

Shop Safety Procedure

	Equipment/Task Name:	METAL SHEARS
	Equipment/Task Hazard Class:	5 – POWERED SHEARS 2 – MANUAL SHEARS http://ehs.yale.edu/forms-tools/tool-classification-matrix
	Shop Name:	
	Shop Hazard Class:	

Purpose

Metal shears are typically used to make straight cuts in flat sheet metal stock. Metal shears may be bench mounted or have integral stands and can be manually powered or electrically, hydraulically, and/or pneumatically powered. For the purpose of this Procedure, the term “shear” will be used to refer to manual and powered metal shears unless specifically stated.

Hazards

As with all shop tools there are many potential hazards associated with the use of a shear. Powered shears are Class 5 tools while manual shears are Class 2 tools (<http://ehs.yale.edu/forms-tools/tool-classification-matrix>). There are a number of particular hazards associated with the operation and use of shears (See attached diagram).

- **Amputation** – The shear blade can easily amputate body parts if proper safe guards and procedures are not used.
- **Flying Objects** – Cutting activities can generate sharp flying chips. Work pieces can become disengaged and be flung across the room. This is especially true for cutoffs on the exit side of the shear.
- **Cuts, Laceration, and Puncture** – Sharp edges on tooling, sharp edges and potential burrs on the work piece are created when using this tool.
- **Pinch Points** – Potential pinch points exist with hold down clamps, moving shear parts, and between the workpiece and the tool. Familiarity of all potential pinch points, appropriate guarding, and proper tool use will prevent accidental contact with pinch points.

Limitations

- Manual shears typically allow for cutting mild steel sheets less than 1/8” in thickness with width limited to the width of the shear blade. Refer to the equipment manufacturer’s instructions or contact the Shop Supervisor for appropriateness of material.
- Shears are designed to cut sheet metal stock only. Cutting material other than sheet metal, such as round stock, will damage the shear blade.

Required Personal Protective Equipment

- Refer to the Shop Safety Postings and instructions provided by the Shop Supervisor.
- Shop specific required PPE:

Required Training

- Applicable Shop Rules
 - **Student Shop Rules** (<http://ehs.yale.edu/forms-tools/shop-rules-student-accessible-shops>)
 - **Professional Shop Rules** (<http://ehs.yale.edu/forms-tools/guidelines-professional-shops>)
- For Class 2 through 5 Student Shops, review and signing of the **Yale University Shop/Tool Use Safety Agreement** (<http://ehs.yale.edu/forms-tools/shoptool-use-safety-agreement>).
- Shop Supervisors or Instructors must evaluate the tool user based on successful demonstration of the Training Competencies listed below as applicable.

Training Competencies:

- Understand the uses, limitation, and hazards of shears.
- Be able to dress appropriately and don correct personal protective equipment.
- Know how to inspect the shear and ensure all components function properly for the selected option.
- Show proper body position for stable operation of the shear.
- Demonstrate good judgment in the shearing process.
- Know how to recognize proper operation and engagement of clamps and guards.
- Be capable of effectively and safely performing the shearing operation.
- Be able to correctly locate, mark, position, and shear a workpiece to the desired size.

Shop specific training requirements:

Authorized Tool Users

Shop Supervisor, Shop Monitors and those authorized by shop supervision to operate the tool.

Tool Safety Rules

- Observe and follow all Yale Professional or Student Shop Rules as posted.
- Understand and follow manufacturer operating procedures.
- Inspect the tool for damage prior to use.
- Verify all guards are in place and adjusted properly.
- Do not bypass any safety devices.
- Always stay at the machine while it is running.
- Clean the tool after use.
- Report any malfunction or damage to the Shop Supervisor after tagging the tool “Out of Service, do not use”.
- Always keep fingers clear of the blade.
- For foot operated manual shears, keep the foot that is not being used out from under the treadle.
- Never exceed the capacity of the tool. For hand operated manual shears, never attempt to exceed the capacity by using an extension bar on the handle to increase leverage. Similarly, for foot operated manual shears, never attempt to exceed the capacity by jumping on or placing both feet on the treadle.
- Never attempt to shear multiple workpieces at a time.
- If a two-person operation is required, communication and responsibilities must be clear and defined. The helper must give the signal to the operator to cycle the shear. The operator must know the helper’s position at all times and give a “clear” signal before bringing the blade down.
- Never feed material from the backside of the shear.

Tool Safety Rules (cont'd)

- Never feed material from the backside of the shear.
- Only wear protective gloves when handling sheet metal with manual shears with no powered feed.
- Place scraps and trimmings in metal waste containers.

Shop specific rules:

Proper Setup and Use

Prior to Use:

- Verify the workpiece is safe and appropriate for use on the particular metal shear.
- Identify the cutting location on the workpiece and mark it.
- Prepare for shearing by verifying that any loose clothing or jewelry has been removed or secured, and hair (including beards) is tied back.
- Don personal protective equipment.

At the Shear:

- With the tool secured in the off position, adjust the shear guard so that it is set as low as possible, allowing only enough clearance for the workpiece.
- Ensure that no one is behind the shear where cut metal could be ejected.
- Inspect the tool and the surroundings for hazards, equipment damage, or missing guards.
- For powered shears, turn on the shear and operate it through a test cycle to verify functionality.
- Insert workpiece into the shear, align with the side table guide, and slide the workpiece until the cut line is aligned with the shear blade.
- While holding the workpiece, ensure hands are clear of any pinch points (including between the workpiece and the shear table), engage the hold-down clamp if applicable. For manual shears, this typically happens during the first part of travel of the actuator lever or treadle.

Shearing Process:

- Engage the shear completely to complete one full cycle. For hand operated manual shears use both hands to engage the lever from a stable position such that no body parts are positioned between the lever and the shear table. For foot operated manual shears use one foot to actuate the treadle with the other foot stable on the floor.
- Maintain control of the lever or treadle after the cut is complete and slowly return the actuators to the neutral/starting position.
- Be aware that the workpiece will no longer be secured by the hold-down clamp once the tool returned to the starting position.
- Slide the workpiece out of the shear while being careful of sheared and sharp edge.
- Carefully remove the cutoff from the shear if it has not already dropped into a scrap bin.

Completion:

- Ensure all scraps/cutoffs are clear of the shear table, blade and hold-down clamp.
- Ensure the actuator has returned to the starting position and is secure when released.

Shop specific procedures:

Diagrams/Illustrations

Typical Foot Operated Manual Shear



- HOLD DOWN AND GUARD
- SHEAR TABLE
- EXTENSION ARMS
- TREADLE

Example Powered Shear



- HOLD DOWN AND GUARD
- SHEAR TABLE
- SHEAR FOOT SWITCH

Creation/Revision Dates:

Suggestions, questions, or comments? Please contact your shop supervisor or EHS.