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EH&S Fact Sheet
Environment, Health and Safety Information for the Berkeley Campus

No. 31
Revised 10/31/03

Storing Flammable Liquids in Refrigerators and Freezers

It is unsafe to store flammable liquids in domestic refrigerators or freezers. Explosions, injuries, and costly laboratory fires have resulted from this dangerous practice. There are three types of refrigerators used in campus laboratories to prevent the ignition of flammable vapors:

- "laboratory-safe" or "flammable material"
- "explosion-proof"
- previously modified ("desparked") domestic models

"Laboratory-safe" or "flammable material" refrigerators

Flammable material refrigerators and freezers are designed to prevent ignition of flammable vapors inside the storage compartment and should be purchased whenever a refrigerator is needed to store flammable liquid. A flammable liquid is defined by the fire code as having a flash point of less than 100 °F (38°C). Some examples of common flammable liquids are listed at the end of this Fact Sheet.

All the electrical components in this type of refrigerator are outside the refrigerator, and the compressor is sealed or located at the top of the unit. Flammable material refrigerators also may incorporate design features such as thresholds, self-closing doors, magnetic door gaskets, and special inner shell materials that control or limit the damage should a reaction occur within the storage compartment. A label stating "Flammable Materials Refrigerator: Keep fire away" can identify such refrigerators. The refrigerators must be U.L. Listed as Flammable Material Storage Refrigerators. Ultra low freezers (less than -40°F) generally cannot be approved for storage of flammable materials.

"Explosion-proof" refrigerators

Explosion-proof refrigerators are designed to prevent ignition of flammable vapors or gases that may be present outside the refrigerator. This type of refrigerator must be used in locations such as solvent dispensing rooms, where a flammable atmosphere may develop at some time *in the room*. Explosion-proof refrigerators have very limited use on campus and require special hazardous-location wiring rather than simple cord-and-plug connections. Please contact the Campus Fire Marshal at EH&S (642-3073) if you believe you have a need for an "explosion-proof" refrigerator.

Modified ("desparked") domestic refrigerators

Some campus laboratories contain older domestic refrigerators that were modified ("desparked") by campus refrigeration technicians. However, because the desparking process does not isolate all the possible sources of ignition, the California State Fire Marshal no longer allows desparking of domestic refrigerators. Using previously modified refrigerators is acceptable if the laboratory inspects them regularly for defects such as frayed wiring. Defective refrigerators should not be used to store flammable materials.

If you are unsure what type of refrigerator you have in your laboratory or what type you should purchase, contact EH&S (642-3073).

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Regardless of type, every laboratory refrigerator and freezer must be clearly labeled to indicate whether it is appropriate for the storage of flammable materials. If your laboratory refrigerator is unlabeled, it is probably a domestic refrigerator that needs the label below. Contact EH&S (642-3073) to request the following sticker:

Laboratory refrigerators should also be labeled "No Food" or "Food Only," depending on their use. Food should never be stored or consumed near chemicals.

Disposal of unwanted refrigerators

Work with your department equipment custodian to dispose of broken or unwanted refrigerators. All biological, radiological, and chemical hazards must be removed from the refrigerator. If the refrigerator was used to store radioactive isotopes, it should be cleaned and surveyed. The Radiation Safety Team of EH&S should be contacted to confirm that it is clean. Excess, Surplus and Salvage (642-5330) will pick up refrigerators if there are no visible hazards or hazardous labels. There is a recharge for recycling the refrigerator and the freon refrigerant. The freon refrigerant must be collected and removed because it is an EPA regulated environmental pollutant. There may be a recharge for collecting the freon.

Safe storage of other hazardous materials

Flammable liquids may never be stored with strong oxidizers or acids, and compressed gases should not be stored in enclosed spaces like refrigerators. For more information about safe storage of hazardous materials, please refer to the EH&S booklet entitled "Safe Storage of Hazardous Materials" at http://ehs.berkeley.edu/images/ehs/pubs/chemicalstoragebooklet.pdf.

For more information on using refrigerators and freezers for storing hazardous materials, contact EH&S (642-3073).

Common Laboratory Solvents

Do not store these flammable liquids in domestic refrigerators. Flammable liquid has a flash point <100˚F/ 38˚C.

Chemical	Flash point (˚F)	Chemical	Flash point (˚F)
Acetone	4	Methanol	54
Acetonitrile	42	Petroleum Ether	20
Benzene	12.2	Propyl Alcohol	74
Butanol	84	Pyridine	68
Cyclohexene	10	Tetrahydrofuran	6
Dioxane	54	Tetramethyl-ethylenediamine	50
Ethyl Acetate	24	Toluene	40
Ethyl Alcohol	55	Triethylamine	20
Ethyl Ether	-49	Xylene	84
Hexane	-7		
Isopropanol	53		