

EH&S inspects all labs on campus at least annually. However, **lab supervisors should initiate regular self-inspections** (recommend minimum of twice-a-year) for the following reasons:

- Under California law (OSHA), supervisors (PIs) are required to: “... include procedures for identifying and evaluating work place hazards including scheduled periodic inspections to identify unsafe conditions and work practices.”
- Beyond any regulatory requirements, doing regular self-inspections will clearly increase the level of safety in your area.

To aid you in your surveys, a Self-Inspection Checklist follows, this is not a list of every possible safety issue, but are guidelines. Most items are based on applicable regulations or campus policy. Radiation and biohazard issues are not addressed here because they are highly specialized and these labs receive targeted EH&S visits. More information is also available at <http://ehs.ucsb.edu>. The links (underlined) noted below lead to further information.

Hazardous Waste

1. Are personnel generating chemical waste trained with waste disposal procedures? Individuals who have not taken the UCSB Fundamentals of Lab Safety course (live or on the EH&S website) must take this course before generating hazardous waste for disposal **Online Hazardous Waste Generator training*** (EH23)
(*This course meets the waste management training requirements enforced by Cal-EPA)
 2. Is the illegal disposal of hazardous substances down the drain prevented?
 3. Are all hazardous waste containers labeled with the official UCSB Hazardous Waste label?
 - Is there a supply of UCSB waste labels handy (available in all campus storerooms)?
 - Are **labels** attached when the **first drop** of waste goes into the container?
 - Are all constituents in mixtures identified, as well as their concentrations?
Do not use generic names like “*Waste or Organic waste*” instead use proper chemical name(s).
 - Are chemically incompatible wastes segregated?
 - Is there a designated area for storage of hazardous waste and <https://www.ehs.ucsb.edu/sites/default/files/docs/hw/hazsign07.pdf>?
 4. Are lab personnel instructed not to dispose of chemicals by fume hood evaporation?
By law, waste containers must be capped when not in use.
 5. Is chemical waste disposed of within **9 months** of their accumulation, *regardless how much material remains inside the container*? Contact [EH&S for waste disposal](#).
 6. Are all “**sharps**” (*syringes, razor blades, etc.*) disposed in puncture resistant, leak-resistant containers and sealed tightly to preclude loss of contents? Submit an online request for EH&S disposal following the guidelines.
- Laboratory Glass:** Is there a designated glass disposal container in the lab?
Lab personnel are responsible to empty these into their bldg. red-lidded trash can – custodial staff will not do so.
7. **Obtain Free Waste Venting Caps:** If you use Aqua Regia solutions, Piranha Solutions, Nitric acid waste, [contact us \(link sends e-mail\)](#) to receive free venting caps. For more info, view [Vented cap video \(link is external\)](#).

PLEASE USE THIS LABEL WHEN FIRST DROP OF WASTE IS GENERATED
UCSB HAZARDOUS WASTE
(must be completed, labels & containers for use on campus. Processes vary by activity)

Family Name: _____ Department: _____ Phone: _____ Fax: _____

Principal Chemist/Inventor: _____

Physical State: Liquid Solid Gas To request waste disposal go to www.ehs.ucsb.edu

Chemical hazard identification: Corrosive Compressed Gases Oxidizer Flammable Toxic Infectious

Image of an emergency contact: 0120-0165 at 01/09

Chemical Safety

1. Chemical Hygiene Plan (CHP)

<input type="checkbox"/> Is your lab's legally-required (Cal-OSHA) CHP Lab-specific complete and shared with all workers?
<input type="checkbox"/> Has the CHP been reviewed and evaluated for effectiveness, must be done annually?
<input type="checkbox"/> Have lab personnel signed the training page?
<input type="checkbox"/> Does your CHP address your use of OSHA <u>Particularly Hazardous Substances</u> (human carcinogens, acute toxins, reproductive toxins, and pyrophorics)? Personnel working with these materials shall receive documented training.

