Laboratory Door Placards

University of Tennessee Safety Procedure LS-010

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Purpose

Laboratories often contain hazardous materials, equipment, and processes that could endanger first responders. The purpose of this procedure is to ensure that responsible units and laboratory owners provide emergency responders with posted signage outside of laboratories that adequately identify and communicate significant hazards.

Procedure

The University of Tennessee, Knoxville will use this procedure to provide emergency responders with information regarding the hazards in campus laboratories via a door placarding system facilitated by Environmental Health and Safety and with the participation of laboratory responsible units and principal investigators. The information shall use common and understandable terms and identifiers. They shall be completed in English.

Scope and Applicability

This procedure shall apply to all laboratories on campus that contain or appear to contain hazards. That is, a decommissioned lab may require lab door placard posting if it can be perceived to be a laboratory by emergency responders. The decision to post or not is at the discretion of EHS. Some labs may be identified best by room number; some may be best identified as a suite of rooms. This assignment of what a laboratory space is, is made at the discretion of EHS.

Abbreviations and Definitions

Abbreviations

EHS: Environmental Health & Safety

PI: Principal Investigator

GHS: Globally Harmonized System of Hazard Communication

PPE: Personal Protective Equipment

SDS: Safety Data Sheets

Definitions

Responsible Unit: The campus organizational unit responsible for an area, the most common example being an academic department.

Roles and Responsibilities

EHS shall:

- Administer a program that provides Principal Investigators a mechanism to create door placards for their labs.
- EHS will review and then post the received door placard documents.
- Summarize door placard data as necessary for emergency response and reporting.

Responsible Units (e.g., departments) shall:

- Ensure that laboratory spaces under their control are following this procedure.
- Ensure that laboratory spaces, for which there is no assigned principal investigator, have complete door placards posted with the identity and contact information of an appropriate representative for the department.

Principal Investigators (PIs) or Responsible Person (assigned by the responsible unit) shall:

- Be responsible for accurate information being placed on the door placard, according to guidance in Appendix A: Door Placard Guidance.
- Ensure that the door placard is completed in a timely manner consistent with Laboratory Decommissioning & Commissioning procedures (Safety Manual LS-003).
- Submit the door placard information or form to EHS for processing and posting. (EHS will review and then post the document; please do not print your own unless advised to do so by EHS.)
- Serve as an emergency contact for their laboratory.

References

SA0100 Safety and Environmental Health Program

Laboratory Decommissioning & Commissioning (Safety Manual LS-003).

Appendices

Appendix A: Placard Form

Appendix B: Door Placard Guidance

Appendix C: Additional Definitions

Disclaimer

The information provided in these guidelines is designed for educational use only and is not a substitute for specific training or experience.

The University of Tennessee Knoxville and the authors of these guidelines assume no liability for any individual's use of or reliance upon any material contained or referenced herein. The material contained in these guidelines may not be the most current.

Appendix A:

Door Placard Form

See EHS website for more information on the most recent form

Appendix B:

Door Placard Guidance

The following will serve as a guide to responsible persons for completing the placard information. Please note that a responsible party may elect to post a hazard (if below the threshold for reporting) if he or she considers the hazard to pose a potential threat to emergency personnel.

General Information:

Building:
Enter the official Building Name. The building list is available on the Facilities Services website: https://fs.utk.edu/

Room #:
Enter the official room number. Note that some room numbers vary in some buildings (e.g., Walters Academic Building). Please use the one assigned to the room by Facilities Services.

Department:
Enter the official department name.

Lab Type:
Enter an appropriate brief description of the laboratory type.

Some examples: Machine Shop, Genetic Sequencing, Microbiology, Organic Chemistry, Inorganic Chemistry, Cell Culture

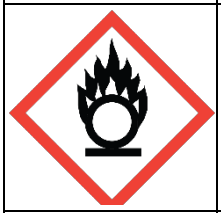
Rev. Date:
Enter the current date of revision in the format MM/DD/YYYY

Pictograms:

The Globally Harmonized System of Hazard Communication adopted by OSHA includes the use of new pictograms on chemical containers. As of June 1, 2015, all chemical labels will be required to incorporate these pictograms. In anticipation of the full implementation of the standard, door placards will incorporate them to make a more cohesive representation of hazards present. However, it is recognized that *de minimis* levels of hazardous materials do not represent a hazard to first responders, and as such, thresholds for reporting hazards are set in terms of concentration, activity and quantity by Environmental Health and Safety.

The following table is to be used in conjunction with chemical container labels, and Safety Data Sheets. If a threshold for reporting is met in the table, the corresponding pictograms should be checked.

