

MSU CHEMICAL SAFETY LABORATORY CHECKLIST

Location: _____ Safety Rep: _____
PI: _____ Inspection Date: _____
Department: _____ Inspected By: _____

GENERAL

- Yes No NA 1. Emergency phone numbers are posted on the laboratory door.
- Yes No NA 2. Warning signs are posted on doors.
- Yes No NA 3. Right-to-Know law bulletin is posted within department.
- Yes No NA 4. All personnel know how to obtain MSDSs.
- Yes No NA 5. All personnel have received Lab Specific Training.
- Yes No NA 6. All personnel have received ORCBS Lab Safety Training.
- Yes No NA 7. Lab coats are available.
- Yes No NA 7a. Lab coats are worn.
- Yes No NA 8. Chemical protective gloves are available.
- Yes No NA 8a. Reusable gloves are in good condition.
- Yes No NA 9. Safety glasses/goggles are available.
- Yes No NA 9a. Safety glasses/goggles are worn.
- Yes No NA 10. An eyewash fountain is present (deck, drench, combo, faucet, plumbed, portable).
- Yes No NA 10a. Eyewash/shower is unobstructed.
- Yes No NA 10b. Eyewash test log is available.
- Yes No NA 10c. Eyewash design, location and quantity is adequate.
- Yes No NA 11. An emergency shower is present (in room, in hallway, in neighboring lab).
- Yes No NA 12. Food and beverage are not stored or used in lab.
- Yes No NA 13. Aisles are uncluttered and without a tripping hazard.
- Yes No NA 14. Chemical spill kits are available.
- Yes No NA 15. Non-contaminated sharp objects labeled, puncture-proof containers.
- Yes No NA 16. Fume hoods have current ORCBS inspection sticker.
- Yes No NA 17. All exit ways are free and unobstructed.
- Yes No NA 18. Fire extinguishers are available and unobstructed.
- Yes No NA 19. Fire extinguishers have DPPS tag and are sealed.
- Yes No NA 20. Current inventory of chemicals is available.
- Yes No NA 21. Chemical Hygiene Plan is available.
- Yes No NA 22. Laboratory SOP's are available.

CHEMICAL STORAGE AND HANDLING

- Yes No NA 1. Gas cylinders are properly secured.
- Yes No NA 2. No leaking containers are present.
- Yes No NA 3. All chemical containers are properly labeled.
- Yes No NA 4. Chemicals are stored according to compatibility.
- Yes No NA 5. Peroxide forming reagents are dated when opened.
- Yes No NA 6. Peroxide forming reagents are disposed of or tested after expiration date.
- Yes No NA 7. Flammable and corrosive storage areas are labeled.
- Yes No NA 8. Flammables are kept away from sources of heat, ignition, flames, etc.
- Yes No NA 9. Corrosive materials are stored low to the ground.
- Yes No NA 10. Carcinogen storage area(s) is labeled.
- Yes No NA 11. Chemicals in the open are kept to a minimum.
- Yes No NA 12. Flammable/Combustible liquids do not exceed NFPA storage limits.
- Yes No NA 13. Flammable/Combustible liquid total volume is not greater than 10 gallons.
- Yes No NA 14. Flammable gases are not present.
- Yes No NA 15. Poisonous gases are not present.

CHEMICAL WASTE

- Yes No NA 1. Hazardous waste containers are labeled and have closed lids.
- Yes No NA 2. Hazardous waste tags are complete.
- Yes No NA 3. Hazardous wastes are not stored beyond 90 days.

Chemical Safety Lab Inspection Criteria

GENERAL

1. Emergency phone numbers are posted on the laboratory door.

- A 12*12 “caution” sign should be on the main entrance.
- Be sure the following Names and Phone Numbers are listed on the lab door:
 1. MSU Police (911)
 2. ORCBS (5-0153)
 3. Project Director (Name and Phone Number)
 4. One other Lab Person (Name and Phone Number)
- Secondary entrance should have the 4*5 number sticker
- Be sure that the names and numbers listed are correct and current.

