

Chemical Compatibility Reference Chart

Steel

Carbon Steel Chemical Compatibility Chart: Check the chemical compatibility of carbon steel with various chemicals, solvents, alcohols and other products.

Chemical	Compatibility
Acetaldehyde	D-Severe Effect
Acetamide	N/A
Acetate Solvent	D-Severe Effect
Acetic Acid	D-Severe Effect
Acetic Acid 20%	D-Severe Effect
Acetic Acid 80%	D-Severe Effect
Acetic Acid, Glacial	D-Severe Effect
Acetic Anhydride	D-Severe Effect
Acetone	B-Good
Acetyl Bromide	N/A
Acetyl Chloride (dry)	A-Excellent
Acetylene	A-Excellent
Acrylonitrile	A-Excellent
Adipic Acid	B-Good
Alcohols: Amyl	B-Good
Alcohols: Benzyl	B-Good
Alcohols: Butyl	B-Good
Alcohols: Diacetone	A-Excellent
Alcohols: Ethyl	B-Good
Alcohols: Hexyl	A-Excellent
Alcohols: Isobutyl	B-Good
Alcohols: Isopropyl	A-Excellent
Alcohols: Methyl	A-Excellent
Alcohols: Octyl	N/A
Alcohols: Propyl	A-Excellent
Aluminum Chloride	A-Excellent
Aluminum Chloride 20%	N/A
Aluminum Fluoride	D-Severe Effect
Aluminum Hydroxide	N/A
Aluminum Nitrate	D-Severe Effect
Aluminum Potassium Sulfate 10%	C-Fair

Aluminum Potassium Sulfate 100%	D-Severe Effect
Aluminum Sulfate	D-Severe Effect
Alums	N/A
Amines	B-Good
Ammonia 10%	N/A
Ammonia Nitrate	N/A
Ammonia, anhydrous	B-Good
Ammonia, liquid	A-Excellent
Ammonium Acetate	N/A
Ammonium Bifluoride	D-Severe Effect
Ammonium Carbonate	B-Good
Ammonium Caseinate	N/A
Ammonium Chloride	D-Severe Effect
Ammonium Hydroxide	D-Severe Effect
Ammonium Nitrate	D-Severe Effect
Ammonium Oxalate	N/A
Ammonium Persulfate	D-Severe Effect
Ammonium Phosphate, Dibasic	D-Severe Effect
Ammonium Phosphate, Monobasic	N/A
Ammonium Phosphate, Tribasic	N/A
Ammonium Sulfate	D-Severe Effect
Ammonium Sulfite	D-Severe Effect
Ammonium Thiosulfate	N/A
Amyl Acetate	C-Fair
Amyl Alcohol	B-Good
Amyl Chloride	A-Excellent
Aniline	A-Excellent
Aniline Hydrochloride	D-Severe Effect
Antifreeze	N/A
Antimony Trichloride	D-Severe Effect
Aqua Regia (80% HCl, 20% HNO ₃)	D-Severe Effect
Arochlor 1248	N/A
Aromatic Hydrocarbons	N/A
Arsenic Acid	D-Severe Effect
Arsenic Salts	N/A
Asphalt	B-Good
Barium Carbonate	N/A
Barium Chloride	C-Fair