Hazard Communication Standard Pictograms

	**Health Hazard:** Carcinogen, Mutagenicity Reproductive Toxicity, Respiratory Sensitizer, Target Organ Toxicity, Aspiration Toxicity *The minimum amount required for posting is **100 grams***
	**Flame:** Flammables, Pyrophorics, Self-Heating, Emits Flammable Gas, Self-Reactives, Organic Peroxides *The minimum amount required for posting is **5 Gallons or one lecture bottle***
	**Exclamation Mark:** Irritant (skin and eye), Skin Sensitizer, Acute Toxicity (harmful), Narcotic Effects, Respiratory Tract Irritant, Hazardous to Ozone Layer (Non-Mandatory) *The minimum amount required for posting is **500 grams***
	**Gas Cylinder:** Gases under Pressure *The minimum amount required for posting is **One Lecture bottle (aerosol cans are not counted here)***
	**Corrosion:** Skin Corrosion/Burns, Eye Damage, Corrosive to Metals *The minimum amount required for posting is **5 Gallons*** *If conc. strong acids or bases, a lower threshold of **~1-2 Gal*** is advised
	**Exploding Bomb:** Explosives, Self-Reactives, Organic Peroxides *The minimum amount required for posting is **Any Amount***
	**Flame Over Circle:** Oxidizers *The minimum amount required for posting is **500 grams or one lecture bottle***
	**Skull and Crossbones:** Acute Toxicity (fatal or toxic) *The minimum amount required for posting is **100 grams or one lecture bottle***

Other Hazards:

Lasers:
Check if class IIIa, IIIb and IV lasers present and enter the class of lasers used. Contact Radiation Safety for more information. Note: Do not include consumer products sealed-source lasers. This is oriented towards research lasers only.

High Pressure Equipment:
Check if using pressurized equipment or apparatus under vacuum operating in excess of 30 psi-absolute (15 psi gauge). This does not apply to building utilities (steam pipes, waterlines, natural gas, and low-pressure pneumatic lines). 100 psi pneumatic lines should be included. This section should not include a compressed gas cylinder in and of itself.

High Voltage ≥ 480 Volts:
Check if using greater than or equal to 480 Volts AC. This includes the presence of 480V electrical distribution panels.

Natural Gas:
Check if Natural Gas is supplied or is in use in the room. It may be advisable to include cut-off locations in the Special Hazards Section

Air/Water Reactive:
Check if using Air or Water Reactive Compounds. If pyrophoric chemicals are involved, a special hazard statement may be prudent.

Hazardous Waste Storage:
Check if hazardous waste is stored in this room. In the special hazards section, the Hazardous Waste Storage location may be provided (e.g., “Hazardous Waste Storage is under fume hood”).

Radioactive Materials:
Check if present. Additional Radiation Safety signage may be necessary, which is administered by Radiation Safety Office. Contact the Radiation Safety Office for more information: 974-5580.

Biohazards (for Class 2 or 3):
Consult the Biosafety Office 974-5547. Additional Biosafety signage may be necessary, which is administered by the Biosafety Office.

Special Hazards or Precautions:

Enter any additional Special Hazards in the room that might not be evident from the selections provided. Some examples of Special Hazards could include Exposed electrical circuits/High magnetic fields within five feet of NMR/Hydraulic equipment in use. Trained personnel only/Poisonous by Inhalation Gases present etc.

Contact Information:

Four contacts shall be provided as available. The primary contact should be the Supervising Staff member or Principal Investigator. The Secondary Contact can be another person strongly associated with the lab such as a staff laboratory manager, the senior post-Doc, or managing graduate student. The contact for the departmental lab safety advocate shall be provided. The department head shall be provided as the final contact.

Contact information may vary with the needs and structure of the responsible units and labs. Consult EHS for any special needs.

Appendix C: Additional Definitions

The following information is intended to familiarize the user with some definitions and potentially hazardous materials. The following can be used to help suggest Special Hazards or to help identify categorical hazards.

Water-reactive chemicals can react violently or vigorously in contact with water, wet surfaces, or even the moisture in the air. These chemicals may react to give off a flammable gas (such as hydrogen) or a toxic gas, (such as phosgene) or spontaneously burn or explode. Water is obviously NOT a good choice for putting out fires caused by water reactive chemicals. A class D fire extinguisher is designed to be used to fight fires caused by certain water reactive chemicals.

Examples include potassium, lithium, sodium, calcium carbide, acid anhydrides, acid chlorides and salt hydrides.

Air-reactive materials – chemicals which react violently in contact with air or oxygen or with compounds containing oxygen. Sometimes air reactive chemicals are called spontaneously combustible or pyrophoric materials. Pyrophoric materials burst into flame spontaneously upon contact with air or oxygen. Spontaneous combustion means that the material does not need an ignition source to begin combustion, or to burn. These materials are sometimes sold in gas cylinders, although they may not be gases themselves. They may be sold packaged under nitrogen or some other inert atmosphere, or they may be created by a chemical reaction in your laboratory. The flame of certain pyrophoric materials is clear and not readily visible. Examples include alkali metals (potassium, cesium), finely divided metal dusts (nickel, zinc, titanium), hydrides (barium hydrides, diborane, diisobutyl aluminum hydride).

