

## 6.0 Storage and Handling of Hazardous Materials

The use and storage of hazardous materials is regulated by the Michigan Right to Know Law, also called the Hazard Communication Standard. The Right to Know Law affects nearly every employee at MTU because it applies to the use of all chemicals or products that have a documented safety or health hazard. Such substances include toners and cleaners used in office environments, janitorial supplies, lubricants, welding electrodes and gases, metal stock, etc. The MIOSHA Laboratory Standard supercedes the Right to Know Law in chemical laboratories.

### 6.1 The University Hazard Communication Plan

The University Hazard Communication Plan requires containers to be properly labeled and Material Safety Data Sheets to be maintained in an organized collection and available at all times to employees in each work area. It also requires each employee to be trained in the interpretation of Material Safety Data Sheets, the protective measures to be taken, the symptoms of exposure and other information related to the substances they use. Each person who supervises students or employees exposed to substances regulated by the MIOSHA Hazard Communication Standard must be familiar with the University Hazard Communication Plan and comply with its requirements.

### 6.2 Flammable Liquids Outside of Laboratories

Storage of flammable liquids in buildings shall be limited to that required for the operation of office equipment, maintenance, and classroom demonstrations in addition to the following restrictions:

- ▶ Containers of Class IA liquids shall not exceed one pint capacity for glass containers, one gallon capacity for metal, or two gallons capacity for safety cans.
- ▶ Containers of Class IB liquids shall not exceed one quart capacity for glass containers, one gallon capacity for metal, or two gallons capacity for safety cans.
- ▶ Containers of Class IC liquids shall not exceed one gallon capacity for glass containers, one gallon capacity for metal, or two gallons capacity for safety cans.
- ▶ Containers of combustible liquids shall not exceed one gallon capacity for glass containers, or five gallons capacity for metal containers and safety cans.
- ▶ Not more than ten gallons (or 25 gallons in safety cans) of Class I and combustible liquids combined shall be stored in a single fire area outside of a UL listed or FM approved storage cabinet or an inside flammable liquids storage area.

**Definitions:**

Class IA flammable liquid - a liquid having a flash point below 73 F (22.8 C) and having a boiling point below 100 F (37.7 C).

Class IB flammable liquid - a liquid having a flash point below 73 F (22.8 C) and having a boiling point at or above 100 F (37.7 C).

Class IC flammable liquid - a liquid having a flash point at or above 73 F (22.8 C) and below 100 F (37.7 C).

Combustible liquid - a liquid having a flash point at or above 100 F.

**6.3 Compressed Gases**

Compressed gas cylinders, either empty or full, shall be used, handled, and stored in accordance with the following:

- ▶ Compressed gases cylinders must be stored in a vertical position and may not be stored in hallways, stairwells, receiving areas, locations where they are subject to damage.
- ▶ A chain, bracket, clamp, or other restraining device shall be used at all times to prevent cylinders from falling.
- ▶ Acetylene or liquified gas cylinders shall not be placed on their sides, but shall be stood valve-end up.
- ▶ A cylinder, whether empty or full, shall not be used as a roller or as a support.
- ▶ A cylinder, whether empty or full, in storage or during shipment, shall have the valve closed and cap connected in place, if a cap is provided in the design, or the valve shall be otherwise protected.
- ▶ Cylinders shall be marked with either the chemical or trade name. Marking shall be by stenciling, stamping, or labeling and shall not be tampered with or be readily removable. If the labeling is unclear or defaced, return the cylinder or obtain a new label from the supplier. Unlabeled cylinders shall not be used.
- ▶ Empty cylinders shall be marked “empty” or “MT” at time of depletion.
- ▶ Cylinders of oxidizers such as oxygen shall be stored at least 20 feet from fuel gas cylinders or a highly combustible material such as, but not limited to, oil, grease,

flammable gas or a source of ignition, or be separated from the material by a noncombustible wall, not less than 5 feet high, having a fire resistance rating of one hour. All cylinders shall be stored away from heat in excess of 125 degrees Fahrenheit.

- ▶ Where different gases are stored, they shall be grouped by types. Groupings shall separate the flammable gases from the oxidizing gases.
- ▶ Storage shall be set up to ensure "first-in, first-out" usage.
- ▶ A cylinder storage area shall be posted with the names of the individual gases stocked, and a warning posted against tampering by an unauthorized employee. An assigned storage area shall be located where a cylinder will not be knocked over or struck by a passing or falling object.
- ▶ A storage area for cylinders shall be well ventilated. A cylinder shall not be stored in basements or pits except where appropriate ventilation is furnished to keep the area purged of any accumulation of gases.
- ▶ Cylinders shall be transported in an upright position and securely fastened by a restraining device to the truck or handcart. Approved handcarts are to be used when transporting cylinders within a building.
- ▶ When transported, the regulator must be removed and the protective cap replaced.
- ▶ A cylinder shall not be dropped, dragged, rolled on its side, or struck violently.
- ▶ A cylinder shall be lifted only by enclosed platforms when using a crane or hoisting device. Electromagnets, ropes, or slings shall not be used.
- ▶ When transporting cylinders in an elevator, other passengers should not be allowed to occupy the elevator.
- ▶ Use cylinders in an upright position and secure them firmly with chains or clamps.
- ▶ Do not use a cylinder of compressed gas without reducing the pressure through a regulator attached to the cylinder valve.
- ▶ Use regulators and pressure gauges only with gas for which they were designed and intended. Do not use adapters or modify connectors to circumvent this rule.
- ▶ Make sure the threads on a regulator or union correspond with those on the cylinder

valve outlet. Do not force mismatched connections.

- ▶ Never use oil or grease on valves or attachments for oxygen cylinders. Avoid handling oxygen cylinders and apparatus with oily hands, gloves, or clothing.
- ▶ Open cylinder valves slowly with valve outlet directed away from personnel. Close the main cylinder valve as soon as it is no longer necessary to have it open.
- ▶ Gases shall not be mixed within a cylinder except by the supplier.
- ▶ A cylinder shall not be placed where it will become a part of the electrical circuit by accidental grounding or where it may be burned by electric Welding arc. A cylinder shall not be placed so that hot slag or flame will reach it or it shall be protected by a fire resistant shield. An electrode shall not be tapped against a cylinder to strike an arc.
- ▶ A frozen or ice-clogged valve shall be thawed either by warm air or use of warm water and dried before using. Boiling water or a flame shall not be used. Force shall not be applied to a valve or cap to loosen a cylinder frozen in place.
- ▶ A cylinder without fixed hand wheels shall have keys, handles, or non-adjustable wrenches on valve stems while in service. A multiple cylinder installation shall require only 1 key or handle for each manifold. A hammer shall not be used to open a cylinder valve or loosen a cap.
- ▶ A leaking cylinder or a cylinder with a valve stuck open or a valve in need of repair shall be taken outdoors - if it is safe to do so - away from sources of ignition, slowly emptied, tagged with a warning sign, and the manufacturer or distributor notified. Complete removal of the stem from the cylinder valve shall be avoided.
- ▶ Nothing shall be placed on top of a cylinder which would damage a safety device or interfere with the quick closing of the valve.
- ▶ Return empty cylinders to the vendor as soon as possible.