

Refrigerators, Freezers, & Environmental Chambers

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Research Safety

Office of Research

UNIVERSITY OF GEORGIA

I. Purpose & Scope

This document provides an overview of the University's requirements and recommendations for the safe use of laboratory refrigerators, freezers, and environmental chambers meant primarily for reagent and sample storage within laboratory areas. This document briefly covers personal protective equipment and routine maintenance. Please note that individual research areas may have additional requirements not detailed in this document.

II. General Safety Guidelines

A. Food/Drink

Food and drink intended for human consumption shall not be stored inside a laboratory refrigerator, environmental chamber, or freezer for any reason. Every laboratory unit will have a sign similar to what is shown in Appendix A of this document posted on the door. Please contact Research Safety if you need any of these postings.

B. Cleaning/Disposal

All refrigerators and freezers are to be cleaned out on a regular basis by the lab group; old samples and reagents should be discarded or disposed of through the Environmental Safety Division's Hazardous Waste group for chemicals. For non-chemical sample disposal contact the Office of Research Safety for instructions. One of the most common safety concerns found in laboratories are abandoned samples and reagents left in refrigerators, freezers, and cold rooms when lab personnel depart from UGA. Time and effort spent determining how to properly dispose of "old items" is wasteful.

Additionally, units should be defrosted regularly so as not to compromise the functioning of the unit. Accommodations will need to be made to prevent slip hazards around the unit as the ice melts. If there is a reason to believe that the melt water is contaminated in any way please contact Research Safety or Environmental Safety prior to disposal.

In the event of a lab closeout, or when refrigerators/freezers are sent to salvage, laboratory personnel shall clean out the refrigerators/freezers and decontaminate

them. Failure to properly decontaminate a unit could result in pickup delays from Support Services and/or a fee being charged to the department if decontamination has to be completed by Research Safety. A signed decontamination notice should be posted on each piece of equipment prior to being transferred to another lab on campus or being sent to salvage. Further instructions are outlined in the Laboratory Equipment Decontamination Guidelines.

C. Personal Protective Equipment

Standard laboratory PPE such as lab coats, gloves, and safety glasses should be worn when accessing items in refrigerators, freezers or environmental chambers. Stored items may have shifted, or retrieved items may be inadvertently dropped or other items pushed off a shelf during the retrieval of necessary items.

Additionally, cryogenic gloves are required when retrieving samples or other items from a -80°C freezer. Nitrile gloves are not appropriate substitutes for this purpose.

III. Types of Refrigerators and Freezers

A. General Purpose (Household-Type) Unit

- These units are easily identifiable as they will usually have a light or thermostat switch readily noticeable when you open the refrigerator or freezer.
- General purpose units are not appropriate for the storage of flammable materials or unstable chemicals. This includes samples dissolved in a flammable solvent. Vapors from these types of substances can build up within the unit and create a fire hazard.
- General purpose units are permitted for the storage of non-flammable aqueous solutions or other non-flammable or non-explosive material only.
- A yellow sign as shown in Appendix B of this document should be placed on each of these units. Please contact Research Safety if you need any of these signs.

B. Intrinsically-Safe Unit

- These units will usually have a placard or sign highly visible on the front of the unit; the sign should clearly indicate that this unit is acceptable for the storage of flammable materials, both liquid and solid.
- These units have no interior electrical components (e.g., lights) that can provide a source of ignition.
- Uninterruptable power supplies and automatic generators should be considered for freezers and refrigerators that are used to store unstable compounds.

C. Explosion Proof Unit

- These units are designed to prevent ignition of flammable vapors or gases inside the unit but also to protect items in the unit from potentially flammable atmospheres outside of the unit.
- These units may be necessary in solvent dispensing rooms or other locations

where a flammable atmosphere may develop during work. The explosion-proof units also require special wiring rather than a simple plug-in power cord. Please consult with Research Safety or Fire Safety if you feel that you need one of these units.

- Uninterruptable power supplies and automatic generators should be considered for freezers and refrigerators that are used to store unstable compounds.

D. Environmental Chambers

- Most environmental chambers have the same restrictions as general purpose (household) refrigerators and freezers. They should not be used for the storage of flammable and/or unstable materials. They must have a sign posted on the door as shown in Appendix B.
- Environmental chambers are closed systems that can lead to the buildup of potentially harmful vapors. For this reason, the storage or long-term use of corrosive and toxic materials are not recommended. Doing so can damage the room and pose a hazard to the user.
- Mold is a common problem in these areas. If you notice any leaks or condensation that could lead to mold concerns, please contact Research Safety or Environmental Safety.
- Restrict the use of paper or cardboard in these rooms or if such materials are needed, cover them in plastic.
- Dry ice and liquid nitrogen should not be stored in these chambers; Displacement of air in the room can create an asphyxiation hazard.

IV. Other General Considerations

- Use waterproof tape and markers to label items being stored for long periods of time in a refrigerator or freezer.
- Storage trays, racks, or secondary containment is recommended to minimize the distribution of material in the event of a leak. Chemical storage within these units is expected to adhere to the proper segregation of chemical hazard classes.
- If applicable, locks should be used to secure refrigerator and freezer contents. Examples of items that should always remain secure include radioisotopes, controlled substances, and biohazardous material.
- Refrigerators and freezers should be placed in the lab at locations so as not to impede egress in the event of an emergency.
- Never place uncapped containers of chemicals or biohazardous material in a refrigerator, environmental chamber or freezer. Coverings of aluminum foil, corks, or glass stoppers are not appropriate.
- Refer to the UGA Biosafety Manual for questions regarding the use of freezers storing biological samples.

V. Contacts

Environmental Safety Division: 706-542-5801
Office of Research Safety: 706-542-5288

VI. References

Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards,
National Research Council, 2011

NFPA 45: Standard on Fire Protection for Laboratories, National Fire Protection Agency,
2015

University of California – Center for Laboratory Safety

Appendix A: Lab Use Only Label



Appendix B: No Flammable Material Storage Label



CAUTION
DO NOT STORE
FLAMMABLE MATERIALS
IN THIS BOX