Barium Cyanide	B-Good
Barium Hydroxide	A-Excellent
Barium Nitrate	C-Fair
Barium Sulfate	A-Excellent
Barium Sulfide	D-Severe Effect
Beer	C-Fair
Beet Sugar Liquids	B-Good
Benzaldehyde	B-Good
Benzene	A-Excellent
Benzene Sulfonic Acid	D-Severe Effect
Benzoic Acid	D-Severe Effect
Benzol	B-Good
Benzonitrile	N/A
Benzyl Chloride	D-Severe Effect
Bleaching Liquors	N/A
Borax (Sodium Borate)	A-Excellent
Boric Acid	D-Severe Effect
Brewery Slop	N/A
Bromine	D-Severe Effect
Butadiene	A-Excellent
Butane	A-Excellent
Butanol (Butyl Alcohol)	B-Good
Butter	N/A
Buttermilk	D-Severe Effect
Butyl Amine	A-Excellent
Butyl Ether	A-Excellent
Butyl Phthalate	D-Severe Effect
Butylacetate	A-Excellent
Butylene	A-Excellent
Butyric Acid	D-Severe Effect
Calcium Bisulfate	N/A
Calcium Bisulfide	N/A
Calcium Bisulfite	D-Severe Effect
Calcium Carbonate	B-Good
Calcium Chlorate	N/A
Calcium Chloride	N/A
Calcium Hydroxide	B-Good
Calcium Hypochlorite	D-Severe Effect

Calcium Nitrate	B-Good
Calcium Oxide	N/A
Calcium Sulfate	B-Good
Calgon	N/A
Cane Juice	N/A
Carbolic Acid (Phenol)	N/A
Carbon Bisulfide	N/A
Carbon Dioxide (dry)	A-Excellent
Carbon Dioxide (wet)	C-Fair
Carbon Disulfide	B-Good
Carbon Monoxide	A-Excellent
Carbon Tetrachloride	N/A
Carbon Tetrachloride (dry)	A-Excellent
Carbon Tetrachloride (wet)	B-Good
Carbonated Water	N/A
Carbonic Acid	D-Severe Effect
Catsup	N/A
Chloric Acid	D-Severe Effect
Chlorinated Glue	N/A
Chlorine (dry)	B-Good
Chlorine Water	D-Severe Effect
Chlorine, Anhydrous Liquid	D-Severe Effect
Chloroacetic Acid	D-Severe Effect
Chlorobenzene (Mono)	B-Good
Chlorobromomethane	N/A
Chloroform	B-Good
Chlorosulfonic Acid	D-Severe Effect
Chocolate Syrup	N/A
Chromic Acid 10%	D-Severe Effect
Chromic Acid 30%	D-Severe Effect
Chromic Acid 5%	D-Severe Effect
Chromic Acid 50%	D-Severe Effect
Chromium Salts	N/A
Cider	N/A
Citric Acid	D-Severe Effect
Citric Oils	N/A
Cloroxr (Bleach)	D-Severe Effect
Coffee	N/A

Copper Chloride	N/A
Copper Cyanide	N/A
Copper Fluoborate	N/A
Copper Nitrate	D-Severe Effect
Copper Sulfate >5%	D-Severe Effect
Copper Sulfate 5%	D-Severe Effect
Cream	N/A
Cresols	A-Excellent
Cresylic Acid	B-Good
Cupric Acid	N/A
Cyanic Acid	N/A
Cyclohexane	A-Excellent
Cyclohexanone	A-Excellent
Detergents	A-Excellent
Diacetone Alcohol	A-Excellent
Dichlorobenzene	B-Good
Dichloroethane	D-Severe Effect
Diesel Fuel	A-Excellent
Diethyl Ether	B-Good
Diethylamine	D-Severe Effect
Diethylene Glycol	A-Excellent
Dimethyl Aniline	N/A
Dimethyl Formamide	D-Severe Effect
Diphenyl	B-Good
Diphenyl Oxide	B-Good
Dyes	N/A
Epsom Salts (Magnesium Sulfate)	B-Good
Ethane	N/A
Ethanol	B-Good
Ethanolamine	B-Good
Ether	B-Good
Ethyl Acetate	B-Good
Ethyl Benzoate	N/A
Ethyl Chloride	D-Severe Effect
Ethyl Ether	B-Good
Ethyl Sulfate	N/A
Ethylene Bromide	B-Good
Ethylene Chloride	D-Severe Effect

