



# Safety Instruction

## Shop Caution Sign

### GENERAL

A standardized caution sign has been established at OSU; its purpose is to warn employees and visitors entering laboratories, shops, field stations, and other areas of the potential hazards therein.

A sign is **required** at each main entrance to:

- Shops,
- Laboratory rooms or complexes,
- Teaching labs, and
- Workrooms with materials not commonly found in an office environment.

A sign is **not required** in:

- Offices,
- Rest rooms,
- General purpose classrooms, or
- Break rooms/food prep areas (not including Food Science-related research activities).

### SIGN REQUEST

Signs are generated by EH&S. However, personnel responsible for the hazardous area (i.e. Shop and Lab Managers) are responsible for providing EH&S with current and accurate information via the ONID accessed [Shop Caution Sign Request](#) website.

### SHOPS DEFINED

There are many shops on the main campus and at research and field stations that conduct work in support of research and maintenance activities. A shop is any area that has equipment, processes, or activities of an industrial nature, such as:

- **Materials Handling** with equipment such as a forklift, crane, powered pallet jack, or powered platform.
- **Metal Working** such as milling, cutting, drilling, sawing, turning, threading, forming, and grinding.
- **Hot Work** such as welding, burning, brazing, soldering, cutting, grinding, casting, forging, and heat-treating.
- **Carpentry and Woodworking** such as cutting, drilling, turning, planing, routing, sanding, gluing, bonding, and fastening.
- **Electrical / Electronic Work** such as manufacture or repair of circuits, wiring, control systems and related equipment.
- **Equipment Development** including machine and model prototyping, building, repair, and maintenance.
- **Plastics Work** such as machining, bending, burning, bonding, cutting, drilling, gluing, melting, and forming.
- **Surface Modification** such as sandblasting, rock and mineral sample preparation, painting, surface preparation, laminating, burning, etching, and masking.
- **Glass Work** such as blowing, annealing, tempering, bonding, grinding, drilling, and glazing.
- **Process Development** such as using extruders, high pressure or temperature systems.

Department
Building / Room

# CAUTION

Entrance Requirements			Work Requirements		
AUTHORIZED ENTRY ONLY	NO FOOD OR DRINK	CLOSED-TOE FOOTWEAR	ID BADGE	HAIR / JEWELRY / CLOTHING SECURE	
Special:					
			EYE & HEARING PROTECTION	HEAD PROTECTION	
Name	Office	Phone 1	Phone 2		
Shop Manager					
Other Contact					
Dept. Office					

EH&S: 737-2273
Campus Security: 737-7000
Fire - Police - Ambulance: 911
Effective: dd month yyyy

NOTE: This is only a sample. Shop Caution Sign icons and information are inherently dependent upon the space they represent.

**Contact EHS:**  
[www.ehs.oregonstate.edu](http://www.ehs.oregonstate.edu)  
[ehs@oregonstate.edu](mailto:ehs@oregonstate.edu)  
 541 • 737 • 2273

## ICON DESCRIPTIONS

### Entry Requirements



AUTHORIZED  
PERSONNEL ONLY

#### Authorized Entry Only

- Access to the room restricted.
- Limitations and considerations are determined by the shop manager.
- Does not apply to EH&S, Facilities Services, or custodial personnel performing necessary safety-related, maintenance, or contracted activities.



NO FOOD OR  
DRINK

#### No Food or Drink

- It is a best practice to not allow food or drink in areas where a chemical or biological hazard exists.
- Limitations and considerations are determined by the shop manager.



NO OPEN TOE OR  
OPEN HEEL SHOES

#### Closed – Toe Footwear

- [Appropriate footwear shall be worn at all times.](#) In some instances, the shop manager may require workers to wear steel-toed or other protective shoes.
- Required in all shops and added to each Cation Sign by default.

### Work Requirements



ID BADGE  
REQUIRED

#### ID Badge

- Access to the room restricted.
- Limitations and considerations are determined by the shop manager.
- Does not apply to EH&S, Facilities Services, or custodial personnel performing necessary safety-related, maintenance, or contracted activities.



HEAD  
PROTECTION

#### Head Protection

- [Required in those spaces with potential for injury to the head](#) from falling or flying objects or contact with exposed electrical conductors.
- Type of protection required determined by the shop manager.



EYE  
PROTECTION

#### Eye and Face Protection

- [Appropriate personal protective equipment](#) required when exposed to eye or face hazards from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or potentially injurious light radiation.
- Type of protection required determined by the shop manager.



FACE SHIELD



HEARING  
PROTECTION

#### Hearing Protection

- Required when workers are exposed to excessive noise levels [exceeding a TWA of 85 dBA.](#)
- If you must raise your voice or shout to be heard above the noise in the workplace, this rule may apply.



HAIR / JEWELRY /  
CLOTHING SECURE

### Hair / Jewelry / Clothing Secure

- Severe injuries and death can occur from being caught in or struck by rotating parts.
- An operator can be pulled into the equipment (e.g. lathe, mill, grinder, sander) from working dangerously close or wearing gloves, loose clothing, loose hair, jewelry, etc.
- Required as determined by the shop manager.

## Physical Hazards



HOT WORK AREA

### Hot Work

- Satisfies the OSU Hot Work Safety Program signage requirement for a permanent hot work permit.
- Required for normal or periodic shop operations involving brazing, burning, cutting, grinding, sawing, soldering, welding, or any other similar or related activity that produces flames, sparks, heat, or is otherwise capable of initiating fires or explosions.



FORKLIFT TRAFFIC

### Forklift Traffic

- Required whenever the shop area houses or routinely operates a forklift.
- It is a best practice to use this icon if your shop area is subject to periodic forklift traffic from other university personnel beyond your supervision or control.



