Refrigerator and Freezer Purchasing Procedure for UCI Laboratories

Summary: This procedure outlines the campus guidelines for the purchasing of refrigerators or freezers for use in campus laboratories.

1. Program Description
This refrigerator and freezer purchasing procedure was developed to assist the campus community in purchasing the appropriate refrigerator or freezer for their particular use.

2. Scope
This procedure applies to all UC Irvine owned or operated facilities.

3. Definitions
Adequate Separation: A distance of 8 linear feet between domestic refrigerators or freezers and flammable liquid or gaseous reagents in a laboratory setting.

Designated Clean Area: Follow EH&S clean area guidelines: https://www.ehs.uci.edu/programs/labres/CLEAN_AREA_PROCEDURE.pdf

Domestic Refrigerator or Freezer: Standard household refrigerator or freezer. These units are generally sold at department stores and other retail outlets and are only approved for the storage of food or storage of non-reactive or non-flammable reagents and preserved biological specimens.

Flammable reagents: A reagent that has a flash point of 80 o F or less.

Flammable Material Storage Refrigerators and Freezers: Laboratory refrigerators or freezers approved for the storage of flammable or reactive reagents. These units are generally sold through laboratory equipment supply outlets such as Fisher Scientific or VWR.

General-Purpose Lab Refrigerators or Freezers: Laboratory refrigerators and freezers approved for the storage of nonvolatile reagents and nonvolatile biological specimens. These units are generally sold through laboratory equipment supply outlets such as Fisher Scientific or VWR.

Laboratory Setting: For the purpose of this procedure, a laboratory setting is defined as a room where flammable or reactive chemicals are used or hazardous materials are stored.

Personal Use: For the purpose of this procedure, personal use is defined as storing staff lunches and other personal items in a refrigerator or freezer. Personal use refrigerators must be purchased with employee personal contributions only.

Reactive reagents: For the purpose of this procedure, the term reactive reagent is defined as a material, which will spontaneously or vigorously reacts with air or water.

4. Responsibilities
All UC Irvine faculty, staff and students are responsible for compliance with this program as it relates to operations under their control or activities in which they participate.

5. Specific Program Components
5.1 What type of refrigerator or freezer will I need to purchase?

<table>
<thead>
<tr>
<th>USAGE</th>
<th>TYPE</th>
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</thead>
<tbody>
<tr>
<td>I need a refrigerator or freezer to store only food for my department's general use OUTSIDE OF THE LAB ENVIRONMENT.</td>
<td>Buy a domestic household type unit with an “Energy Star” rating.</td>
</tr>
<tr>
<td>I need a refrigerator or freezer to store nonvolatile reagents or nonvolatile biological specimens INSIDE A LAB ENVIRONMENT.</td>
<td>Buy a general-purpose lab refrigerator or freezer, chromatography or pharmacy refrigerator, or ultralow freezer.</td>
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<tr>
<td>I want to purchase (or relocate) a domestic refrigerator or freezer to store non-reactive reagents or preserved biological specimens INSIDE A LAB ENVIRONMENT with adequate separation-see definition- from storage of LIQUID FLAMMABLES.</td>
<td>The purchase of a domestic refrigerator or freezer may be approved for purchase by EH&amp;S on a case-by-case basis. Submit the purchase requisition for EH&amp;S review. I acknowledge, I understand and will follow all UCI safety procedures as outlined in this procedure, if EH&amp;S approves the purchase.</td>
</tr>
<tr>
<td>I need a refrigerator or freezer to store flammable or reactive reagents.</td>
<td>Buy a flammable materials storage refrigerator or freezer.</td>
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5.2 Background
5.2.1 Fires and explosions can and do occur in either general-purpose laboratory or ordinary domestic refrigerators or freezers when these types of appliances are used to store volatile or flammable materials. The safety hazard is best described as follows. Domestic or general-purpose laboratory refrigerators and freezers can contain up to nine arcing points in the storage compartment. Each produces electrical arcs or sparks during the normal course of operations. The arc produced at the arc points will ignite flammable vapors emitted from damaged or unsealed containers. In addition, the compressor and its circuits are typically located at the bottom of the domestic unit where vapors from flammable liquid spills or leaks in the storage compartment may easily accumulate. The compressor unit for domestic units is not vapor-proof; therefore, arc points inside the compressor pose the identical hazard as described above. In contrast, all commercial laboratory refrigerators and freezers are equipped with fully vapor sealed or semi-sealed compressors.
5.3 Purchasing Procedure

5.3.1 University funds, regardless of source, may not be used to purchase personal use refrigerators/freezers. Personal use refrigerators/freezers must be purchased with employee personal contributions only. "Energy Star" rated equipment must be purchased.

5.3.2 For the purpose of this procedure, a laboratory setting is defined as a room where flammable or reactive chemicals are used or hazardous materials are stored.

- Domestic refrigerators or freezers are approved for food storage within the “designated clean area” in the lab environment. A “clean area” sign must be affixed to the front door of the refrigerator or freezer in addition to the designated clean area.
- Domestic refrigerators or freezers may be approved on a case-by-case basis and requires prior approval from EH&S before the purchase order is placed with the vendor. If such an approval is granted, all flammable liquids will not be used or stored within 8 feet of the unit, because, the compressor is not vapor-proof and poses a potential safety hazard.
- General-purpose lab refrigerators or freezers, chromatography or pharmacy refrigerators and ultralow freezers are approved for the storage of nonvolatile reagents and nonvolatile biological specimens.
- Flammable materials storage refrigerators and freezers are approved for the storage of flammable or reactive reagents.
- This procedure also applies to departments loaning, renting or receiving gifts of this type of equipment from outside sources and all incoming P.I.'s who transfer their own equipment to UC Irvine.