Shock/Heat Sensitive Agents – chemicals which may decompose violently if struck or heated. Solids are also prone to explosive decomposition if ground, for example with mortar and pestle or by unscrewing the cap on the container where crystals may be present. Examples of shock sensitive chemicals are Acetylenic compounds, Acyl nitrates, Alkyl nitrates, Alkyl and acyl nitrates, Alkyl perchlorates, Amine metal oxosalts, Azides, Chlorite salts of metals, Diazo compounds, Diazonium salts (when dry), Fulminates, N- Halogen compounds, N-nitro compounds , Oxo salts of nitrogenous bases, Perchlorate salts, Peroxides and hydroperoxides, Picrates, especially picric acid when dry [creanine picric reagent or trinitrile phenol], Polynitroalkyl compounds, Polynitroaromatic compounds. Heat sensitive chemicals are materials with a Self-Accelerating Decomposition Temperature (SADT) such as some organic peroxides, high concentrations of hydrogen peroxide and hydrazine, ethylene oxide, peroxydicarbonate, peroxyacetate, nitro benzyl halides and hydroperoxides. Heat sensitive chemicals should be used in a thermally controlled area.

Compressed Gas Cylinders – substances held in a gaseous state in excess of fifteen pounds per square inch gauge. This category includes all cylinders equal to a lecture bottle and larger. It does not apply to aerosol containers.

Corrosives –substances with a pH less than 3.5 or greater than 10.5. Corrosives can cause tissue damage or corrode metal.

Carcinogenic Agents – substances that have sufficient evidence of carcinogenicity from studies in humans, which indicates a causal relationship between exposures to the agent, substance, or mixture, and human cancer. Some examples include aflatoxins, inorganic arsenic compounds, azathioprine, benzene, benzidine, beryllium and beryllium compounds, 1,3-butadiene, cadmium and cadmium compounds, coal tar and coal tar pitches, cyclosporine A, diethylstilbestrol, estrogens, ethylene oxide, nickel compounds, dioxin, and vinyl chloride.

Teratogenic Agents – substances capable of causing harm to human embryos and fetuses. Exposure to teratogens can result in a wide range of structural abnormalities such as cleft lip, cleft palate, dysmelia, anencephaly, ventricular septal defect. In most cases, specific agents produce a specific teratogenic response. Some examples are 13-cis-retinoic acid, isotretinoin (Accutane), temazepam (Restoril; Normisson), nitrazepam (Mogadon), nimetazepam (Ermin), aminopterin, androgenic hormones, busulfan, captopril, enalapril, chlorobiphenyls (PCBs), Dioxin, coumarin, cyclophosphamide, diethylstilbestrol, diphenylhydantoin (Phenytoin, Dilantin, Epanutin), ethanol, ethidium bromide, etretinate, hexachlorophene, lithium, methimazole, organic mercury, penicillamine, tetracyclines, thalidomide, trimethadione, uranium, methoxyethyl ethers and valproic acid. .

Mutagenic Agents – an agent, such as a chemical, ultraviolet light, or a radioactive element, which can induce or increase the frequency of mutation in an organism. Some examples include base analogs, which can substitute for DNA bases and cause copying errors, deaminating agents such as nitrous acid; intercalating agents such as ethidium bromide; alkylating agents such as ethylnitrosourea; transposons, sections of DNA that undergo autonomous fragment relocation/multiplication; some natural plant alkaloids, such as those from vinca species; bromine and some of its compounds; sodium azide; psoralen combined with ultraviolet radiation causes DNA crosslinking and hence chromosome breakage.

Cryogenics – substances that exist in a closed container below –150 °C, –238 °F or 123 K. Examples include liquid nitrogen and liquid helium. The minimum reporting threshold for this category is four liters. These may be noted under special precautions.

Flammables – substances that exist in a solid, liquid, or gaseous state and meet the definition of flammable by one of the following:

Flammable liquids: Any liquid having a flash point less than 140 degrees F.

Examples include acetone, ethanol, methanol, xylene, acetaldehyde, acetonitrile, benzene, cyclohexane, diethylamine, dioxane, ethyl ether, hexane, tetrahydrofuran, and toluene.

Flammable solids: are any materials in the solid phase of matter that can readily undergo combustion in the presence of a source of ignition under standard circumstances, i.e., without artificially changing variables such as pressure or density, or adding accelerants. Examples include camphor, cellulose nitrate, naphthalene, decaborane, lithium amide, phosphorous heptasulfide, phosphorous sesquisulfide, potassium sulfide, anhydrous sodium sulfide, sulfur, cesium, magnesium and zirconium, aluminum powder, calcium/magnesium/sodium metals.

Flammable gases: a material which is a gas at 68 °F (20 °C) or less at 14.7 pounds per square inch atmosphere (psia) (101 kPa) of pressure [a material that has a boiling point of 68 °F (20 °C) or less at 14.7 psia (101 kPa)] which:

1. Is ignitable at 14.7 psia (101 kPa) when in a mixture of 13 percent or less by volume with air; or
2. Has a flammable range at 14.7 psia (101 kPa) with air of at least 12 percent, regardless of the lower limit.

Examples include acetylene, 1,3-butadiene, n-butane, carbon monoxide, diborane, ethylamine, ethylene oxide, isobutane, and trimethylamine.