2. Warning signs are posted on doors.

- If the lab contains 10 gallons or more of flammable liquids, post a flammable solvent label on the door.
- If the lab contains radioactive materials and there is no Radioactive sticker on the door, contact a Health Physicist.
- If the lab contains Biosafety 2 materials and there is no Biohazard sticker on the door, contact a Biological Safety Staff member.
- If the lab contains larger amounts of corrosives outside of storage areas, such as acid baths, put a corrosive sticker on the door.
- In general, it is not a good idea to put carcinogen stickers on the main door. This makes the whole room a designated area.

3. Right-to-Know law bulletin is posted within department.

- Post a Right-to-Know bulletin if one is not present.
- List specific location of Material Safety Data Sheets on the poster. Put any lab or department locations, and the ORCBS phone (5-0153) and web site (<http://www.orcbs.msu.edu>) as sources of MSDS.
- Although the requirement is departmental, we are putting these in each lab.

4. All personnel know how to obtain MSDS's.

Interview lab personnel to assess if they know that MSDS's can be obtained by:

- Looking in their departmental MSDS file
- Calling or faxing the ORCBS with an MSDS request, or making a request on-line during normal working hours
- Calling DPPS after hours, on weekends and holidays with their request and the ORCBS will be notified

The ORCBS has approximately:

- Twenty thousand generic MSDS's on CD-Rom (electronic form)

Chemical Safety Lab Inspection Criteria

- Nineteen thousand company specific MSDS's on file (hardcopy form)

5. All personnel have received Lab Specific Training.

View lab specific training documentation. If no documentation is available, put a no. Give them an ORCBS form.

All employees who work in laboratories where chemicals or other hazardous materials are used or handled must have specific training on tasks as well as the general laboratory facility they will be working in. This is part of the Hygiene standard that makes the CHP specific to their lab.

6. All personnel have received the ORCBS Chemical Hygiene and Laboratory Safety Training Class.

- Give lab personnel copy of worker training report. Update the training report by crossing off people that have left, and write in those that are working in a lab with hazardous chemicals, but are not on the list.
- If no additions were made, audit that everyone needing the chemical hygiene training has received it (CHI)
- If additions were made, audit training once the list is updated. This cannot be done in the lab.
- Record a score for compliance for initial training under comments. For example if 10 people work in the lab, but only 6 are properly trained, record 6/10.
- Any person working in a lab with hazardous chemicals needs this training. Supervisors of lab personnel that do not themselves generate hazardous waste still need this training.
- Schedules and sign up are on the training page(s) of the ORCBS web site.

7. Lab coats are available.

Lab coats should be:

- A basic form of personal protective equipment (PPE)
- Available to all employees
- Laundered at the MSU commercial laundry facilities; never at home because of possible contamination

If a lab does minimal chemical work and does not have any lab coats, assure that they know that lab coats are available from MSU laundry.

7a) Lab coats are worn.

Chemical Safety Lab Inspection Criteria

Observe the number of people working with chemicals. Record a score for those wearing a lab coat/ total number working with chemicals.

The ORCBS recommends that lab coats be worn whenever chemicals are handled in a lab.

8. Chemical protective gloves are available.

View the gloves that are available to lab employees.

Chemical protective gloves are:

- A basic form of personal protective equipment (PPE)
- Available to all employees
- Changed on a regular basis; never wear gloves that are worn through
- Available at General Stores or Advanced Glove or any other scientific supplier
- Selected with help of the ORCBS glove guide

8a) Reusable gloves are in good condition.

- Inspect reusable gloves in the lab. They should be replaced whenever they become discolored or show signs of damage.
- Immersion or prolonged contact is not common for chemical work in the laboratory. Therefore, reusable gloves do not need to be replaced very often.

9. Safety glasses/goggles are available.

- View the selection of eye protection available in the lab. Assure that it is in good condition, including straps and general cleanliness. If impact goggles are present (direct vented), remove them from the lab during the inspection. Throwing them away is the best option.

9a) Safety glasses/goggles are worn.

