

# Hazardous Material Storage

### General

- Do not store chemicals in alphabetical order, nor randomly without order.
- Segregate incompatible chemicals such as oxidizing acids and flammable solvents in separate locations to prevent inadvertent mixing of incompatible chemicals which can produce harmful gases/vapors, or fire and explosions. The chemical incompatibility matrices and tables presented later in this section provide recommended (optional) guidelines for segregating incompatible chemicals.
- Store hazardous materials away from heat and direct sunlight. Heat and sunlight may impact and degrade chemicals, deteriorate storage containers and labels.
- Do not store hazardous materials (except cleaners) under sinks.
- Ensure caps and lids are securely tightened on containers to prevent leaks and evaporation of contents.
- Use approved flammable storage lockers or flammable storage containers to store flammable and combustible liquids exceeding 10 gallons in one room. Flammable and combustible liquids kept in squeeze bottles and other secondary containers may be kept on counter and bench tops provided they do not exceed the 10 gallon limit and are kept in secondary containment.
- Store inorganic acids in corrosive or acid storage cabinets with corrosion resistant interior shelves, brackets, hinges, and other components. Flammable storage cabinets are not corrosion resistant and shall not be used for inorganic acid storage.
- Storage shelves and racks should have enough clearance space to allow the largest container to be removed and replaced without the need to tip the container. Tipping when moving containers may cause the contents to drip or leak.
- Install a Plexiglas lip or other similar method of preventing materials from falling off open storage shelves.
- Hazardous materials should not be stored higher than eye level, or directly on the floor.

### Refrigerators Used for Hazardous Material Storage

- Refrigerators used for storing flammable and combustible liquids will be specifically designed for that purpose, and designated as such. Do not use ordinary domestic refrigerators to store flammable liquids.
- Do not store food or drink for consumption in laboratory refrigerators. Label refrigerators used for storing chemicals, samples or media as follows: "Caution—Do Not Store Food or Beverages in This Refrigerator."

### Secondary Containment for Liquids

- Store liquid hazardous materials (including squeeze and wash bottles) in secondary containment. This is to minimize the impact and spread of spills resulting from broken/leaking containers. Secondary containment capacity must be 110% of the largest container or 10% of the aggregate volume of all containers, whichever is larger.
- Secondary containment is available in different materials which provide varying resistance to different chemicals. Use resources such as user knowledge or the information provided below to select the proper material.

### Chemical Incompatibility Matrices and Tables

Chemical incompatibility data are presented in Tables 1 and 2 below. These are recommended guidelines that may be used in combination with container labels, MSDS information, and user knowledge for storing and segregating chemicals. Environmental Health and Safety can assist with designing appropriate chemical storage.

**Incompatibilities by Hazard Class**

	Acids, inorganic	Acids, oxidizing	Acids, organic	Alkalis (bases)	Oxidizers	Poisons, inorganic	Poisons, organic	Water-reactives	Organic solvents
Acids, inorganic			<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Acids, oxidizing			<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Acids, organic	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	
Alkalis (bases)	<b>X</b>	<b>X</b>	<b>X</b>				<b>X</b>	<b>X</b>	<b>X</b>
Oxidizers			<b>X</b>				<b>X</b>	<b>X</b>	<b>X</b>
Poisons, inorganic	<b>X</b>	<b>X</b>	<b>X</b>				<b>X</b>	<b>X</b>	<b>X</b>
Poisons, organic	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>			
Water-reactives	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>			
Organic solvents	<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>	<b>X</b>			

**Suggested Chemical Storage Pattern**

<b>Inorganic</b>	<b>Organic</b>
Sulfur, Phosphorus, Arsenic, Phosphorus Pentoxide	Alcohols, Glycols, etc. (store flammables in dedicated cabinets)
Halides, Sulfates, Sulfites, Thiosulfates Phosphates, etc.	Hydrocarbons, Esters, etc. (store flammables in dedicated cabinet)
Amides, Nitrates (not ammonium nitrate), Nitrites, etc.	Ethers, Ketones, etc. (store flammables in dedicated cabinet)
Metals, Hydrides (store away from water)	Epoxy compounds, Isocyanates
Hydroxides, Oxides, Silicates, etc.	Sulfides, Polysulfides, etc.
Arsenates, Cyanides (store above acids)	Phenol, Cresols
Sulfides, Selenides, Phosphides, Carbides, Nitrides	Peroxides, Azides, etc.
Manganates, Chromates, Permanganates, Borates	Acids, Anhydrides, Peracids, etc.
Chlorates, Chlorites, Perchlorates, Peroxides, Perchloric acid	Miscellaneous
Acids, except nitric. (store acids in dedicated cabinets)	Miscellaneous (Nitric Acid)

**Suggested Storage Time Limits for Common Peroxidizable Compounds**

**MOST DANGEROUS:** Discard after **3 months**.

Peroxide formation hazard during storage.  
 isopropyl ether  
 divinyl acetylene  
 vinylidene chloride  
 potassium metal  
 sodium amide

**DANGEROUS:** Discard after **one year**.

Peroxide formation hazard during storage and on concentration (i.e. distillation) of compound.

diethyl ether	dicyclopentadiene
tetrahydrofuran	diacetylene
dioxane	methyl acetylene
acetal	cumene
methyl isobutyl ketone	tetrahydronaphthalene
ethylene glycol dimethyl ether	cyclohexene
vinyl ethers	methylcyclopentane

**DANGEROUS:** Discard after **one year**.

Peroxide formation causes initiation of hazardous polymerization.

methyl methacrylate	chlorotrifluoroethylene
styrene	vinyl acetylene
acrylic acid	vinyl acetate
acrylonitrile	vinyl chloride
butadiene	vinyl pyridine
tetrafluoroethylene	chloroprene