- Are Cal-OSHA regulated carcinogens such as formaldehyde/formalin, dichloromethane, and benzene always used in a fume hood and with appropriate gloves/eyewear?
- Are chemical containers properly labeled with chemical name and hazard type of the material (e.g., repackaged materials and lab-synthesized materials)? No symbols or abbreviations may be used.
- Are stored chemicals segregated according to hazard classification/compatibility (acids, bases, flammables, oxidizers, water reactives, etc.)? Compatibility Chemical Storage Chart
- Are all containers of peroxide-forming chemicals (e.g., ethers) dated upon receipt and disposed of within the prescribed time period (contact EH&S for prompt disposal)? Peroxides can be explosively unstable.
- Check chemical stocks regularly for materials that can become dangerously unstable over time and dispose of via EH&S. Links to descriptions of these materials can be found at:
https://www.ehs.ucsb.edu/sites/default/files/docs/lis/factsheets/TimesensitiveChemicals_FS25.pdf
- Are flammable liquids kept inside approved flammable storage cabinets whenever possible?

<input type="checkbox"/> Are flammable liquids always stored in approved flammable cabinets when in excess of 10 gallons?
<input type="checkbox"/> Do you have large volumes of flammable solvents (e.g., multiple cases or drums) in storage that are above what is reasonably needed? The quantities of flammables that can legally be stored are regulated by CA Fire Code. Please don't stockpile large quantities of these materials.
<input type="checkbox"/> Are flammable liquids stored away from sources of heat, ignition, electrical equipment or sources of static electricity?
<input type="checkbox"/> Static Electricity – Electrically-ground all metal containers/equipment involved in the pumping/pouring of flammable liquids to prevent buildup of static electricity as an ignition source. Flammable liquids dispensed from metal cans must be bonded and grounded to prevent a fire as explained in the laboratory SOP.

- Are acid volumes greater than 10 gallons stored in an approved storage cabinet?
- It is highly recommended chemical spill cleanup materials be available.

Are all lab workers familiar with the location of spill cleanup kits?

Spill kits are available at EHS. Contact hgacu@ucsb.edu

Note: Some lab buildings have a designated "spill closet" – generally keyed to graduate master key.

Laboratory Equipment

1. Are the eyewash and emergency shower stations free of any obstructions which would prevent ready access? These units are tested and documented by FM regularly. It is recommended that labs run their eyewash units monthly to maintain clean water in the lines.

2. Have fume hoods been EH&S tested within the year (check label)?

<input type="checkbox"/> Is an air flow/digital indicator present and operational? <i>If not, contact EHS for repair.</i>
<input type="checkbox"/> Is lab equipment or chemicals within the hood minimized? Keep only items in use.
<input type="checkbox"/> Are air entry slots at back of hood kept clear of obstructions? Cluttered hoods interfere with proper air flow.
<input type="checkbox"/> Is the front sash lowered to the appropriate level when hood is in use? If the low flow alarm engages, lower the sash until the alarm stops. If the alarm continues when the sash is lowered please contact EH&S at x8243. DO NOT over-ride the safety alarm by permanently engaging the "Mute" or "Emergency" button (e.g., with tape, paper clips, etc.).
<input type="checkbox"/> Has everyone using a fume hood been properly trained to use their fume hood? <i>General fume hood use is covered in the Fundamentals of Lab Safety training course.</i>

3. Are biological safety cabinets certified annually or when moved (check sticker) and are they the proper types for the work being conducted?

4. Do labs using non-ionizing radiation equipment, such as lasers, microwaves, and ultraviolet light sources, have properly posted warning signs and shielded work areas? Documented training?

