ROC Carbon Company

Carbon/Graphite Grade Selection Guide

Applications, physical properties, and chemical compatibility tables

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ROC Carbon carbon/graphite materials combine the superior strength, hardness, and wear resistance of carbon with the natural lubricity of graphite. These chemically bonded carbon materials are strong and thermally stable and are inert in most chemical and corrosive applications. When even higher mechanical properties or impervious materials are required, material performance properties can be enhanced by special impregnation with resins or metals. These impregnated carbon grades offer maximum resistance to corrosion, wear, and oxidation.

Many of the grades described below are proprietary formulations developed and manufactured only by ROC Carbon Company. Also, the grades presented in this guide are only a representative sampling of our many grades. Please call for information on other grades.

In general, ROC Carbon carbon/graphite seals and bearings are used where extreme operating temperatures and/or corrosive fluids would cause conventional lubricants to decompose, where lubricants would contaminate process fluids, and where equipment design makes conventional lubricating systems too expensive to install and maintain. Nonlubricating applications for which ROC Carbon supplies carbon/graphite grades include electrodes and brazing boats, jigs, and fixtures.

How to use this Guide

To select a grade or grades for further evaluation, start with Table 1, which presents our general grade recommendations both by application and by operating conditions. Next, use Table 2 to review the physical properties of the grades you chose from Table 1. To check for chemical compatibility by Corrosion Resistance (CR) Group, use Table 3 for compatibility by chemical family or Table 4- for compatibility with specific chemicals.

For additional information on the listed grades or on other available grades, contact us at the address on the back cover.

TABLE 1 - General Grade Recommendations

The following suggestions are based on years of application experience. However, they should be used only as a starting point. For final recommendations, consult ROC Applications Engineering.

APPLICATIONS

Bearings, bushings
R-122, R-191, R-203, R-204, R-208, R-211, R-307, R-383, R-391

Brazing boats, jigs, fixtures
R-320, R-383

Seals
R-122, R-124, R-203, R-208, R-211, R-307

Turbine rings
R-320, R-383

Piston rings, rod packing
R-122, R-204, R-208, R-211, R-383

Electrodes
R-320, R-383

OPERATING CONDITIONS

High temperature
R-422, R-443

Cryogenic service
R-122, R-124, R-208, R-211, R-422, R-443

Acids
R-122, R-124, R-208, R-211, R-307, R-422

Table 2 - Physical Properties of Selected Grades

Material Group	CR Group	Grade	Composition Code[1]	Apparent Density gm/cc	Hardness Shore Schleroscope	Transverse Strength PSI	Transverse Strength MPa	Compressive Strength PSI	Compressive Strength MPa	Modulus of Elasticity 10^6 PSI	Coefficient of Thermal Expansion x10^6/in/in/°F	Temperature Limit Oxidizing Atmos. °F	Temperature Limit Oxidizing Atmos. °C	Temperature Limit Inert Atmos. °F	Temperature Limit Inert Atmos. °C
A	2	R-122	CGI	1.82	84	9,300	64	30,000	207	3.3	2.9	500	260	500	260
	3	R-124	CGI	1.90	90	12,000	83	24,000	165	2.9	2.7	500	260	500	260
	2	R-208	CGI	1.80	101	10,100	70	31,900	220	3.7	2.7	400	205	400	205
	2	R-211	CGI	1.87	87	11,300	78	36,500	245	3.2	3.1	480	250	480	250
	2	R-307	CGI	1.85	77	11,000	76	27,000	186	2.3	2.6	500	260	500	260
B	4	R-422	GX	1.85	55	5,500	38	14,000	97	1.2	2.1	1,200	650	1,600	870
	4	R-443	CGX	1.80	90	8,000	55	30,000	207	2.4	2.5	1,000	540	1,500	815
C	1	R-320	G	1.64	45	2,700	19	5,500	38	1.6	1.5	750	400	5,000	2,760
	1	R-383	G	1.70	45	4,200	29	10,000	69	1.2	1.7	800	425	5,000	2,760
E	5	R-190	CG (Cu)	2.85	40	7,500	52	16,000	110	2.8	2.0	700	370	1,700	925
	5	R-191	CG (NiCr)	2.85	45	6,500	45	15,000	103	3.1	1.7	700	370	1,700	925
	5	R-203	CG (Sb)	2.20	120[2]	11,600	80	36,000	248	4.2	2.2	750	400	1,100	595
	5	R-204	CG (B)	2.45	55	4,800	34	23,500	164	2.9	1.9	400	205	400	205
	5	R-391	CG (Br)	2.55	55	8,500	59	25,000	172	3.1	2.1	500	260	500	260
F	1	R-433	CG	1.65	70	5,800	40	24,100	167	1.5	2.8	700	370	1,800	980

