Making Sense Out of Chemical Storage

One of the most critical elements of handling chemicals is proper storage. The requirements for safe storage of chemicals are outlined below:

The storage area should be posted with an appropriate sign and the chemicals must be in appropriate containers and correctly labeled.

Chemical compatibility must be determined to reduce the likelihood of hazardous reactions. The following steps should be followed when determining which chemicals can be stored together:

- Identify the chemical.
- Determine the Hazard Class of the chemical:
  - Toxic
  - Flammable
  - Reactive
  - Corrosive
  - Oxidizer
  - Low Hazard

Segregate the chemicals according to the above classifications. If there is a potential for hazardous interactions within a specific class then further separation is needed.
Label the area for each class of chemical.

- Highly toxic or carcinogenic chemicals should be ordered and stored in the smallest practical amount.
- Flammable or combustible liquids must be stored in approved containers, flammable material storage cabinets, or in properly designed under-hood storage areas. No more than 10 gallons of flammable liquids may be stored outside an approved flammable material storage cabinet. No more than a total of 70 gallons of flammable liquids may be stored in a lab. (This requirement is derived from NFPA 30 Flammable and Combustible Liquids)
- Water reactive chemicals should be located in a cool, dry area away from potential sources of water.
- Corrosives must be separated into acid and base subclasses. Large containers of corrosives should be stored on the lowest shelf or in special cabinets. Acids and bases must be separated from active metals and substances that can generate toxic gases upon contact.
- Nitric acid must be stored separately.
- Oxidizers must be separated from combustible and flammable chemicals as well as reducing agents.
- Compressed gas cylinders must be stored in well-ventilated areas where the temperature does not exceed 125° F. Cylinders must be secured in an upright position. Cylinders not in use should have the valve protection caps in place. Brackets for restraining cylinders are available from several vendors. The UAB

Maintenance Department will install brackets or chains for a cost.

Even properly stored chemicals will eventually deteriorate. A good rule of thumb is to dispose of any chemical more than 2 years old. Depending on the material and mode of storage some chemicals may be stored longer. However, several classes of chemicals undergo rapid changes and the following storage guidelines should be followed.

The following are particularly susceptible to peroxide formation and should be retained a maximum of *6 months after receipt or three months after opening* whichever occurs sooner (unless stabilized, in which case the six-month after opening rule will apply):

Cyclohexene
Cyclooctene
Diethyl ether
Isopropyl ether
p-Dioxane
Sodium amide
Tetrahydrofuran

The following may be retained a maximum of *12 months after receipt or 6 months after opening:*

Acrylonitrile
Butadiene
Chlorotrifluoroethylene
Tetrafluoroethylene
Vinyl chloride
Vinyl ethers
Vinylidene chloride

The following materials may be subject to peroxidization. They should be dated upon receipt and be kept *no longer than 24 months*.

Acetal
Acrylic acid
Chloroprene
Decahydronaphthalene (Decalin)
Diacetylene
Dicyclopentadiene (Tetralin)
Diethylene glycol dimethyl ether (Diglyme)
Dimethyl ether
Ethylene glycol
Methyl acetylene
Methyl methacrylate
Styrene diacetylene

Tetrahydronaphthalene
Vinyl acetate
Vinyl pyridine

Please contact OH&S for additional information.