered tools, always wear the appropriate personal protective equipment, including the following:

- Eye protection – safety glasses (with side shields when working with tools that create flying particles)
- Foot protection – steel-toed work boots or shoes
- Hand protection – work gloves (with anti-vibration attributes, when needed)
- Respiratory protection – when working with sanders, grinders, or any other tool that creates excessive dust, a respirator (including N95 or N99 respirators) may be necessary when engineering controls do not reduce dust exposure to acceptable levels.
 - Respirators must also be worn while engineering controls are being installed.
 - The use of a respirator is subject to prior review by EHSO and/or EHC Safety Management, since their use is regulated by the Occupational Safety and Health Administration's (OSHA's) Respiratory Protection Standard. Any worker who believes that respiratory protection is needed must notify EHSO and/or EHC Safety Management to conduct a hazard assessment.
 - For additional information, refer to the Respirator Protection Program located on the EHSO website (www.ehso.emory.edu).
- Hearing protection – when working with tools that create excessive noise or in noisy areas. Emory University employees contact EHSO at (404) 727-5922 or email indhyg@emory.edu to schedule noise monitoring. EHC employees contact EHC Safety Management for assistance.
- Any other PPE deemed necessary by the supervisor, EHSO, or EHC Safety Management for the area and work conditions.

3.0 General Requirements

- Examine tools for any signs of wear or damage before use. Any tools with defective, damaged, or compromised parts, guards, or ancillary parts must be removed from service.
- Operate tools according to the manufacturer's recommendations.
- Only use compressed air for cleaning purposes when the pressure is reduced to less than 30 psi, when effective chip guarding is in place, and while wearing proper PPE.
- Use the correct tool for the corresponding task.
- Never carry tools by the cord or hose.
- When working in a wet environment, only use tools with a ground fault circuit interrupter (GFCI).
- Keep cords and hoses away from heat, oil, sharp edges, and moving parts.
- Keep cords tidy and organized to avoid creating a trip hazard.
- Replace frayed and/or damaged cords. Do not attempt to repair damaged cords

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with electrical tape, duct tape, etc.

- Remove damaged tools from service and tag with an appropriate accident prevention or status tag, such as “Danger” or “Out of Service”.
- Disconnect electrical tools when not in use, before servicing, and when changing accessories such as blades, bits, and cutters.
- Avoid wearing loose-fitting clothing and jewelry, and tie back long hair.
- Direct saw blades, knives, and other tools away from other employees working in the area.
- Store sharp-edged tools in such a way as to prevent injuries when not in use.

4.0 Hand Tools

Hand tools are non-powered tools, such as hammers, axes and wrenches. The greatest hazards posed by hand tools result from misuse and improper maintenance.

- Always use sharpened tools and cut away from your body.
- Use spark-resistant tools made from brass, plastic, aluminum or wood when working around flammable substances.

5.0 Portable Powered Tools

5.1 Guarding

- Ensure that hazardous moving parts of portable powered tools, such as belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating parts are guarded prior to using.
- Ensure the guards protect the operator and others from the point of operation, nip points, rotating parts, flying chips, and sparks.
- Never operate a power tool if its guard is not in place.

5.2 Safety Switches

- The following hand-held tools must be equipped with a momentary contact “on-off” control switch. They may also be equipped with a lock-on control provided so that the tool can be turned off by a single motion of the same finger(s) that turned it on.
 - Drills.
 - Tappers.
 - Fastener drivers.
 - Horizontal, vertical, and angle grinders with wheels larger than two inches in diameter.
 - Disc sanders with discs greater than two inches in diameter.
 - Belt sanders.
 - Reciprocating saws.
 - Saber saws.
 - Jigsaws with blade shanks greater than ¼ inch.
 - Other similar tools to the above listed.
- The following hand-held tools may be equipped with only a positive “on-off” control switch:
 - Platen sanders.
 - Disc sanders with discs two inches or less in diameter.
 - Grinders with wheels two inches or less in diameter.

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- Routers.
- Planers.
- Laminate trimmers.
- Nibblers.
- Shears.
- Scroll saws.
- Jigsaws with blade shanks ¼ inch wide or less.
- Ensure that chain saws, other hand-held tools such as circular saws with a blade diameter greater than two inches, and percussion tools without positive accessory holding means are equipped with a constant pressure switch that will shut off the power when pressure is released.
- Ensure that all hand-held gasoline powered chain saws are equipped with a constant pressure throttle control that will shut off the power to the chain saw when the pressure is released.

6.0 Electric Tools

- To protect from electric shock, ensure that electric tools have a grounded three-wire cord, double insulation, or are powered by a low-voltage isolation transformer.
- If using an adaptor to accommodate a two-hole receptacle, attach the adaptor wire to a known ground.
- Never remove the third prong/ground prong from the plug.
- Always use electrical tools within their design limitations.
- Disconnect electrical tools when not in use, before servicing, and when changing accessories such as blades, bits, and cutters.
- When not in use, store tools in a dry, non-corrosive environment.
- Only use electrical tools in well-lit settings.

7.0 Portable Abrasive Wheel Tools

Portable abrasive wheel tools include such tools as grinding, cutting, polishing and wire buffing wheels.

