

INCOMPATIBLE CHEMICALS



SOLID WASTE SECTION



A wide variety of chemicals react dangerously when mixed with certain other materials. Some of the more widely-used incompatible chemicals are given below, but the absence of a chemical from this list should not be taken to indicate that it is safe to mix it with any other chemical! When in doubt, refer to the Material Safety Data Sheet (MSDS).

- **bromine:** ammonia, acetylene, butadiene, hydrocarbons, hydrogen, sodium, finely-divided metals, turpentine, other hydrocarbons
- **calcium carbide:** water, alcohol
- **calcium oxide:** water
- **carbon, activated:** calcium hypochlorite, oxidizing agents
- **chlorates:** ammonium salts, acids, metal powders, sulphur, finely divided organic or combustible materials
- **chromic acid:** acetic acid, naphthalene, camphor, glycerin, turpentine, alcohols, flammable liquids in general
- **chlorine:** see bromine
- **chlorine dioxide:** ammonia, methane, phosphine, hydrogen sulphide
- **copper:** acetylene, hydrogen peroxide
- **cumene hydroperoxide:** acids, organic or inorganic
- **cyanides:** acids
- **flammable liquids:** ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
- **hydrocarbons:** fluorine, chlorine, bromine, chromic acid, sodium peroxide
- **hydrocyanic acid:** nitric acid, alkali
- **hydrofluoric acid:** aqueous or anhydrous ammonia
- **hydrogen peroxide:** copper, chromium, iron, most metals or their salts, alcohols, acetone, organic materials, aniline, nitromethane, flammable liquids, oxidizing gases
- **hydrogen sulphide:** fuming nitric acid, oxidizing gases
- **hypochlorites:** acids, activated carbon
- **iodine:** acetylene, ammonia (aqueous or anhydrous), hydrogen
- **mercury:** acetylene, fulminic acid, ammonia
 - **mercuric oxide:** sulphur
 - **nitrates:** sulphuric acid
- **acetic acid:** chromic acid, ethylene glycol, nitric acid, hydroxyl compounds, perchloric acid, peroxides, permanganates
- **acetone:** concentrated sulphuric and nitric acid mixtures
- **acetylene:** chlorine, bromine, copper, fluorine, silver, mercury
- **alkali and alkaline earth metals:** water, chlorinated hydrocarbons, carbon dioxide, halogens, alcohols, aldehydes, ketones, acids
- **aluminium (powdered):** chlorinated hydrocarbons, halogens, carbon dioxide, organic acids.
- **anhydrous ammonia:** mercury, chlorine, calcium hypochlorite, iodine, bromine, hydrofluoric acid
- **ammonium nitrate:** acids, metal powders, flammable liquids, chlorates, nitrites, sulphur, finely divided organic combustible materials
- **aniline:** nitric acid, hydrogen peroxide
- **arsenic compounds:** reducing agents
- **azides:** acids

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- **nitric acid (conc.):** acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulphide, flammable liquids, flammable gases
- **oxalic acid:** silver, mercury
- **perchloric acid:** acetic anhydride, bismuth and its alloys, ethanol, paper, wood
- **peroxides (organic):** acids, avoid friction or shock
- **phosphorus (white):** air, alkalies, reducing agents, oxygen
- **potassium:** carbon tetrachloride, carbon <http://chemresponsetool.noaa.gov/dioxide>, water
- **potassium chlorate:** acids
- **potassium perchlorate:** acids
- **potassium permanganate:** glycerin, ethylene glycol, benzaldehyde, sulphuric acid
- **selenides:** reducing agents
- **silver:** acetylene, oxalic acid, tartaric acid, ammonium compounds, fulminic acid
- **sodium:** carbon tetrachloride, carbon dioxide, water
- **sodium nitrate:** ammonium salts
- **sodium peroxide:** ethanol, methanol, glacial acetic acid, acetic anhydride, benzaldehyde, carbon disulphide, glycerin, ethylene glycol, ethyl acetate, methyl acetate, furfural
- **sulphides:** acids
- **sulphuric acid:** potassium chlorate, potassium perchlorate, potassium permanganate (or compounds with similar light metals, such as sodium, lithium, etc.)
- **tellurides:** reducing agents
- **zinc powder:** sulphur



Guidance

When certain hazardous chemicals are stored or mixed together, violent reactions may occur because the chemicals are unsuitable for mixing, or are *incompatible*. Classes of incompatible chemicals should be segregated from each other during storage, according to hazard class. Use the following general guidelines for hazard class storage:

- Flammable/Combustible Liquids and Organic Acids
- Flammable Solids
- Mineral Acids
- Caustics
- Oxidizers
- Perchloric Acid
- Compressed Gases

For more information:

- EPA-Managing chemical Reactivity Hazards. www.epa.gov/oem/docs/chem/reactive-management-pub.pdf
- Chemical safety references: www.thesafetylibrary.com/lib/chemicalsafety/storingchemicals.php
- Chemical response tool: www.cameochemicals.noaa.gov/help/cameo_chemicals_help.htm

The information contained in this fact sheet has been compiled from sources believed to be reliable and to represent the best opinions on the subject. This publication is intended to provide basic guidelines for the safe storage of chemicals and should serve as a starting point for good practices. Local, state, and federal laws and legal counsel should be consulted prior to initiating a chemical storage program. It cannot be assumed that all necessary warning and precautionary measures are contained in this publication; additional information may be required.