[1]Composition Codes
- B Babbit
- Br Bronze
- C Carbon
- Cu Copper
- G Graphite
- I Impregnation
- NiCr Nickel chrome
- X Oxidation impregnation
- Sb Antimony

[2]HRB

Note: The physical properties of ROC Carbon grades may vary in relation to the molded part size and configuration; the above values are typical and should be considered only as a guide or reference.

Chemical Compatibility

The tables on this page present general grade recommendations for chemical service. However, a particular grade's resistance to chemical attack can vary substantially according to temperature, concentration, and exposure time. Please consult with ROC Carbon's applications engineering staff to determine the appropriate grade for your specific application.

TABLE 3 - Corrosion Resistance by Chemical Family

		CR Group				
		CR 1	CR 2	CR 3	CR 4	CR 5
Inorganic	Neutral salts	✔	✔	✔	✘	✔
	Acid-forming salts	✔	✔	✔	✘	❍
	Alkali-forming salts	✔	✔	✔	✘	❍
	Nonoxidizing mineral acids	✔	✔	✔	✘	❍
	Oxidizing mineral acids	❍	❍	✔	❍	❍
	Nonoxidizing mineral alkalis	✔	✔	✔	✘	❍
	Oxidizing mineral alkalis	❍	✔	✔	✘	❍
Organic	Neutral (solvents, oils, etc.)	✔	✔	✔	❍	✔
	Acid-forming salts	✔	✔	✔	✘	❍
	Weak acids	✔	✔	✔	❍	✔
	Strong acids	✔	❍	✔	✘	❍
	Weak alkalis	✔	✔	✔	✘	❍
	Strong Alkalis	✔	✔	✔	✘	❍
Melts	Neutral salts	✔	❍	✔	❍	❍
	Acid salts	✔	❍	✔	❍	❍
	Alkaline salts	✔	❍	✔	✘	❍
	Oxidizing salts	❍	❍	❍	❍	❍
	Metals	✔	❍	✔	❍	❍
Gases	Inert	✔	✔	✔	✔	✔
	Acid	✔	✔	✔	❍	❍
	Alkaline	✔	✔	✔	✘	❍
	Oxidizing	❍	❍	❍	✔	❍
	Reducing	✔	✔	✔	✔	✔

