UC Irvine
Environmental Health & Safety

Reines Hall H-3 Storage Room Guidelines

REFERENCE GUIDE

Issued: November 2025

This reference guide applies to users of the Reines Hall H-rooms located on Floors 2-5. The rooms are designed to store hazardous material, and their use will enhance overall safety of lab operations within the building and aid in the ongoing management of Maximum Allowable Quantities (MAQ) on campus. Each room is designed as an H-3 occupancy per the 2025 California Building Code (CBC). Laboratories will share a room with all other laboratories on the same floor, where they can store a significant amount of flammable liquids (except heptane and nonane), up to the storage capacity of the room, if the rules and guidelines outlined by this document are followed.

Definitions

Control Area: Spaces within a building where quantities of hazardous materials not exceeding the MAQ per control area are stored, dispensed, used or handled.

Combustible Liquid: A liquid having a closed cup flash point above 100°F (38°C). Combustible liquids are further categorized into the following groups:

- Class II: Liquids having a flash point at or above 100°F (38°C) and below 140°F (60°C).
- Class IIIA: Liquids having a flash point at or above 140°F (60°C) and below 200°F (93°C).
- Class IIIB: Liquids having a flash point at or above 200°F (93°C).

Flammable Liquid: A liquid having a closed cup flash point below 100°F (38°C). Flammable liquids are further categorized into a group known as Class I liquids. The Class I category is subdivided as follows:

- Class IA: Liquids having a flash point below 73°F (23°C) and having a boiling point below 100°F (38°C).
- Class IB: Liquids having a flash point below 73°F (23°C) and having a boiling point at or above 100°F (38°C).
- Class IC: Liquids having a flash point at or above 73°F (23°C) and below 100°F (38°C).

Flammable Material: A material capable of being readily ignited from common sources of heat or at a temperature of 600°F (315°C) or less.

Hazardous Material: Those chemicals or substances which are physical hazards or health hazards as defined by the 2025 California Fire Code (CFC), whether the material is in usable or waste conditions. Hazardous materials are categorized as either a Physical Hazard or a Health Hazard (e.g., some examples of Physical Hazard – Flammable, Oxidizer, or Water-reactive. Health Hazard – Highly Toxic or Corrosive).

High Hazard Group H: Occupancy type including the use of a building or structure, or a portion thereof, that involves the manufacturing, processing, generation, or storage of materials that

constitute a physical or health hazard in quantities in excess of those allowed in control areas, based on the MAQ limits for control areas set forth in the CFC and CBC.

High Hazard Group H-3: Buildings and structures containing materials that readily support combustion or that pose a physical hazard.

Maximum Allowable Quantity (MAQ): The maximum amount of hazardous material allowed to be stored or used within a control area inside a building or outdoor control area. The MAQ per control area is based on material state (solid, liquid or gas) and material storage or use conditions. The MAQ within a building must be separated by control areas. These control areas are 1-hour fire barriers for floors basement through 3rd and 2-hour fire barriers 4th floor and higher. The maximum of each hazardous material is defined in CFC Tables 5003.1.1 (1), 5003.1.1 (2), 5003.1.1 (3), and 5003.1.1 (4). Most UC Irvine rooms with hazardous materials are classified as B (Business) laboratories and require MAQs not to be exceeded per the referenced CFC tables.

Responsible Person(s): Designated personnel who have access to the gas detection system alarm panel and are authorized to deactivate the visual alarm. Such persons include the Building Manager, Environmental Health and Safety (EHS) School Coordinator, designated Facilities Management personnel, and designated lab personnel.

Storage of Hazardous Material: The keeping, retention, or leaving of hazardous materials in closed containers, tanks, cylinders, or similar vessels; or vessels supplying operations through closed connections to the vessel.

Used (Material): Placing a material into action, including solids, liquids, and gases.

General Requirements

The H-3 rooms on floors 2-5 will be shared by labs residing on each respective floor. Each lab group will receive one (1) key to access the room on their floor and must manage access accordingly. Only trained and authorized personnel are allowed access. The rooms shall be used for storage only. Dispensing and use of hazardous material within the rooms is strictly prohibited.