- Make sure eye protection is correct for the operations being performed. Eye protection should be used based on the following table:

Operation	Eye Protection Required
Entry into Laboratory or Liquid Chemical Area when a probability of eye injury exists	Safety Glasses
Handling Corrosive Chemicals	Splash Goggles
Handling Injurious Chemicals	Splash Goggles
Transferring more than one liter quantities of Corrosive Chemicals	Splash goggles and face shield

Chemical Safety Lab Inspection Criteria

- Impact goggles offer adequate protection against flying particles.
- Chemical splash goggles offer the best protection against chemical splashes.
- When face shields are worn, there still needs to be appropriate eye protection underneath.

Record a score for the number of people wearing proper eye protection while working with chemicals. See the above table for guidelines on eye protection.

10. An eyewash fountain is present.

These are required in laboratories which use or store injurious or corrosive chemicals.

Eyewash stations should be labeled with an eyewash sign next to it.

- 1) Deck: means a deck mounted eyewash unit
- 2) Drench: means a drench hose with a single spray head and NOT an eyewash that has 2 spray heads
- 3) Combo: means a combination eyewash and drench hose
- 4) Faucet: means an eyewash that screws onto the faucet of a sink
- 5) Plumbed: means an eyewash or eyewash/shower combination that is a stand alone unit and not mounted on a deck
- 6) Portable: means an eyewash that has a tank or bottle of potable water

10a) Eyewash or Shower is obstructed.

Assess if the eyewash station is accessible for use in case of an eye exposure to chemicals. This includes being able to stand in front of the eyewash, lean over and rinse both eyes. In general, a 6 inch radius around the eyewash is needed.

10b) Eyewash test log is available.

View the test log. Assure that it is being flushed once per week.

If no test log is available, give them a copy of our version.

As per the ANSI standard, eyewash stations must be flushed once per week and documented with a log. Flushing assures proper function, which may be degraded with iron buildup or other malfunction.

10c) Eyewash design, location and quantity is adequate.

As per the ANSI standard, an eyewash must be located within 10 seconds of the hazard, and recommends that for strong corrosive or caustics, they be immediately adjacent to the hazard.

Also:

- The unit must be hands free and be able to be turned on in 1 second.
- Flow rate is .4 gallons per minute for at least 15 minutes.

Chemical Safety Lab Inspection Criteria

- Both eyes must be able to be flushed (see special case).
- Flushing velocity must be low enough so as to not injure the eyes.
- The eyewash must not pose a hazard to the user.
- Nozzles are to be protected from airborne particles, and must not require separate removal for use.
- The unit must be between 33 and 45 inches from the floor, and 6 inches out from the nearest wall or obstruction, and no more than 12 inches back from the front of the countertop.
- MiOSHA requires eyewashes to be within 25 feet of chemicals with a pH<2.0 or pH>12.5, or those that can cause tissue damage (MEKP)

11. An emergency shower is present.

A drench hose or an eyewash/drench hose combo is not an emergency shower. Emergency showers are:

- Usually located in the hallway
- To be flushed out every three months as per ANSI recommendations; Physical Plant currently has this responsibility
- To be free from clutter so access is not blocked

12. Food and Beverage are not stored or used in lab.

- Look for food and drink, or evidence of food and drink in the lab.
- If pop cans or coffee cups are present, mark no on this question.
- Food and drink must be consumed outside of the lab or in a room that is separated from chemicals by floor to ceiling walls and a door that closes.

13. Aisles are uncluttered and without a tripping hazard.

- Inspect for electrical cords or hoses across aisles, or any other tripping hazard. Tripping hazards can include permanent as well as temporary items.
- If tripping hazards are taped or covered with a plastic sheath, the hazard has been abated, and a yes can be given.
- Employees must have clear access to eyewashes, showers, extinguishers and exits.

14. Chemical spill kits are available.

- Ask lab employees to show you the spill kit. If they cannot locate spill kit, mark no.
- If later in the inspection, the spill kit is found, mark a yes, but make a comment that lab workers did not know where spill kit was.
- Laboratories can share spill kits as long as everyone has access to it and knows how to use it. It should still be accessible in a reasonable amount of time.

Chemical Safety Lab Inspection Criteria

- The recommended kit can be purchased from General Stores (stock #165-7142) for under \$50.00.
- Spill kits can be homemade if they contain the appropriate absorbents and PPE to contain and clean up small spills.