✔ *Compatible* ❍ *Questionable* ✘ *Not Recommended*

Table 4 - Corrosion Resistance by Specific Chemical

	CR Groups 1 2 3 4 5						CR Groups 1 2 3 4 5						CR Groups 1 2 3 4 5						CR Groups 1 2 3 4 5
Abietic Acid	✔ ✔ ✔ ❍ ✔	Carbolic Acid (Phenol)	✔ ✔ ✔ ✘ ✔	Hydrocyanic (Prussic) Acid	✔ ✔ ✔ ✘ ❍	Potassium Alum	✔ ✔ ✔ ✘ ❍
Acetaldehyde	✔ ✔ ✔ ❍ ✔	Carbon Dioxide to 600° F	✔ ✔ ✔ ✔ ❍	Hydrofluoric Acid to 48%	✔ ✔ ✔ ✘ ❍	Potassium Bicarbonate	✔ ✔ ✔ ✘ ✔
Acetanilide	✔ ✔ ✔ ✘ ✔	Carbon Dioxide above 600° F	❍ ❍ ❍ ✔ ❍	Hydrogen	✔ ✔ ✔ ✔ ✔	Potassium Carbonate	✔ ✔ ✔ ✘ ✔
Acetic Acid to 350° F	✔ ✔ ✔ ✘ ❍	Carbon Disulfide	✔ ✔ ✔ ❍ ✔	Hydrogen Chloride	✔ ✔ ✔ ❍ ✔	Potassium Chlorate	❍ ✔ ✔ ✘ ❍
Acetic Anhydride to 350° F	✔ ✔ ✔ ✘ ❍	Carbon Monoxide	✔ ✔ ✔ ✔ ✔	Hydrogen Fluoride	✔ ✔ ✔ ❍ ✔	Potassium Choride	✔ ✔ ✔ ✘ ✔
Acetone	✔ ✔ ✔ ❍ ✔	Carbon Tetrachloride	✔ ✔ ✔ ✔ ✔	Hydrogen Sulfide	✔ ✔ ✔ ❍ ✔	Potassium Cyanide	✔ ✔ ✔ ✘ ✘
Acetophenone	✔ ✔ ✔ ❍ ✔	Castor Oil	✔ ✔ ✔ ❍ ✔	Hydrogen Peroxide	❍ ❍ ✔ ✘ ❍	Potassium Hydroxide to 350° F	✔ ✔ ✔ ✘ ❍
Acetylene	✔ ✔ ✔ ✔ ✔	Caustic Soda	✔ ✔ ✔ ✘ ❍	Hydroxylamine	✔ ✔ ✔ ✘ ✔	Potassium Nitrate to 300° F	✔ ✔ ✔ ✘ ✔
Acetylsalicylic Acid (Aspirin)	✔ ✔ ✔ ❍ ✔	"Cellosolves"	✔ ✔ ✔ ❍ ✔	Hypochlorous Acid	❍ ❍ ✔ ❍ ✘	Potassium Permanganate to 300° F	✔ ✔ ✔ ✘ ❍
Acrolein	✔ ✔ ✔ ❍ ✔	Cellulose Acetate (rayon)	✔ ✔ ✔ ❍ ✔	Isobutyl/Isopropyl Alcohols	✔ ✔ ✔ ❍ ✔	Potassium Phosphate	✔ ✔ ✔ ✘ ✔
Acrylonitrile	✘ ❍ ✔ ✔ ❍	Chloracetic Acid	✔ ✔ ✔ ❍ ✔	Isophthalic Acid	✔ ✔ ✔ ✘ ✔	Propane	✔ ✔ ✔ ✔ ✔
Adipic Acid	✔ ✔ ✔ ❍ ✔	Chloral	✔ ✔ ✔ ✔ ✔	Kerosene	✔ ✔ ✔ ✔ ✔	Propionic Acid	✔ ✔ ✔ ✘ ❍