5. Compressed gas cylinders

<input type="checkbox"/> Are cylinders dated upon arrival and contents clearly identified?
<input type="checkbox"/> Inspect regularly for defects, i.e., excessive rust, dents, bulging, corrosion, etc.
<input type="checkbox"/> Unidentified cylinders should be marked, "CONTENTS UNKNOWN" and returned to the manufacturer.
<input type="checkbox"/> Non-lecture bottles \geq 5 years old must be returned to the manufacturer to ensure they are safety/pressure tested as required by law ("hydrostatic testing") Check stamped date on cylinder when it was last tested.
<input type="checkbox"/> Corrosive gases (e.g. HF, HBr, HCl, H₂S) can degrade the cylinder over time and/or produce dangerously high pressures of hydrogen. Dispose of within 2 years.
<input type="checkbox"/> Are cylinders secured upright with two welded chains and brackets bolted to a wall, bench or other secure object (no C-clamps type)?
<input type="checkbox"/> Are protective caps in place while cylinders are not in use?
<input type="checkbox"/> Flammable gases (e.g. hydrogen, methane) tubing should be equipped with a flash arrestor to prevent flame flashback to cylinder. Available from gas vendors.
<input type="checkbox"/> Ensure gas tubing is appropriate for the material being used.
<input type="checkbox"/> Do not use Teflon tape or "pipe dope" on CGA connections unless specified by the equipment manufacturer. Particularly avoid this with oxygen systems.
<input type="checkbox"/> Use of large cylinders of highly toxic gases must be reviewed/approved (contact EH&S, x-4899)
<input type="checkbox"/> Highly toxic gas cylinders should be equipped with a reduced flow orifice (RFO) connection to prevent rapid discharge of cylinder contents. Available from gas vendors.
<input type="checkbox"/> Gas cabinets with toxic or flammable gas delivery manifolds often have an excessive flow detection and auto-shutoff valve built-in. Verify that this safety feature is functional.

6. Lab refrigerators

<input type="checkbox"/> Are refrigerators for storing flammables clearly posted with signage indicating they are safe for such storage? (e.g. "desparked", "lab-safe", "explosion-proof", "flammable storage").
<input type="checkbox"/> Are refrigerators that are NOT designed for flammables storage clearly marked as such? (this is very important to prevent a potential explosion)
<input type="checkbox"/> Are all chemical storage refrigerators marked with "No Food" labels?
<input type="checkbox"/> Refrigerators in labs utilized for food or drinks should be marked "Food Only/No Chemicals?"

7. Is the location of manuals/instructions for each piece of equipment known?

8. Are the belt guards in place on all pumps, etc.?



9. **Solvent stills with water-reactive drying agents**

- Are solvent stills clearly labeled with the solvent name and drying reagent?

- Ensure water-flow monitor are installed that would automatically shut off the heating mantles in the event of cooling water loss (pic with arrow). Periodically test monitors by shutting down the water flow to verify the system is functioning properly. They are available commercially.

We strongly recommend this important safety device be adopted. Fires associated with stills are not uncommon, including the \$3M fire at UCI in 2001.



- Ensure secondary containment pans are beneath the stills. In the event of a system leak this should capture any leakage and prevent the solvent from spreading out and finding an ignition source.

- **Quenching Solvent Stills** -The quenching of used still-pots is potentially dangerous but can be done safely if appropriate precautions are taken. "See [EH&S Fact Sheet](#) on still quenching"

- **Pressurized Systems** - Inspect and test all high-pressure vessels regularly per the owner's manual requirements. Each vessel should have a use-log of: *experiment conditions, dates of runs, testing/maintenance history, etc.* in order to track the vessel's life-expectancy. Pressure vessels must include a functional over-pressurization rupture disk to prevent a catastrophic vessel failure.

General Safety Concerns

1. Has EH&S posted outside the lab an [emergency information contact sign](#), indicating the hazards within, responsible persons and phone numbers? Is the information correct? Call EH&S to update (x-8243).

2. Has the [UCSB Campus Emergency Flip Chart](#) been posted in the work area? Has the, [Building-Specific Emergency Information section](#) page been completed?



3. Are rooms containing regulated hazardous substances, such as infectious and radioactive materials, posted with warning/caution signs and appropriate authorizations?
4. Are aisles free of obstructions? Minimum clearance for lab aisles is 2 ft.
5. Do work areas have adequate ventilation and illumination? To prevent suffocation, verify that fresh air is supplied to cold/hot rooms that are used as work areas. Check emergency door release and alarm mechanisms.
6. Are fire extinguishers functional (plastic seal and metal pin intact and dry powder units show pressure)? Are the extinguishers located on their wall hooks? Is the area in front of the extinguishers accessible?
7. Are food and beverages kept out of chemical work areas and out of laboratory refrigerators?
8. Is everyone familiar with the [UCSB Laboratory Personal Protective Equipment \(PPE\) Policy](#)? Minimum attire: Full length pants (or equivalent) and closed toe/heel shoe attire must be worn at all times by all workers who are occupying or entering a *laboratory/technical* area; unless exceptions have been determined per policy.