15. Non-contaminated sharp objects in labeled, puncture -proof containers.

- Ask what is done with broken glass. If it is put in a labeled, puncture proof container put a yes.
- Audit that only broken glass is in the container, no paper debris, and that there is no plastic bag lining the container.

16. Fume hoods have current ORCBS inspection sticker.

- Look on the fume hood for an inspection sticker.
- Assure that the fume hood has been rated in the last year. If not, tell the IH in charge of fume hoods.
- Fume hoods that have received the "UNSATISFACTORY" label may not be used for work with chemicals. However, it is acceptable for the hood is used as extra counter space.
- Do not store excessive amounts of chemicals or equipment in the fume hood that could interfere with the airflow.

17. All exit ways are free and unobstructed.

- Inspect for a blocked or obstructed laboratory exit that would prevent it from being used in an emergency.

18. Fire extinguishers are available and unobstructed.

- Assess if a fire extinguisher is available, within 50 feet of flammable liquids.
- Assess if fire extinguisher can be accessed quickly, and that it is visible.
- If a fire extinguisher is not available, mark N/A
- If a lab does not have a fire extinguisher, and would like the need assessed, they can call the MSU fire marshal.

19. Fire extinguishers have DPPS tag and are sealed.

- All fire extinguishers MUST have a DPPS fire marshal tag and must have an intact pin.
- Contact the MSU fire marshal's office if an extinguisher does not have a tag or pin.

20. Current inventory of chemicals is available.

- Ask if an inventory is available. If possible, view the inventory, but it is not required to see it to mark a yes.

Chemical Safety Lab Inspection Criteria

- Although the chemical hygiene standard does not require a chemical inventory, the ORCBS recommends that it is known what is in the laboratory, where materials are stored and where they are used.

21. A copy of the MSU Chemical Hygiene Plan is available.

- View the lab's copy of the CHP.
- All labs are required to have the CHP in the lab to make it a legal document. It may be copied or downloaded from the ORCBS website.

22. Standard Operating Procedures are available.

- View the lab SOP's
- The CHP contains general Standard Operating Procedures. When a lab does work or operations that are not covered by the CHP, they must develop a lab specific SOP. This must address such issues as: Hazards, PPE, Engineering Controls, MSDS location, Waste Disposal, Decontamination and any other information needed to address safe operation.
- There are pre-made SOP's and a general form for developing SOP's on our web site.

CHEMICAL STORAGE AND HANDLING

1. Gas cylinders are properly secured.

- Inspect that cylinders with regulators are individually secured to an immovable object with a chain or strap.
- Cylinders with caps in place may be "gang-chained" (secured in groups) to an immovable object with a chain or strap.

2. No leaking containers are present.

- Inspect storage areas for leaky containers.
- Leaks may be found:
 1. Around seals of the containers
 2. In back of cabinets
 3. Under sinks
 4. In refrigerators

3. All chemical containers are properly labeled.

- Inspect all containers for labeling. They must contain the name and hazard warning, or be in the manufacturer's bottle.
- Containers that are for use within a work shift, and are in direct control of the user, do not need to be labeled. However, it is a good idea to label them anyway.
- If there are numerous small containers that need to be labeled, the tray, shelf, cupboard or refrigerator must be clearly marked with the appropriate information.

Chemical Safety Lab Inspection Criteria

4. Chemicals are stored according to compatibility.

- Inspect that chemicals are stored according to compatibility and that the storage area is labeled with either flammable, corrosive or perchloric acid storage only. The current chemical segregation groups are:
 - Flammables
 - Corrosives
 - Perchloric Acid.
- Flammables include organic liquids, flammables, combustibles, organic acids and Halogenated solvents. Halogenated solvents are not flammable, but this is the proper place to store them. Examples include acetone, hexane, acetic acid, phenol, and chloroform.
- Corrosives should be separated into two groups: acids and bases. Acids and bases can be stored in separate cabinets, or in the same cabinet if they are in separate secondary containment. Organic acids should be stored with the flammables, and not with inorganic oxidizing acids such as nitric acid sulfuric acid. Acetic acid and hydrochloric acid can be stored together as they are compatible. However it is recommended that organic acids be stored with flammables to prevent the inadvertent addition of oxidizing acids.
- Concentrated perchloric acid should be stored alone in a cabinet by itself.