Air to 600° F	✔ ❍ ✔ ✔ ❍	"Chlorethene"	✔ ✔ ✔ ✔ ✔	Lactic/Lauric Acids	✔ ✔ ✔ ❍ ✔	Propylene	✔ ✔ ✔ ✔ ✔
Air above 600° F	❍ ✘ ❍ ✔ ✘	Chlorine	✔ ✔ ✔ ❍ ✔	Lead (Molten)	✔ ❍ ✔ ❍ ✘	Pyridine	✔ ✘ ✔ ✘ ✔
Alkyl Aryl Sulfonate	✔ ✔ ✔ ❍ ✔	Chlorobenzene	✔ ✔ ✔ ✔ ✔	Lithium Carbonate	✔ ✔ ✔ ✘ ✔	Pyroligneous Liquor	✔ ✔ ✔ ✘ ❍
Allyl Chloride	✔ ✔ ✔ ✘ ✔	Chloroform	✔ ✔ ✔ ✔ ✔	Lithium Hydroxide	✔ ✔ ✔ ✘ ❍	Sal Ammonia	✔ ✔ ✔ ✘ ❍
Alum (ammonia)	✔ ✔ ✔ ✘ ❍	Chlorosulfonic Acid	✔ ✔ ✔ ✘ ✔	Lubricating Oil	✔ ✔ ✔ ✔ ✔	Sal Soda—Na_2CO_3 • 10 H_20	✔ ✔ ✔ ✘ ✔
Alum (chrome)	✔ ✔ ✔ ✘ ❍	Chromic Acid to 300° F	❍ ❍ ✔ ✘ ✔	Lye	✔ ✔ ✔ ✘ ❍	Salicylic Acid	✔ ✔ ✔ ✘ ✔
Alum (potash)	✔ ✔ ✔ ✘ ❍	Chromium Potassium Sulfate	✔ ✔ ✔ ✘ ✔	Magnesium (Molten)	✔ ❍ ✔ ✘ ✘	Sea Water	✔ ✔ ✔ ✘ ✔
Aluminum (molten)	✔ ❍ ✔ ❍ ✘	Citric Acid (citrus juices)	✔ ✔ ✔ ✘ ✔	Magnesium Bisulfite	✔ ✔ ✔ ✘ ✔	Sewage	✔ ✔ ✔ ✘ ✔
Aluminum Chloride	✔ ✔ ✔ ✘ ❍	Coal Tar	✔ ✔ ✔ ✔ ✔	Magnesium Sulfate	✔ ✔ ✔ ✘ ❍	Silver	✔ ❍ ✔ ❍ ✘
Aluminum Sulfate	✔ ✔ ✔ ✘ ✔	Copper	✔ ❍ ✔ ❍ ✘	Maleic Acid	✔ ✔ ✔ ✘ ❍	Soap and Soap Liquors	✔ ✔ ✔ ✘ ✔
Ammonia (wet) to 300° F	✔ ✔ ✔ ✘ ✔	Copper Sulfate	✔ ✔ ✔ ✘ ✔	Maleic Anhydride	✔ ✔ ✔ ✘ ❍	Soda Ash	✔ ✔ ✔ ✘ ✘
Ammonia (anhydrous)	✔ ✔ ✔ ✔ ✔	Cottonseed Oil	✔ ✔ ✔ ❍ ✔	Mercuric Chloride	✔ ✔ ✔ ✘ ✘	Sodium Salts-see Potassium Salts	
Ammonium Chloride	✔ ✔ ✔ ✘ ❍	Creosote	✔ ✔ ✔ ❍ ✔	Mercury	✔ ✔ ✔ ✘ ✘	Sodium Bisulfite	✔ ✔ ✔ ✘ ✔
Ammonium Hydroxide	✔ ✔ ✔ ✘ ✔	Cresols, Cresylic Acid	✔ ✔ ✔ ❍ ✔	Methane	✔ ✔ ✔ ✔ ✔	Sodium Dichromate	✔ ✔ ✔ ✘ ✔
Ammonium Nitrate	✔ ✔ ✔ ✘ ✔	Crotonaldehyde	✔ ✔ ✔ ❍ ✔	Methyl Alcohol (Methanol)	✔ ✔ ✔ ❍ ✔	Sodium Hypochlorite	❍ ❍ ✔ ✘ ❍