For more PPE information, including glove reference charts, click [link](#).

- a. Any extra or unwanted lab coats in the laboratory? To recycle unwanted coats, drop them into a designated bin located in the same locations as the existing coat [laundering stations](#). *It is important to only issue new workers coats via the LHAT and campus PPE storeroom, so that the coat issuance can be legally documented and the individual gets the proper type and size of coat.*

9. Have all respirator and dusk mask users been certified by the EH&S [Respiratory Protection Program](#)?



10. Is the level of [housekeeping](#) in the lab satisfactory?

WHAT TO LOOK FOR IN YOUR LAB:
No hazardous materials stored on floor and away from the edge of lab bench
Aisles, secondary exits and corridors kept clear
Keep lab benches and hoods as uncluttered as possible.
Glassware that is scattered on benches and out in the open clutters working areas, is easily broken, will not stay clean, and, if dirty, may be confused for clean glassware and could potentially negate any viable research.

11. Lab doors are fire-rated and therefore cannot be propped open with a wedge or other device. Discontinue use of these, or SB County Fire may confiscate them and cite the University.
12. Secure your highly hazardous materials, e.g. highly toxic gas, radiation, select biological agents. Ensure the lab door(s), freezers, refrigerators, storage cabinets, etc. with these materials are locked whenever the lab is unattended.

Electrical Safety

1. Check electrical equipment and inspect for frayed cords and damaged connections? Electrical tape is prohibited.
2. Multiple outlet strips plugged directly into a wall outlet? Does the power strip have a circuit breaker?
Extension cords are not to be permanently used with power strips.



3. Are employees instructed **not** to use extension cords in place of permanent wiring (use allowed if only on a temporary, immediate, basis)? Have permanent receptacles installed for long-term electricity needs.
 - Ensure extension cords are 14-gauge (heavy duty) at a minimum, and **temporarily** servicing only one appliance or fixture?
 - Ensure extension cord is plugged directly into receptacle. Extension cords should never be used plugged end-to-end; use the proper length cord.
 - If extension cords are used, ensure cords are not running through walls, ceiling or doors?



4. Are cord guards provided across an aisle or other passageway to prevent tripping?
5. Is the electrical equipment grounded (three-prong plugs) or double insulated?
 - Are 3-prong plugs only used for 3-prong receptacles, and never altered to fit into an outlet?
6. Are Ground Fault Circuit Interrupters in place where electrical outlets are in use within 6 feet of water?
Ensure GFCI's are working properly by using the "TEST" button.
7. Are all electrical boxes, panels and receptacles covered to protect against electrocution?
8. Are control switches, circuit breakers and electrical panels free of obstructions?
These items must be accessible at all times.
9. Are high voltage control panels and access doors posted?

Seismic Safety

1. Do shelves used for chemical storage have seismic restraining devices (e.g. lip, wire or bungee cord) installed to prevent chemicals from falling? Is all valuable or hazardous equipment seismically anchored?

External links for securing lab instruments & equipment:

[Earthquake Restraint System for Optical Tables](#)

[Securing Your Workplace](#)

2. Are cabinets, chemical shelves and furniture over 42 inches in height braced against walls to prevent their falling over in the event of an earthquake?
3. Is overhead storage of heavy objects minimized and restrained?

Administrative

(Note: these training requirements must be met by supervisors to satisfy their personal regulatory obligations and reduce their liability)

1. Per UCOP [policy](#) the Fundamentals of Laboratory Safety orientation is required for all new UCSB lab workers before lab access is granted. Verify everyone has attended either the Initial course or the refresher (this is required annually after completing the *Initial* training) training.
2. Ensure everyone has gone through the [Laboratory Hazard Assessment Tool](#) (LHAT)? The LHAT provides a summary report of hazards present in the laboratory and the PPE recommended for laboratory workers. The LHAT must be updated as hazards change, and at least once every 12 months, irrespective of changes to hazards or personnel.
3. Has each lab member completed the [Training Needs Assessment](#) form and kept on file for review? Supervisors are responsible for conducting and documenting the laboratory training needs assessment per policy.

Any questions, please contact hgacu@ucsb.edu