

Cold-Storage of Flammable Liquids

Purpose and Scope: This guideline describes methods for cold-storage of flammable liquids. This guideline applies to all Northern Arizona University personnel.

1. Responsibilities

1.1. Principal Investigators (PI) and Lab Managers

PIs and lab managers shall ensure that this guideline is read and implemented in their work areas and labs. PIs and/or lab managers will notify the Office of Regulatory Compliance (ORC) of cold-storage of flammable liquids.

2. Procedure

2.1. Flammable liquids cannot be store in lab *refrigerators, unless:

- 2.1.1. The refrigerator is specifically designated as a flammable materials storage refrigerator which complies with National Fire Protection Association (NFPA) 45, and is Underwriter's Laboratory (UL) listed, or
- 2.1.2. The refrigerator is specially designed as being an explosion-proof refrigerator and complies with OSHA CFR29 1910.307 and is UL listed for Class 1, Groups C and D hazardous locations.
- 2.1.3. Explosion proof refrigerators require Office of Regulatory Compliance (ORC) inspection and approval.

2.2. Flammable liquids cannot be stored or used in *cold rooms, unless:

- 2.2.1. The cold room's electrical and refrigeration equipment is specially designed as being explosion-proof. The unit must comply with OSHA CFR29 1910.307 or UL for Class 1, Groups C and D hazardous locations, and
- 2.2.2. The room must be mechanically ventilated, providing 100% outside air, at an exhaust rate of at least 6 changes per hour at the point of use.
- 2.2.3. These rooms require design approval from ORC prior to installation or construction.



2.3. *EXCEPTION: A limited risk is associated with the small-quantity cold-storage of **ethyl, methyl, and isopropyl alcohols**. ORC will accept refrigerator or cold-room storage of these materials, provided:

- 2.3.1. The quantity in a container does not exceed 500ml, and
- 2.3.2. The liquid is stored in a tightly sealed container with 25% of the bottle empty (for vapor expansion), and
- 2.3.3. There is a sealed secondary containment, using a non-breakable container.
- 2.3.4. Only two containers are allowed per cold-storage area.
- 2.3.5. This exception **DOES NOT APPLY** to ethers or other flammable liquids.