5. Peroxide forming reagents are dated when opened.

- Peroxide forming reagents need a date of receipt and a date of opening.
- Ether, Dioxane, THF and isopropyl ether are tracked as peroxide forming chemicals.

6. Peroxide forming reagents are disposed of or tested after expiration date.

- Check the date on the container; if no date or out of date, call the container in as a hazardous waste pickup. The storage time for unopened peroxide formers is 18 months. Also check for the manufacturer's expiration date.
- Tell lab workers to test the chemical for formation of peroxides by using basic protocols for detection and inhibition of peroxides from Appendix H of the Chemical Hygiene Plan. This testing should be documented on the bottle.

7. Flammable and corrosive storage area(s) is labeled.

- A Flammable Liquid label must be attached to cabinets, refrigerators or cupboards that are used to store flammable or materials. A corrosive sticker must be on cabinets storing acids or bases, and on acid baths.

8. Flammables are kept away from sources of heat, ignition, flames.

Chemical Safety Lab Inspection Criteria

- Inspect for flammable materials near instruments that could present a spark potential. Equipment such as vacuum pumps, portable heaters, bunsen burners, etc. could all present an explosive situation if flammable materials are stored in the near proximity.
- If flammable liquids are stored in a refrigerator, assure that it is explosion proof.

9. Corrosive materials are stored low to the ground.

- Look for corrosive materials no higher than 2 feet above floor level, especially larger volumes. (within reason)

10. Carcinogen storage area(s) is labeled.

- If any chemical carcinogen is stored, the area must be marked with the cancer hazard label.

11. Chemicals in the open are kept to a minimum.

Chemicals in the open includes:

- One gallon or greater flammable liquid containers, that are not in use, stored outside of metal or flammable liquid cabinets. If these are present, mark no. Flammable safety cans are exempt.
- Glass containers with liquids on floor.
- 5 pound or 5 gallon containers of reactivities/oxidizers are not allowed in a working laboratory. They must be stored in a designated chemical storage room. The Chemical Safety Officer must approve exceptions.
- Sample and other containers must have closed lids.
- Work areas must be separate from storage areas.
- Containers are not stored securely in a stable fashion.

12. Flammable/Combustible liquids do not exceed NFPA storage limits.

- Inspect for amounts based on NFPA table
- If limits are exceeded, some chemicals will have to be moved to other locations or flammable storage cabinets will need to be purchased.
- See Appendix E of the Chemical Hygiene Plan for tables listing quantities.

13. Flammable/Combustible liquid total volume is not greater than 10 gallons.

- If there are more than 10 gallons of flammable or combustible liquids in the laboratory, the door must be labeled with a flammable solvents sticker.

14. Flammable gases are not present.

- Record the specific type of gas in the comments

Chemical Safety Lab Inspection Criteria

15. Poisonous gases are not present.

- Record the specific type of gas in the comments
- Poisonous gases should be in ventilated cabinets, or fumehoods. Labs should remove of poison gases that are not being used, and purchase the smallest amounts possible (lecture cylinders or 4-L tanks)

CHEMICAL WASTE

1. Hazardous waste containers are labeled and have closed lids.

Inspect all waste containers for:

1. The words "Hazardous Waste"
2. If the container is not immediately being used, there is a closed lid on the container.
3. Containers that are labeled "methanol waste" or "solid waste" etc are not labeled properly.
4. Unknown chemicals are likely hazardous waste
5. Chemicals that have not been in use, and do not look like they have been used, and are not planned to be used should be disposed of. EPA may cite for many unused chemicals as mismanaged hazardous waste.

2. Hazardous waste tags are complete.

Inspect waste tag for:

1. Information on the top front filled out completely
2. Chemical name and contents listed, including amount or concentration. Abbreviations are not acceptable.
3. The start date of when material was first added
4. The checkboxes for the description are filled out

3. Hazardous wastes are not stored beyond 90 days.

- Look at date on waste container. If it is past 90 days, put a no for this