Ethylene Chlorohydrin	B-Good
Ethylene Diamine	D-Severe Effect
Ethylene Dichloride	A-Excellent
Ethylene Glycol	B-Good
Ethylene Oxide	C-Fair
Fatty Acids	C-Fair
Ferric Chloride	D-Severe Effect
Ferric Nitrate	D-Severe Effect
Ferric Sulfate	D-Severe Effect
Ferrous Chloride	D-Severe Effect
Ferrous Sulfate	D-Severe Effect
Fluoboric Acid	N/A
Fluorine	D-Severe Effect
Fluosilicic Acid	D-Severe Effect
Formaldehyde 100%	D-Severe Effect
Formaldehyde 40%	D-Severe Effect
Formic Acid	D-Severe Effect
Freon 113	N/A
Freon 12	D-Severe Effect
Freon 22	D-Severe Effect
Freon TF	N/A
Freonr 11	D-Severe Effect
Fruit Juice	N/A
Fuel Oils	A-Excellent
Furan Resin	A-Excellent
Furfural	B-Good
Gallic Acid	D-Severe Effect
Gasoline (high-aromatic)	N/A
Gasoline, leaded, ref.	B-Good
Gasoline, unleaded	B-Good
Gelatin	D-Severe Effect
Glucose	B-Good
Glue, P.V.A.	A-Excellent
Glycerin	A-Excellent
Glycolic Acid	D-Severe Effect
Gold Monocyanide	N/A
Grape Juice	N/A
Grease	N/A

Heptane	A-Excellent
Hexane	A-Excellent
Honey	N/A
Hydraulic Oil (Petro)	A-Excellent
Hydraulic Oil (Synthetic)	A-Excellent
Hydrazine	D-Severe Effect
Hydrobromic Acid 100%	D-Severe Effect
Hydrobromic Acid 20%	D-Severe Effect
Hydrochloric Acid 100%	D-Severe Effect
Hydrochloric Acid 20%	D-Severe Effect
Hydrochloric Acid 37%	D-Severe Effect
Hydrochloric Acid, Dry Gas	N/A
Hydrocyanic Acid	B-Good
Hydrocyanic Acid (Gas 10%)	N/A
Hydrofluoric Acid 100%	D-Severe Effect
Hydrofluoric Acid 20%	D-Severe Effect
Hydrofluoric Acid 50%	D-Severe Effect
Hydrofluoric Acid 75%	D-Severe Effect
Hydrofluosilicic Acid 100%	D-Severe Effect
Hydrofluosilicic Acid 20%	D-Severe Effect
Hydrogen Gas	A-Excellent
Hydrogen Peroxide 10%	D-Severe Effect
Hydrogen Peroxide 100%	D-Severe Effect
Hydrogen Peroxide 30%	D-Severe Effect
Hydrogen Peroxide 50%	D-Severe Effect
Hydrogen Sulfide (aqua)	D-Severe Effect
Hydrogen Sulfide (dry)	D-Severe Effect
Hydroquinone	N/A
Hydroxyacetic Acid 70%	N/A
Ink	N/A
Iodine	D-Severe Effect
Iodine (in alcohol)	N/A
Iodoform	N/A
Isooctane	A-Excellent
Isopropyl Acetate	A-Excellent
Isopropyl Ether	A-Excellent
Isotane	N/A
Jet Fuel (JP3, JP4, JP5)	A-Excellent