Ammonium Phosphate .	✔ ✔ ✔ ✘ ✔	Cumene	✔ ✔ ✔ ✔ ✔	Methyl Chloride	✔ ✔ ✔ ✔ ✔	Sodium Metaphosphate	✔ ✔ ✔ ✘ ✔
Amyl Acetate	✔ ✔ ✔ ❍ ✔	Cupric Chloride	✔ ✔ ✔ ✘ ✔	Methylene Dichloride	✔ ✔ ✔ ✔ ✔	Sodium Nitrate (Nitrate Melt)	❍ ✘ ❍ ❍ ❍
Amyl Alcohol	✔ ✔ ✔ ❍ ✔	Cuprous Ammonium Acetate-Viscose	✔ ✔ ✔ ✘ ✔	Methyl Ethyl Ether	✔ ✔ ✔ ❍ ✔	Sodium Perborate	❍ ✔ ✔ ✘ ❍
Amyl Amines	✔ ✔ ✔ ✘ ✔	Cyanic Acid	✔ ✔ ✔ ❍ ❍	Methyl Ethyl Ketone	✔ ✔ ✔ ❍ ✔	Sodium Perchlorate	❍ ✔ ✔ ✘ ❍
Amyl Chloride	✔ ✔ ✔ ✘ ✔	Cyanide Plating Solutions	✔ ✔ ✔ ✘ ❍	Methyl Isobutyl Ketone	✔ ✔ ✔ ❍ ✔	Sodium Sulfate	✔ ✔ ✔ ✘ ❍
Aniline	✔ ✔ ✔ ✘ ✔	Cyclohexane	✔ ✔ ✔ ✔ ✔	Methyl Salicylate	✔ ✔ ✔ ❍ ✔	Sodium Sulfide	✔ ✔ ✔ ✘ ❍
Anthracene	✔ ✔ ✔ ✔ ✔	Detergents	✔ ✔ ✔ ✘ ✔	Milk	✔ ✔ ✔ ✘ ✔	Sodium Tetraborate (Borax)	✔ ✔ ✔ ✘ ❍
Antimony	✔ ❍ ✔ ❍ ✘	Dibutyl Phosphate	✔ ✔ ✔ ❍ ✔	Mineral Oil	✔ ✔ ✔ ✔ ✔	Sodium Thiosulfate (Hypo)	✔ ✔ ✔ ✘ ✔
Argon	✔ ✔ ✔ ✔ ✔	Diethanol Amine	✔ ✔ ✔ ✘ ✔	Molasses	✔ ✔ ✔ ✘ ✔	Sorbitol	✔ ✔ ✔ ❍ ✔
Arsenic (Molten)	✔ ❍ ✔ ❍ ✘	Diethyl Sulfate (Ethyl Sulfate)	✔ ✔ ✔ ✘ ✔	Monoethanol Amine	✔ ✔ ✔ ✘ ✔	Stannic Chloride	✔ ✔ ✔ ✘ ❍
Asphalt	✔ ✔ ✔ ✔ ✔	Disodium Phosphate	✔ ✔ ✔ ✘ ✔	Muriatic Acid	✔ ✔ ✔ ✘ ❍	Steam to 600° F	✔ ✔ ✔ ❍ ❍
Aromatic Fuels	✔ ✔ ✔ ✔ ✔	"Dowtherm"	✔ ✔ ✔ ✘ ✔	Naphtha	✔ ✔ ✔ ✔ ✔	Steam 600 to 1500° F	❍ ✘ ❍ ✔ ❍
Babbitt Metal (molten)	✔ ❍ ✔ ❍ ✘	Epichlorohydrin	✔ ✔ ✔ ✘ ✔	Naphthalene	✔ ✔ ✔ ✔ ✔	Stearic Acid	✔ ✔ ✔ ❍ ✔
Baking Soda	✔ ✔ ✔ ✘ ✔	Ethane	✔ ✔ ✔ ✔ ✔	Nickel Chloride	✔ ✔ ✔ ✘ ❍	Styrene	✔ ✔ ✔ ✔ ✔
Barium Hydroxide	✔ ✔ ✔ ✘ ❍	Ether (Ethyl Ether)	✔ ✔ ✔ ❍ ✔	Nickel Sulfate	✔ ✔ ✔ ✘ ✔	Sugar	✔ ✔ ✔ ✘ ✔
