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

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

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