Kerosene	A-Excellent
Ketones	B-Good
Lacquer Thinners	A-Excellent
Lacquers	A-Excellent
Lactic Acid	D-Severe Effect
Lard	A-Excellent
Latex	A-Excellent
Lead Acetate	D-Severe Effect
Lead Nitrate	D-Severe Effect
Lead Sulfamate	C-Fair
Ligroin	N/A
Lime	N/A
Linoleic Acid	D-Severe Effect
Lithium Chloride	D-Severe Effect
Lithium Hydroxide	B-Good
Lubricants	A-Excellent
Lye: Ca(OH) ₂ Calcium Hydroxide	D-Severe Effect
Lye: KOH Potassium Hydroxide	D-Severe Effect
Lye: NaOH Sodium Hydroxide	D-Severe Effect
Magnesium Bisulfate	N/A
Magnesium Carbonate	N/A
Magnesium Chloride	C-Fair
Magnesium Hydroxide	A-Excellent
Magnesium Nitrate	C-Fair
Magnesium Oxide	N/A
Magnesium Sulfate (Epsom Salts)	B-Good
Maleic Acid	D-Severe Effect
Maleic Anhydride	N/A
Malic Acid	D-Severe Effect
Manganese Sulfate	B-Good
Mash	N/A
Mayonnaise	N/A
Melamine	N/A
Mercuric Chloride (dilute)	D-Severe Effect
Mercuric Cyanide	D-Severe Effect
Mercurous Nitrate	B-Good
Mercury	C-Fair
Methane	D-Severe Effect

Methanol (Methyl Alcohol)	A-Excellent
Methyl Acetate	B-Good
Methyl Acetone	A-Excellent
Methyl Acrylate	N/A
Methyl Alcohol 10%	N/A
Methyl Bromide	A-Excellent
Methyl Butyl Ketone	N/A
Methyl Cellosolve	A-Excellent
Methyl Chloride	D-Severe Effect
Methyl Dichloride	N/A
Methyl Ethyl Ketone	A-Excellent
Methyl Ethyl Ketone Peroxide	N/A
Methyl Isobutyl Ketone	A-Excellent
Methyl Isopropyl Ketone	N/A
Methyl Methacrylate	N/A
Methylamine	A-Excellent
Methylene Chloride	B-Good
Milk	D-Severe Effect
Mineral Spirits	A-Excellent
Molasses	B-Good
Monochloroacetic acid	D-Severe Effect
Monoethanolamine	B-Good
Morpholine	A-Excellent
Motor oil	A-Excellent
Mustard	D-Severe Effect
Naphtha	B-Good
Naphthalene	A-Excellent
Natural Gas	A-Excellent
Nickel Chloride	D-Severe Effect
Nickel Nitrate	C-Fair
Nickel Sulfate	D-Severe Effect
Nitrating Acid (<15% HNO3)	N/A
Nitrating Acid (>15% H2SO4)	N/A
Nitrating Acid (S1% Acid)	N/A
Nitrating Acid (S15% H2SO4)	N/A
Nitric Acid (20%)	D-Severe Effect
Nitric Acid (50%)	D-Severe Effect
Nitric Acid (5-10%)	D-Severe Effect

Nitric Acid (Concentrated)	D-Severe Effect
Nitrobenzene	B-Good
Nitrogen Fertilizer	A-Excellent
Nitromethane	B-Good
Nitrous Acid	D-Severe Effect
Nitrous Oxide	B-Good
Oils: Aniline	A-Excellent
Oils: Anise	N/A
Oils: Bay	N/A
Oils: Bone	N/A
Oils: Castor	N/A
Oils: Cinnamon	N/A
Oils: Citric	D-Severe Effect
Oils: Clove	N/A
Oils: Coconut	N/A
Oils: Cod Liver	N/A
Oils: Corn	N/A
Oils: Cottonseed	B-Good
Oils: Creosote	B-Good
Oils: Diesel Fuel (20, 30, 40, 50)	A-Excellent
Oils: Fuel (1, 2, 3, 5A, 5B, 6)	A-Excellent
Oils: Ginger	N/A
Oils: Hydraulic Oil (Petro)	A-Excellent
Oils: Hydraulic Oil (Synthetic)	A-Excellent
Oils: Lemon	N/A
Oils: Linseed	A-Excellent
Oils: Mineral	B-Good
Oils: Olive	N/A
Oils: Orange	N/A
Oils: Palm	N/A
Oils: Peanut	N/A
Oils: Peppermint	N/A
Oils: Pine	N/A
Oils: Rapeseed	N/A
Oils: Rosin	C-Fair
Oils: Sesame Seed	N/A
Oils: Silicone	A-Excellent
Oils: Soybean	B-Good