Barium Sulfide	✔ ✔ ✔ ✘ ✔	Ethyl Acetate	✔ ✔ ✔ ❍ ✔	Nitrating Acid to 75% total acid	❍ ❍ ✔ ✘ ❍	Sulfate Liquors	✔ ✔ ✔ ✘ ✔
Battery Acid (90% H_2S0_4)	✔ ❍ ✔ ✘ ❍	Ethyl Alcohol	✔ ✔ ✔ ❍ ✔	Nitric Acid to 15%	✔ ✔ ✔ ✘ ❍	Sulfite Liquors	✔ ✔ ✔ ✘ ✔
Beer	✔ ✔ ✔ ✘ ✔	Ethyl Benzene	✔ ✔ ✔ ✔ ✔	Nitric Acid 15 to 100%	✔ ❍ ✔ ✘ ✘	Sulfur	✔ ❍ ✔ ❍ ❍
Benzaldehyde	✔ ✔ ✔ ❍ ✔	Ethyl Chloride and Dichloride	✔ ✔ ✔ ✘ ✔	Nitrobenzene	✔ ✔ ✔ ✔ ✔	Sulfur Dioxide to 500° F	✔ ✔ ✔ ❍ ❍
Benzene (benzol)	✔ ✔ ✔ ✔ ✔	Ethylene	✔ ✔ ✔ ✔ ✔	Nitrogen	✔ ✔ ✔ ✔ ✔	Sulfuric Acid to 77%, 300° F	✔ ✔ ✔ ✘ ✔
Benzene Sulfonic Acid	✔ ✔ ✔ ❍ ✔	Ethylene Glycol	✔ ✔ ✔ ❍ ✔	Nitrogen Tetroxide	❍ ✘ ❍ ✔ ✘	Sulfuric Acid 77-98% to 200° F	✔ ❍ ✔ ✘ ❍
Benzoic Acid	✔ ✔ ✔ ❍ ✔	Ethylene Oxide	✔ ✔ ✔ ❍ ✔	Nitro Paraffins	✔ ✔ ✔ ✔ ✔	Tar	✔ ✔ ✔ ✔ ✔
Beta-Naphthol	✔ ✔ ✔ ❍ ✔	Fatty Acids	✔ ✔ ✔ ❍ ❍	Oleic Acid	✔ ✔ ✔ ❍ ✔	Terephthalic Acid	✔ ✔ ✔ ✘ ✔
Bismuth (Molten)	✔ ✔ ✔ ✘ ✔	Ferric Chloride	✔ ✔ ✔ ✘ ❍	Oleum (Fuming H_2S0_4) to 100° F	❍ ❍ ✔ ✘ ❍	Tetrachloroethylene	✔ ✔ ✔ ✔ ✔
Black Ash	✔ ✔ ✔ ✘ ✔	Ferric Sulfate	✔ ✔ ✔ ✘ ✔	Olive Oil	✔ ✔ ✔ ❍ ✔	Tin	✔ ❍ ✔ ❍ ✘
Black Sulfate Liquor .	✔ ✔ ✔ ✘ ✔	Fluorine gas	❍ ❍ ❍ ✔ ❍	Ortho Phosphoric Acid to 400° F	✔ ✔ ✔ ✘ ❍	Toluene	✔ ✔ ✔ ✔ ✔
Bleaching Powder	✔ ❍ ✔ ❍ ✘	Fluorosilicic Acid	✔ ❍ ✔ ✘ ❍	Oxalic Acid	✔ ✔ ✔ ✘ ❍	Toluene Sulfonic Acid	✔ ✔ ✔ ✘ ❍
Borax	✔ ✔ ✔ ✘ ✔	Formaldehyde	✔ ✔ ✔ ❍ ✔	Oxygen to 500° F	✔ ✔ ✔ ✔ ✔	Toluic Acid	✔ ✔ ✔ ✘ ❍
Boric Acid	✔ ✔ ✔ ✘ ✔	Formamide	✔ ✔ ✔ ✘ ✔	Oxygen above 500° F	❍ ❍ ❍ ✔ ✘	Trichloroethylene	✔ ✔ ✔ ✔ ✔