The rooms shall not be used to store or collect hazardous waste and are designated only for the storage of flammable liquids such as acetone, hexanes, ethyl acetate, ethanol, and 2-propanol. For a full list of acceptable chemicals, refer to Appendix A of this guide. Exceptions include heptane and nonane due to limitations of the gas detection system. Heptane and nonane must be stored within lab spaces, ensuring that the MAQ for flammable liquids in control areas is not exceeded. Inventory of flammable liquids in control areas should always be maintained at or below 90%.

Each room is equipped with four (4) storage racks with which sections will be assigned to each lab group based on need. The maximum container size that can be stored in the room is 20 liters (5 gallons). All 20-liter drums shall be stored on lower shelves. In general, larger/heavier containers should be stored on lower shelves and smaller/lighter containers should be stored on higher shelves. All containers that are less than 4 liters shall be stored within additional secondary containment. Containers shall not be stored on the floor.

Corridors within the building must remain free of flammable material and other obstructions.

H-rooms should always be equipped with a Class ABC fire extinguisher and a spill kit with necessary supplies (See Spill Response Guidelines) within the room. Ensure that there is always an appropriate absorbent sock available to place in front of the door if necessary.

Responsibilities

Principal Investigators (PIs):

- Be trained in the usage of the H-room and ensure that all lab personnel are also trained.
- Maintain accurate chemical inventory.
- Ensure that no materials incompatible with flammable liquids are stored in the H-room.
- Be trained in emergency procedures outlined in this document and ensure that all lab personnel are also trained.
- Maintain spill kit in the H-room.

Lab Personnel:

- Be trained in the usage of the H-room.
- Maintain accurate chemical inventory.
- Ensure that no materials incompatible with flammable liquids are stored in the H-room.
- Be trained in emergency procedures outlined in this document.
- Keep H-room well organized and clean.
- Ensure containers are not stored on the floor.
- Use secondary containment for containers less than 4 liters (1 gallon).
- Do not dispense flammable liquids inside the H-room.

Building Manager:

- Be trained in emergency procedures outlined in this document.
- Be trained on the gas detection system.
- Communicate with users if the room cannot or should not be entered.
- Coordinate spill response communications with EHS.
- Coordinate repair work with Facilities Management.

Environmental, Health, and Safety (EHS):

- Provide initial guidance/training.
- Provide guidance on H-room usage.
- Inspect the rooms at least annually.
- Provide emergency response support.
- Provide oversight of gas detection system maintenance and calibration and keep calibration log maintained inside the rooms.

Facilities Management:

- Support annual calibration of the gas detection sensors.
- Maintain gas detection notification system.
- Respond to losses of ventilation, power outages, and other electrical problems that may trigger an alarm.

Transporting Containers

Refer to UC Irvine's Transporting and Moving Chemicals Reference Guide for comprehensive guidance regarding the movement of hazardous material on campus. In summary:

- Always use a cart with at least 2" lip on all sides, bottle carrier, or other form of secondary containment when transporting containers from the H-room to the lab.
- PPE should be worn when handling hazardous material containers and moving through corridors on the same floor, but gloves should not come in contact with door handles.

Consider removing gloves once the containers are loaded onto the cart/carrier or leave one hand exposed.

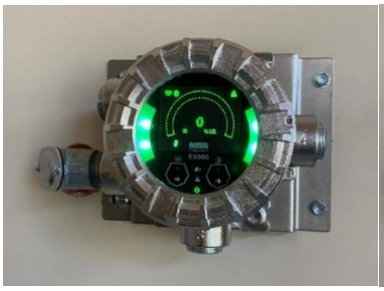
- Ensure that good lifting techniques are always followed.
- Use a step stool to reach higher shelves.
- Work together/use a buddy system whenever possible.

Gas Detection System

All H-rooms in Reines Hall are equipped with a gas detection system that is designed to alarm audibly and visually, provide notification to responsible persons and activate the emergency exhaust system upon detection of hazardous concentrations of flammable gas/vapor. The following describes how the system works and what to do if it activates:

- System Components
    - Alarm (Floors 2-5)– Green lights affixed to wall near the H-room door, and within the room, on each floor will activate audibly and visually when gas is detected at hazardous concentrations.
        - This will ramp up the exhaust system to bring hazardous gas/vapor concentrations down.
        - Audible alarm will stop as the hazardous gas/vapor concentration reduces to an acceptable level. DO NOT ENTER the room. The audible alarm will deactivate if the exhaust system successfully reduces the gas concentration to an acceptable level. If the audible alarm continues, call 911. *<u>Note</u>: The 3rd floor control panel will beep when the audible or visual alarm activates. This beeping is not an audible alarm that requires emergency action.*
        - Visual alarm will continue until it is acknowledged by a responsible person.
        - The alarm will only activate on the floor where gas is detected.