Oils: Sperm (whale)	N/A
Oils: Tanning	N/A
Oils: Transformer	N/A
Oils: Turbine	N/A
Oleic Acid	D-Severe Effect
Oleum 100%	N/A
Oleum 25%	N/A
Oxalic Acid (cold)	D-Severe Effect
Ozone	C-Fair
Palmitic Acid	D-Severe Effect
Paraffin	A-Excellent
Pentane	C-Fair
Perchloric Acid	D-Severe Effect
Perchloroethylene	A-Excellent
Petrolatum	D-Severe Effect
Petroleum	C-Fair
Phenol (10%)	N/A
Phenol (Carbolic Acid)	N/A
Phosphoric Acid (>40%)	D-Severe Effect
Phosphoric Acid (crude)	D-Severe Effect
Phosphoric Acid (molten)	D-Severe Effect
Phosphoric Acid (S40%)	D-Severe Effect
Phosphoric Acid Anhydride	D-Severe Effect
Phosphorus	A-Excellent
Phosphorus Trichloride	A-Excellent
Photographic Developer	D-Severe Effect
Photographic Solutions	D-Severe Effect
Phthalic Acid	A-Excellent
Phthalic Anhydride	A-Excellent
Picric Acid	C-Fair
Potash (Potassium Carbonate)	B-Good
Potassium Bicarbonate	B-Good
Potassium Bromide	N/A
Potassium Chlorate	N/A
Potassium Chloride	D-Severe Effect
Potassium Chromate	B-Good
Potassium Cyanide Solutions	B-Good
Potassium Dichromate	B-Good

Potassium Ferricyanide	D-Severe Effect
Potassium Ferrocyanide	D-Severe Effect
Potassium Hydroxide (Caustic Potash)	C-Fair
Potassium Hypochlorite	D-Severe Effect
Potassium Iodide	N/A
Potassium Nitrate	B-Good
Potassium Oxalate	N/A
Potassium Permanganate	B-Good
Potassium Sulfate	B-Good
Potassium Sulfide	C-Fair
Propane (liquefied)	B-Good
Propylene	A-Excellent
Propylene Glycol	B-Good
Pyridine	A-Excellent
Pyrogallic Acid	B-Good
Resorcinal	N/A
Rosins	C-Fair
Rum	N/A
Rust Inhibitors	N/A
Salad Dressings	N/A
Salicylic Acid	D-Severe Effect
Salt Brine (NaCl saturated)	D-Severe Effect
Sea Water	D-Severe Effect
Shellac (Bleached)	A-Excellent
Shellac (Orange)	A-Excellent
Silicone	A-Excellent
Silver Bromide	D-Severe Effect
Silver Nitrate	D-Severe Effect
Soap Solutions	A-Excellent
Soda Ash (see Sodium Carbonate)	B-Good
Sodium Acetate	D-Severe Effect
Sodium Aluminate	A-Excellent
Sodium Benzoate	N/A
Sodium Bicarbonate	C-Fair
Sodium Bisulfate	C-Fair
Sodium Bisulfite	D-Severe Effect
Sodium Borate (Borax)	A-Excellent
Sodium Bromide	D-Severe Effect