Boron Trifluoride	✔ ✔ ✔ ✘ ✘	Formic Acid	✔ ✔ ✔ ✘ ❍	Palmitic Acid	✔ ✔ ✔ ❍ ✔	Triethanol Amine	✔ ✔ ✔ ✘ ✔
Brass (Molten)	✔ ❍ ✔ ❍ ✘	Freons	✔ ✔ ✔ ✔ ✔	Paraffin	✔ ✔ ✔ ✔ ✔	Trisodium Phosphate	✔ ✔ ✔ ✘ ✔
Bromine	✔ ❍ ✔ ❍ ❍	Fruit juices	✔ ✔ ✔ ✘ ✔	Pentaerythritol	✔ ✔ ✔ ❍ ✔	Turpentine	✔ ✔ ✔ ✔ ✔
Bronze (Molten)	✔ ❍ ✔ ❍ ✘	Fuel Oil	✔ ✔ ✔ ✔ ✔	Perchloric Acid to 72%, 200° F	❍ ❍ ✔ ✘ ✘	Urea	✔ ✔ ✔ ✘ ✔
Butadiene	✔ ✔ ✔ ✔ ✔	Furfural	✔ ✔ ✔ ❍ ✔	Perchloroethylene	✔ ✔ ✔ ✔ ✔	Vegetable Oil	✔ ✔ ✔ ❍ ✔
Butane	✔ ✔ ✔ ✔ ✔	Gallium	✔ ❍ ✔ ❍ ❍	Petroleum	✔ ✔ ✔ ✔ ✔	Vinegar	✔ ✔ ✔ ✘ ❍
Butter, Buttermilk	✔ ✔ ✔ ❍ ✔	Gasoline	✔ ✔ ✔ ✔ ✔	Phenol	✔ ❍ ✔ ✘ ✔	Vinyl Acetate	✔ ✔ ✔ ❍ ✔
Butyl Acetate	✔ ✔ ✔ ❍ ✔	Glutamic Acid	✔ ✔ ✔ ❍ ✔	Phosphoric Acid to 400° F	✔ ✔ ✔ ✘ ❍	Vinyl Chloride	✔ ✔ ✔ ✔ ✔
Butyl Alcohol	✔ ✔ ✔ ❍ ✔	Glycerine	✔ ✔ ✔ ❍ ✔	Phosphorus	✔ ❍ ✔ ❍ ❍	Viscose	✔ ✔ ✔ ✘ ✔
Butyl Amines	✔ ✔ ✔ ✘ ✔	Gold (Molten)	✔ ✔ ✔ ✘ ✔	Phosphorus Oxychloride	✔ ✔ ✔ ✘ ❍	Water to 300° F	✔ ✔ ✔ ✘ ✔
Butylene	✔ ✔ ✔ ✔ ✔	Green Sulfate Liquor	✔ ✔ ✔ ✘ ✔	Phosphorus Trichloride	✔ ✔ ✔ ❍ ❍	Water Glass (Na_2SiO_3)	✔ ✔ ✔ ✘ ✔
Cadmium (Molten)	✔ ❍ ✔ ❍ ✘	Helium	✔ ✔ ✔ ✔ ✔	Phthalic Acid/Anhydride	✔ ✔ ✔ ✘ ❍	Wood Pulp	❍ ✔ ✔ ✘ ❍
Calcium Bisulfite	✔ ✔ ✔ ✘ ✔	Hexane	✔ ✔ ✔ ✔ ✔	Picric Acid	✔ ✔ ✔ ✘ ✔	Xylene	✔ ✔ ✔ ✔ ✔
Calcium Chloride	✔ ✔ ✔ ✘ ✔	Hydrazine	✔ ✔ ✔ ✘ ✔	Polyethylene	✔ ✔ ✔ ✔ ✔	Zinc	✔ ❍ ✔ ❍ ❍
Calcium Hydroxide	✔ ✔ ✔ ✘ ❍	Hydrobromic Acid	✔ ✔ ✔ ✘ ❍	Polystyrene	✔ ✔ ✔ ✔ ✔	Zinc Chloride	✔ ✔ ✔ ✘ ✔
Calcium Hypochlorite	❍ ❍ ✔ ✘ ✘	Hydrochloric (muriatic) Acid	✔ ✔ ✔ ✘ ❍	Polyurethane	✔ ✔ ✔ ✔ ✔	Zinc Sulfate	✔ ✔ ✔ ✘ ✔

✔ *= Compatible* ❍ *= Questionable* ✘ *= Not recommended*