- Before use, visually inspect the abrasive wheel and perform a sound or ring test to ensure it is free from cracks or defects.
- To perform a ring test, tap the wheel gently with a light non-metallic instrument.
- An undamaged wheel will give a clear metallic tone.
- To prevent the wheels from cracking, ensure the wheel fits freely on the spindle.
- Ensure that the maximum RPM rating of the abrasive wheel does not exceed the RPM rating of the grinder motor.
- Ensure that the spindle speed does not exceed the maximum operating speed marked on the wheel.
- Due to the possibility of a wheel disintegrating, do not stand directly in front of the wheel as it accelerates to full operating speed.
- Never clamp a hand-held grinder in a vise.

8.0 Explosive-Actuated Fastening Tools

Explosive actuated fastening tools operate like a loaded gun and may be operated only by specially trained personnel. These include hammer-operated, low-velocity and high-

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velocity piston tools.

- Do not use these tools in an explosive or flammable atmosphere.
- Before use, inspect the tool to ensure it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.
- Only load the tool if it will be used immediately. Never leave a loaded tool unattended.
- Keep hands clear from the barrel end.
- To prevent accidental firing, two separate motions are required for firing, one to bring the tool into position and another to pull the trigger.
- The tool must not operate until pressed against the work surface with a force of at least 5 pounds greater than the total weight of the tool.
- If a tool misfires, allow 30 seconds to pass before trying to fire it again. If a second attempt also misfires, wait another 30 seconds, then remove the faulty cartridge in accordance with the manufacturer's instructions and place it in water.
- Ensure the explosive-actuated fastening tool is designed so that it will not fire unless it has a guard in place.
- Ensure the tools are designed for varying powder charges so the operator can select the appropriate powder level for the task and avoid excessive force.
- Immediately tag and remove any damaged tool from service until it is properly repaired.
- When applying fasteners, use an alignment guide.
- Do not fire the fastener into material that would allow it to pass all the way through.
- Do not drive fasteners into very hard or brittle material which might chip, splatter, or make the fastener ricochet.

9.0 Hydraulic Power Tools

- Ensure the fluid used in hydraulic tools is an approved fire-resistant fluid and that it retains its operating characteristics at the most extreme temperatures to which it will be exposed.
- Do not exceed the manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings.
- Ensure that all hydraulic tools, including jacks, subjected to freezing temperatures are filled with adequate antifreeze liquid.

10.0 Jacks

Jacks covered by this section include lever and ratchet jacks, screw jacks and hydraulic jacks.

- Ensure all jacks have a device that stops them from being jacked up too high.
- Inspect all jacks before each use and lubricate regularly.
- Ensure that the manufacturer's load limit is permanently marked in a prominent place on the jack. Do not exceed the load limit.
- After the load has been raised, it must be cribbed, blocked, or otherwise secured at once. Do not use a jack to support a lifted load.
- Wooden blocking may be used if necessary to make a jack level and secure.
- If the lift surface is metal, place a one inch thick hardwood block or equivalent

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- between the surface and the metal jack head to reduce the danger of slippage.
- When setting up a jack:
 - Rest the base on a firm level surface.
 - Correctly center the jack.
 - Ensure the jack head is against a level surface.
 - Ensure the lift force is applied evenly.

11.0 Power Lawnmowers

Lawnmowers covered by this section include walk-behind, riding rotary and reel power lawnmowers.

- Power lawnmowers must be guarded in accordance with machine guarding requirements in OSHA standard 29 CFR 1910.212 and Emory University's Machinery and Machine Guarding Program.
- All power-driven chains, belts, and gears must be positioned or guarded so as to prevent accidental contact during normal starting, mounting, and operation of the machine.
- Lawnmowers must be equipped with a shutoff device to stop operation of the motor or engine. This device shall require manual and intentional reactivation to restart the motor or engine.
- Guards and catcher assemblies must be shipped and sold as part of the mower.
- If a guard is removed in order to install a catcher assembly, it must be stated in the instruction manual and in warning instructions affixed on the mower that the mower cannot be used without the catcher assembly or guard in place.
- The blade must be fully enclosed except on the bottom. The enclosure must extend to or below the lowest cutting point of the blade while it is in its lowest position.
- A warning label, such as "Caution", must be placed on the mower at or near each discharge opening.
- Openings in the blade enclosure must be secured with a bar which can only be removed with the use of tools.
- Walk-behind rotary mowers
 - The opening in the blade enclosure for grass discharge must not contact the operator area.
 - The mower handle must be fastened to the mower so that unintentional uncoupling during operation prevents loss of control.
- Riding rotary mowers
 - Openings must be placed so that grass or debris will not discharge toward the seated operator.
 - Mowers shall be provided with stops to prevent jackknifing or locking of the steering mechanism.
 - Hand-operated wheel drive disengaging controls shall move opposite to the direction of vehicle motion in order to disengage the drive. Foot-operated wheel drive disengaging controls shall be depressed to disengage the drive.



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12.0 References

- OSHA Standard - [Hand and Portable Powered Tools and Other Hand-Held Equipment \(29 CFR Subpart P\)](#)
- [Emory University Machinery and Machine Guarding Program](#)
- [Emory University Respiratory Protection Program](#)