# REFRIGERATION / FREEZING OF FLAMMABLE LIQUIDS

* Flammable liquids must **never** be stored in standard domestic refrigerators, freezers, or cold rooms
  + Vapors from the stored chemicals can accumulate over time and come in contact with an electrical spark, thus creating a powerful explosion
    - Sparks can occur with normal operations of these appliances such as when the thermostat, defrost timer, internal lighting unit, or the motor turns on and off
  + Even a small quantity of flammable liquid stored in a non-approved refrigerator or freezer can cause a large explosion
  + Explosions, injuries and costly laboratory fires have resulted from storing flammable liquids in domestic refrigerators or freezers



University of Vermont: Flammable liquids stored in a refrigerator resulted in an explosion.



University of Virginia:

A thermostat spark ignited flammable vapors.

* Flammable material refrigerators and explosion-proof refrigerators are designed to prevent ignition of flammable vapors and can be used for storage of flammable liquids
  + A flammable liquid is defined by OSHA 1910.1200 App B Physical Criteria as having **a flash point of not more than 93°C (199.4°F)**.
    - Review the Safety Data Sheet (SDS) for the flash point of liquids
* Flammable-safe refrigerators will be U.L. listed, and bear a label stating “FLAMMABLE STORAGE ‐ KEEP FIRE AWAY”
* Explosion proof refrigerators are constructed so that there are no sparks or static charges generated either inside or outside of the unit
  + These refrigerators are typically used in specialized locations such as solvent dispensing rooms
* Avoid storing flammable liquids with strong oxidizers or acids and provide suitable secondary containment
* Chill flammable liquids safely in an ice bucket prior to use rather than storing them in a standard domestic refrigerator

## COMMON LABORATORY SOLVENTS

**Do not store these flammable liquids in standard domestic refrigerators**

| **Chemical** | **Flash Point (0F)** | **Chemical** | **Flash Point (0F)** |
| --- | --- | --- | --- |
| Acetone | 4 | Isopropanol | 53 |
| Acetonitrile | 42 | Methanol | 54 |
| Benzene | 12.2 | Petroleum Ether | 20 |
| Butanol | 84 | Propyl Alcohol | 74 |
| Cyclohexene | 10 | Pyridine | 68 |
| Dioxane | 54 | Tetrahydrofuran | 6 |
| Ethyl Acetate | 24 | Tetramethylethylenediamine | 50 |
| Ethyl Alcohol | 55 | Toluene | 40 |
| Ethyl Alcohol (20%) | 97 | Triethylamine | 20 |
| Ethyl Ether | -49 | Xylene | 84 |
| Hexane | -7 |  |  |