    - Gas Monitoring Display Panel (Floors 2-5) – Round silver display panel that lights up green next to H-room doors displays flammable gas concentrations within the room. It “sleeps” and may need to be tapped at the lower left to view the readout.




- Control Panel (3rd Floor Only) – Visual alarms must be acknowledged by a responsible person via the control panel on the 3rd floor. Only authorized personnel have access to this panel, which includes the Building Manager, EHS School Coordinator, Facilities Management, and designated responsible lab personnel.
    - The control panel will beep any time an alarm activates on any floor.

- *Note: The gas detection system operates on an emergency generator and will continue to monitor for flammable vapors during a power outage.*

Emergency Procedures

Refer to UC Irvine's Emergency Procedures. See below for additional considerations as they relate to the H-rooms. See summary of contact information and reporting requirements on Page 7.

Alarm Activation:

- When the alarm activates audibly and visually:
    - If inside the room, evacuate immediately, ensuring the door closes behind. Do not re-enter the room unless the ***audible*** alarm has deactivated, it is safe to do so, and you are comfortable cleaning the spill. Refer to Spills section of this guide.
    - If outside the room, do not enter the room unless the ***audible*** alarm has deactivated, it is safe to do so, and you are comfortable cleaning the spill. Refer to Spills section of this guide.
    - Call 911 if the audible alarm does not deactivate.
    - The visual alarm will need to be acknowledged by a responsible person via the control panel once it is safe to resume normal operations.
- In the event that anyone is injured, incapacitated, or trapped in the room, call 911 immediately.
- Notify EHS at (949) 824-6200 of any spills or other recordable incidents as soon as possible.

Spills:

- For all spills, if it is safe to do so, put a spill sock at the outside of the door to avoid leaking of liquid into the hallway.

- Refer to UC Irvine's Spill Response Guidelines and the Hazardous Materials Incidents page for appropriate spill response procedures.
- If the alarm activates while the spill cleanup is in progress, evacuate the room, close the door, and call 911 if audible alarm remains active.

Fire:

- If a fire is noticed in the room, and the fire alarm did not go off, activate the fire alarm by pulling down on the nearest fire pull station, then evacuate the building.
- All fire extinguishers, safety showers/eyewashes, and fire alarm pull stations are located in the same locations on each floor. See pictures below for guidance.

Fire alarm pull stations are located on every floor next to the stairwell and men's bathroom, around the corner from the elevators.

Power Outage:

- Secure any containers being handled at the time, evacuate the room, and ensure the door closes.
- Contact Facilities Management at (949) 824-5444. See emergency procedures for unplanned power outages.
- Backup power should activate emergency lights and allow for evacuation until the outage can be resolved.

Seismic Event:

- Secure any containers being handled at the time, evacuate the room, and ensure the door closes.
- Follow general emergency procedures for seismic events.

Loss of Ventilation:

- Immediate Action: Evacuate room, ensure door closes, and notify Facilities Management at (949) 824-5444.
- Long Term: Repairs to the ventilation system may be needed and the room ventilation may not work for an extended period of time.
    - Containers may be transported in and out of the room, but a buddy system must be used.
    - Do not enter the room or transport chemicals alone.
    - Ensure adequate signage is placed during unusual circumstances.

Medical Emergency:

- If it is safe to evacuate the room, evacuate, and call 911.
- Follow the lab's internal emergency and notification procedures.
- Report injury/incident to EHS at 4x6200 or online as soon as possible.