OVERHEAD CRANE

### Overhead Crane

- Required whenever the shop area houses a fixed position hoist, or bridge, monorail, gantry, jib, or other crane that can present overhead hazards.
- Not required for cranes less than 6 feet tall, such as an engine hoist.



PINCH POINTS

### Pinch Points

- Severe crushing injuries, avulsions, or amputations can occur if an operator makes contact with moving parts, pinch and shear points from a wide variety of machinery.
- Required as determined by the shop manager.



CUTTING SURFACES

### Cutting Surfaces

- Severe cuts, avulsions, and amputations can occur if an operator makes contact with rotating, reciprocating, or stationary blades from a wide variety of machinery.
- Required as determined by the shop manager.



SHOCK HAZARD

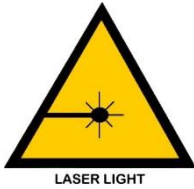
### Shock Hazard

- Working with electricity, including wiring, cabling, and circuit assemblies can be dangerous.
- Even when properly grounded, electrical equipment can instantly change from safe to hazardous because of extreme conditions or rough treatment.
- It is not necessarily the number of volts that will electrocute you, but the amount of current, its path, and the time it takes to pass through your body.
- Falls, burns, major damage to internal organs, and even death can occur.
- Required as determined by the shop manager.



### Ultraviolet (UV) Light

- Area contains a machine that **produces any amount** of UV light.
- UV light can cause cellular damage such as burns, skin cancer, and loss of vision.



### Laser

- Area contains a Class 3B or Class 4 laser.
- Some Class 3B and all Class 4 open beam lasers require additional signage. Notify the OSU Laser Safety Officer.

## Common Shop Chemical Hazards



### Flammable Gases

- Area contains **100 cubic feet or more** of a flammable gas in one or more containers.
- Flammable gases have a flash point below 100 °F (37.8 °C).
- Examples include Acetylene and liquefied petroleum gas (LPG).



### Oxidizing Materials

- Area contains **150 cubic feet or more** of an oxidizing compressed gas.
  - Examples include Oxygen and Oxides of Nitrogen.
- **1 pound or more** of a [Class 3 Oxidizer](#).
- **25 pounds or more** of a [Class 2 Oxidizer](#).



### Inert Gases

- Area contains **100 cubic feet or more** of an inert gas in one or more containers.
  - Examples include Argon, Helium, and Nitrogen.
- Inert gases are not toxic and do not burn or explode. Yet they can cause injury or death, if present in sufficiently high concentrations, by displacing enough oxygen to induce asphyxiation.



### Flammable Liquids

- Area contains **1 gallon or more** of flammable liquids in one or more containers.
  - Examples include Acetone, Methanol, and gasoline.
- Defined as any liquid with a flash point below 100 °F (37.8 °C).
- Areas containing **10 gallons or more** require flammable cabinet storage.

## Uncommon Shop Chemical Hazards (more typical of labs)



### Corrosive Materials

- Area contains **50 gallons (liquid) or 500 pounds (solid) or more** of corrosive materials in one or more containers.
  - Examples include Sulfuric, Nitric and Hydrochloric acids; Sodium, Potassium and Calcium hydroxides.
- Defined as a substance with  $2 \leq \text{pH} \leq 12.5$ .



### Toxic Materials

- Area contains **1 pound or more** of highly toxic chemicals in one or more containers.
- Convert liquid chemicals to pounds for this calculation.
- Defined as any solid or liquid with an:
  - oral LD<sub>50</sub> ≤ 50 mg/kg, or
  - dermal LD<sub>50</sub> ≤ 200 mg/kg.



### Toxic Gas

- Area contains **any amount of highly toxic gases** in one or more containers.
- Defined as any gas with an inhalation LC<sub>50</sub> ≤ 200 ppm (2 mg/L)
  - Examples include: Fluorine, Hydrogen cyanide, Nitric oxide, Nitrogen dioxide, Phosgene.
- Area contains **80 cubic feet or more of toxic gases** in one or more containers.
- Defined as any gas with an inhalation LC<sub>50</sub> 200–2000 ppm (2–20 mg/L).
  - Examples include Chlorine, Hydrogen chloride, Hydrogen sulfide, and Ozone.



### Cancer Suspect Agents

- Area contains **any amount of High or Extreme Hazard Carcinogens** as described by the OSU [Carcinogen Safety Program](#).



### Cryogenics

- Area contains **4 liters or more** of cryogenic liquids.
- Common cryogenic liquids are industrial gases that have been condensed under extremely high pressures and low temperatures and have boiling points below -238°F (-150°C).
  - Examples include nitrogen, argon and petroleum gas (LPG).



### Unbound Engineered Nanoparticles

- Area contains unbound (not affixed to a surface or imbedded in a matrix) engineered nanoparticles (UNP).
- UNP may pose occupational health risks by means of inhalation, ingestion or dermal exposure.
- Defined as an ultrafine particle with lengths in two or three dimensions between 1 and about 100 nanometers (nm) and which may or may not exhibit a size-related intensive property.

## Waste



### Used Oil

- Petroleum or synthetic based oil used for cooling or lubrication and **suitable for recycling**.
- Classic example: used oil drained from an engine.
- Other examples include used gear oil and hydraulic fluid.



### Waste Oil

- Oil that is **not suitable for recycling** and must be disposed of as hazardous waste.
- Classic example: engine oil contaminated with significant amounts of water, anti-freeze, or solvents.
- Oil containing halogens (commonly used in transformers, vacuum pumps, and refrigeration units) is not suitable for recycling and must be considered waste oil.