Chemical Compatibility Chart

Below is a chart adapted from the CRC Laboratory Handbook, which groups various chemicals in to 23 groups with examples and incompatible chemical groups. This chart is by no means complete but it will aid in making decisions about storage. For more complete information please refer to the MSDS for the specific chemical. Examples of each group can be found on the next pages.

Group Number/Chemical Type		1 Inorganic Acids	2 Organic Acids	3 Caustics	4 Amines and Alkanolamines	5 Halogenated Compounds	6 Alcohols, Glycols, Glycol Ether	7 Aldehydes Acetaldehyde	8 Ketones	9 Saturated Hydrocarbons	10 Aromatic Hydrocarbons	11 Olefins	12 Petrolium Oils	13 Esters	14 Monomers Polymerizable Esters	15 Phenols	16 Alkylene Oxides	17 Cyanohydrins	18 Nitriles	19 Ammonia	20 Halogens	21 Ethers	22 Phosphorus	23 Acid Anhydrides
1	***Inorganic Acids***		x	x	x	x	x	x	x		x			x	x		x	x	x	x		x	x	x
2	***Organic Acids***	x		x	x			x							x		x	x	x	x			x	
3	***Caustics***	x	x				x	x	x					x	x	x	x	x	x		x			x
4	***Amines and Alkanolamines***	x	x			x		x	x					x	x	x	x	x	x					x
5	***Halogenated Compounds***	x		x	x							x			x			x						
6	***Alcohols, Glycols, Glycol Ether***	x						x							x		x				x			x
7	***Aldehydes Acetaldehyde***	x	x	x	x		x		x							x	x	x		x	x			x
8	***Ketones***	x		x	x			x												x	x			
9	***Saturated Hydrocarbons***																				x			
10	***Aromatic Hydrocarbons***	x																			x			
11	***Olefins***	x				x															x			
12	***Petrolium Oils***																				x			
13	***Esters***	x		x	x															x	x			
14	***Monomers Polymerizable Esters***	x	x	x	x	x	x									x	x			x	x	x		x
15	***Phenols***			x	x			x							x		x			x	x			
16	***Alkylene Oxides***	x	x	x	x		x	x							x	x		x	x	x				x
17	***Cyanohydrins***	x	x	x	x	x		x									x			x				x
18	***Nitriles***	x	x	x	x												x							x
19	***Ammonia***	x	x					x	x					x	x	x	x	x			x			x
20	***Halogens***			x			x	x	x	x	x	x	x	x	x	x				x		x	x	
21	***Ethers***	x													x						x			
22	***Phosphorus***	x	x	x																	x			
23	***Acid Anhydrides***	x		x	x		x	x							x		x	x	x	x				

X - Indicates chemicals that are incompatible and should not be stored together.

Group #	Name	Example	Incompatible Groups
1	Inorganic Acids	Hydrochloric acid Hydrofluoric acid Hydrogen chloride Hydrogen fluoride Nitric acid Sulfuric acid Phosphoric acid	2,3,4,5,6,7,8,10,13,14,16,17,18,19,21,22,23
2	Organic acids	Acetic acid Butyric acid Formic acid Propionic acid	1,3,4,7,14,16,17,18,19,22
3	Caustics	Sodium hydroxide Ammonium hydroxide solution	1,2,6,7,8,13,14,15,16,17,18,20,23
4	Amines and Alkanolamines	Aminoethylethanolamine Aniline Diethanolamine Diethylamine Dimethylamine Ethylenediamine 2-Methyl-5-ethylpyridine Monoethanolamine Pyridine Triethanolamine Triethylamine Triethylenetetramine	1,2,5,7,8,13,14,15,16,17,18,23
5	Halogenated Compounds	Allyl chloride Carbon tetrachloride Chlorobenzene Chloroform Methylene chloride Monochlorodifluoromethane 1,2,4-Trichlorobenzene 1,1,1-Trichloroethane Trichloroethylene Trichlorofluoromethane	1,3,4,11,14,17
6	Alcohols, Glycols, Glycol Ether	1,4-Butanediol Butanol (iso, n, sec, tert) Diethylene glycol Ethyl alcohol Ethyl butanol Ethylene glycol Furfuryl alcohol Isoamyl alcohol Methyl alcohol Propylene glycol Acrolein Butyraldehyde	1,7,14,16,20,23

Group #	Name	Example	Incompatible Groups
7	Aldehydes Acetaldehyde	Crotonaldehyde Formaldehyde Furfural Paraformaldehyde Propionaldehyde Acetone Acetophenone	1,2,3,4,6,8,15,16,17,19,20,23
8	Ketones	Diisobutyl ketone Methyl ethyl ketone Butane Cyclohehane	1,3,4,7,19,20
9	Saturated Hydrocarbons	Ethane Heptane Paraffins Paraffin wax Pentane Petroleum Ether Benzene	20
10	Aromatic Hydrocarbons	Cumene Ethyl benzene Naphtha Naphthalene Toluene Xylene	1, 20
11	Olefins	Butylene 1-Decene 1-Dodecene Ethylene Turpentine	1,5,20
12	Petroleum Oils	Gasoline Mineral Oil	20
13	Esters	Amyl acetate Butyl acetates Castor oil Dimethyl sulfate Ethyl acetate	1,3,4,19,20
14	Monomers	Polymerizable Esters Acrylic acid Acrylonitrile Butadiene Acrylates	1,2,3,4,5,6,15,16,19,20,21,23
15	Phenols	Carbolic acid Cresote Cresols Phenol	3,4,7,14,16,19,20
16	Alkylene Oxides	Ethylene oxide Propylene oxide	1,2,3,4,6,7,14,15,17,18,19,23
17	Cyanohydrins	Acetone cyanohydrin Ethylene cyanohydrin	1,2,3,4,5,7,16,19,23

Group #	Name	Example	Incompatible Groups
18	Nitriles	Acetonitrile Adiponitrile	1,2,3,4,16,23
19	Ammonia	Ammonium Hydroxide Ammonium Gas	1,2,7,8,13,14,15,16,17,20,23
20	Halogens	Chlorine Fluorine	3,6,7,8,9,10,11,12,13,14,15,19,21,22
21	Ethers	Diethyl Ether THF	1,14,20
22	Phosphorus	Phosphorus, Elemental	1,2,3,20
23	Acid Anhydrides	Acetic anhydride Propionic anhydride	1,3,4,6,7,14,16,17,18,19

Incompatible Groups:

Acidic and Alkaline

Spontaneously Combustible and Acidic

Acidic and Flammable

Acidic and Cyanide

Acidic and Reactive Sulfides

Oxidizers and Organics

Nitrates and Acids

Ammoniated Compounds and Hypochlorites and Bleach

Organic Nitrates/Perchlorates and other Oxidizers or Metals

Azides and Metals, Metal Salts, Acids, Srtong Oxidizers, Halogens

Perchloric Acid and Metals, Metal Salts, Charcoal, Ethers, Organics, Combustibles, Acids