Emergency Contact and Reporting Summary

Emergency Condition	Contact	Reporting Requirement
Audible Alarm Continues	911	Report to EHS (949-824-6200) as soon as possible
Spill	911 or EHS (949-824-6200)	Report to EHS (949-824-6200) as soon as possible
Fire	911	Report to EHS (949-824-6200) as soon as possible
Power Outage	Facilities Management (949-824-5444)	Report to Facilities Management
Loss of Ventilation	Facilities Management (949-824-5444)	Report to Facilities Management
Medical Emergency	911	Complete incident report online as soon as possible

References

- 2025 California Building Code
- 2025 California Fire Code
- Spill Response Guidelines
- UC Irvine Emergency Procedures
- Transporting and Moving Chemicals Reference Guide

If you have any questions related to the requirements outlined in this reference guide, please contact EHS at (949) 824-6200 or email safety@uci.edu.

Appendix A
Reines Hall H-3 Rooms – Acceptable Materials

H-3 rooms are designed to store materials that readily support combustion or that pose a physical hazard. The Reines Hall H-rooms will be used only for Class I, II, and IIIA liquids, **except for heptane, nonane, water-reactive and pyrophoric material, and controlled substances. Some materials that are also toxic or highly toxic may also be restricted.** Ensure that all peroxide forming chemicals are labeled and tested according to the Peroxide-Forming Chemicals Reference Guide. Common acceptable materials include, but are not limited to:

Acetal	Diethyl Chlorophosphite	Isopropyl Alcohol
Acetaldehyde	Diethyl Ether	Isopropyl Nitrate
Acetol	Diethyl Sulfide	Isopropyl Sulfide
Acetone	Diethylsilane	Ligroine
Acetonitrile	Diisopropyl Ether	Methallyl Alcohol
Acetyl Chloride	Diisopropylamine	Methallyltrimethylsilane
Acetyltrimethylsilane	Dimethoxymethane	Methanol
Acrolein Diethyl Acetal	Dimethyl Carbonate	Methoxytrimethylsilane
Acrolein Dimethyl Acetal	Dimethyl Carbonate	Methyl Acetate
Allyl Mercaptan	Dimethyl Sulfide	Methyl Crotonate
Allyl Methyl Carbonate	Dimethylethoxysilane	Methyl Isovalerate
Allyl Methyl Sulfide	Dipropylamine	Methyl Methoxyacetate
Benzene	Ethanethiol	Methyl Pivalate
Benzotrifluoride	Ethanol	Methyl Propargyl Ether
Bis(dimethylamino)methylsilane	Ethyl Acetate	Methyl Propiolate
Bromoethane	Ethyl Crotonate	Methylcyclohexane
Bromotrimethylsilane	Ethyl Ether	Methyldiethoxysilane
Butyl Acetate	Ethyl Formate	Methylenecyclopentane
Butyl Alcohol	Ethyl Isobutyrate	Methylphenylsilane
Butyl Methyl Ether	Ethyl Propiolate	Methyltriethoxysilane
Carbon Disulfide	Ethyl Propionate	Nitromethane
Chloro(chloromethyl)dimethylsilane	Ethyl trifluoroacetate	Octane
Chlorobenzene	Ethyl Vinyl Ether	Pentafluorobenzene
Chlorocyclopentane	Ethyl Vinyl Sulfide	Pentane
Crotonitrile	Ethylbenzene	Phenylacetylene
Crotyl Alcohol	Ethylcyclohexane	Phenylthiotrimethylsilane
Cumene	Fluorobenzene	Pinacolone
Cyclohexane	Glycerin	Propionaldehyde
Cyclohexene	Heptanal	tert-Butyl Acetate
Cyclohexylacetylene	Hexafluorobenzene	tert-Butyl Methyl Ether
Cyclooctane	Hexamethyldisilane	tert-Butylbenzene
Cyclooctene	Hexamethyldisilazane	Tetrahydrofuran
Cyclopentane	Hexamethyldisiloxane	Tetrahydrothiophene
Cyclopentanone	Hexanal	Thioacetic Acid
Cyclopentyl Methyl Ether	Hexanes	Toluene
Cyclopropyl methyl ketone	Isobutyryl Chloride	Trimethoxymethane
Diethoxymethane	Isopropenyl Acetate	Vinylcyclohexane
Diethyl Carbonate	Isopropyl Acetate	Xylenes

Please contact EHS if you are unsure if a chemical that is not listed is acceptable.