Sodium Carbonate	B-Good
Sodium Chlorate	N/A
Sodium Chloride	D-Severe Effect
Sodium Chromate	B-Good
Sodium Cyanide	B-Good
Sodium Ferrocyanide	N/A
Sodium Fluoride	D-Severe Effect
Sodium Hydrosulfite	N/A
Sodium Hydroxide (20%)	D-Severe Effect
Sodium Hydroxide (50%)	D-Severe Effect
Sodium Hydroxide (80%)	D-Severe Effect
Sodium Hypochlorite (<20%)	D-Severe Effect
Sodium Hypochlorite (100%)	D-Severe Effect
Sodium Hyposulfate	N/A
Sodium Metaphosphate	D-Severe Effect
Sodium Metasilicate	B-Good
Sodium Nitrate	B-Good
Sodium Perborate	C-Fair
Sodium Peroxide	C-Fair
Sodium Polyphosphate	C-Fair
Sodium Silicate	A-Excellent
Sodium Sulfate	B-Good
Sodium Sulfide	B-Good
Sodium Sulfite	C-Fair
Sodium Tetraborate	A-Excellent
Sodium Thiosulfate (hypo)	D-Severe Effect
Sorghum	N/A
Soy Sauce	N/A
Stannic Chloride	D-Severe Effect
Stannic Fluoborate	N/A
Stannous Chloride	D-Severe Effect
Starch	A-Excellent
Stearic Acid	D-Severe Effect
Stoddard Solvent	A-Excellent
Styrene	C-Fair
Sugar (Liquids)	A-Excellent
Sulfate (Liquors)	D-Severe Effect
Sulfur Chloride	D-Severe Effect

Sulfur Dioxide	D-Severe Effect
Sulfur Dioxide (dry)	A-Excellent
Sulfur Hexafluoride	N/A
Sulfur Trioxide	C-Fair
Sulfur Trioxide (dry)	A-Excellent
Sulfuric Acid (<10%)	D-Severe Effect
Sulfuric Acid (10-75%)	D-Severe Effect
Sulfuric Acid (75-100%)	D-Severe Effect
Sulfuric Acid (cold concentrated)	D-Severe Effect
Sulfuric Acid (hot concentrated)	D-Severe Effect
Sulfurous Acid	D-Severe Effect
Sulfuryl Chloride	N/A
Tallow	C-Fair
Tannic Acid	D-Severe Effect
Tanning Liquors	N/A
Tartaric Acid	D-Severe Effect
Tetrachloroethane	B-Good
Tetrachloroethylene	A-Excellent
Tetrahydrofuran	A-Excellent
Tin Salts	N/A
Toluene (Toluol)	A-Excellent
Tomato Juice	D-Severe Effect
Trichloroacetic Acid	D-Severe Effect
Trichloroethane	B-Good
Trichloroethylene	B-Good
Trichloropropane	A-Excellent
Tricresylphosphate	A-Excellent
Triethylamine	N/A
Trisodium Phosphate	A-Excellent
Turpentine	B-Good
Urea	B-Good
Uric Acid	N/A
Urine	B-Good
Varnish	C-Fair
Vegetable Juice	B-Good
Vinegar	C-Fair
Vinyl Acetate	C-Fair
Vinyl Chloride	A-Excellent

Water, Acid, Mine	D-Severe Effect
Water, Deionized	A-Excellent
Water, Distilled	D-Severe Effect
Water, Fresh	D-Severe Effect
Water, Salt	D-Severe Effect
Weed Killers	N/A
Whey	N/A
Whiskey & Wines	D-Severe Effect
White Liquor (Pulp Mill)	C-Fair
White Water (Paper Mill)	N/A
Xylene	A-Excellent
Zinc Chloride	D-Severe Effect
Zinc Hydrosulfite	N/A
Zinc Sulfate	D-Severe Effect

Explanation of Footnotes

1. Satisfactory to 72°F (22°C)
2. Satisfactory to 120°F (48°C)

Ratings: Chemical Effect

A = Excellent.

B = Good, Minor Effect, slight corrosion or discoloration

C = Fair, Moderate Effect, not recommended for continuous use. Softening, loss of strength, or swelling may occur.

D = Severe Effect, not recommended for ANY use.

N/A = Information not available.

Please note that these charts are for general reference only. We have aggregated this data from dozens of original sources and any single piece of data cannot be guaranteed.

Additionally, many factors affect the chemical resistance of a given plastic product including the concentration/purity of the chemical, working temperature, wall thickness and condition of the container, etc. It is **your responsibility** to test a container and chemical together ensure compatibility under your unique circumstances.

Visit www.cplabsafety.com/chemical-compatibility-charts for up to date information.