

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	Hastelloy C 316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Acetamide	CH <sub>3</sub> CONH <sub>2</sub>	-	-	A	-	-	-	150	73	100	-	A	200	200
Acetate Solv. (Pure)*	-	-	-	A	-	D	350	-	D	-	-	-	D	D
Acetic Acid. (Glacial)	CH <sub>3</sub> COOH	100	1.00	A	A	110	350	D	180	180	A	A	D	73
Acetic Acid 20%*	CH <sub>3</sub> COOH	20	-	A	A	140	350	D	140	200	-	-	180	200
Acetic Acid 80%*	CH <sub>3</sub> COOH	80	-	A	A	D	350	D	73	140	-	-	180	100
Acetic Acid*	CH <sub>3</sub> COOH	50	-	A	A	100	350	D	100	200	-	-	180	200
Acetic Anhydride	(CH <sub>3</sub> CO) <sub>2</sub> O	-	5.00	-	-	D	-	D	90	73	A	A	D	200
Acetone*	CH <sub>3</sub> COCH <sub>3</sub>	-	-	A	A	D	-	-	-	-	-	-	-	-
Acetyl Chloride	C <sub>6</sub> H <sub>5</sub> COCH <sub>3</sub>	-	3.00	A	-	-	-	D	100	-	-	-	-	D
Acetylene	(CH <sub>3</sub> CO) <sub>2</sub> O	-	-	A	B	100	-	-	200	-	A	A	-	-
Acrylonitrile	H <sub>2</sub> C=CHCN	-	-	-	B	D	350	140	100	73	A	A	250	200
Alcohol, Amyl*	C <sub>5</sub> H <sub>11</sub> OH	-	-	-	A	100	400	140	250	170	-	-	190	200
Alcohol, Benzyl*	C <sub>6</sub> H <sub>5</sub> CH <sub>2</sub> OH	-	-	-	A	D	-	-	180	140	-	-	140	D
Alcohol, Butyl*	-	-	-	-	A	140	250	140	240	180	-	-	100	180
Alcohol, Diacetone*	-	-	-	-	A	D	350	-	73	73	-	-	D	70
Alcohol, Ethyl*	C <sub>2</sub> H <sub>5</sub> OH	-	-	-	A	140	300	140	750	180	A	A	170	170
Alcohol, Hexyl*	-	-	-	-	A	100	-	-	-	70	A	A	160	D
Alcohol, Isobutyl*	(CH <sub>2</sub> ) <sub>2</sub> CHCH <sub>2</sub> OH	-	-	-	A	-	300	-	250	-	A	A	140	140
Alcohol, Isopropyl*	(CH <sub>2</sub> ) <sub>2</sub> CHOH	-	-	-	-	140	300	140	230	150	A	A	200	140
Alcohol, Methyl*	CH <sub>3</sub> OH	-	-	-	A	140	300	140	230	150	A	A	100	100
Alcohol, Octyl*	-	-	-	-	-	-	-	-	-	-	A	A	-	-
Alcohol, Propyl*	CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> OH	-	-	A	A	A	A	-	B	A	A	A	A	A
Aluminum Chloride 20%	ALCL <sub>3</sub>	20	-	C	A	A	-	B	-	A	A	A	A	A
Aluminum Chloride	ALCL <sub>3</sub>	-	-	-	-	140	210	140	140	170	A	A	180	210
Aluminum Flouride	ALF <sub>3</sub>	-	-	-	-	140	-	160	280	200	-	-	-	-
Aluminum Hydroxide	AL(OH) <sub>3</sub>	-	-	A	-	140	250	-	250	180	-	-	180	150
Alum Potassium Sulfate (ALUM) 10%	-	10	-	-	B	A	A	A	-	-	A	A	A	-
Alum Potassium Sulfate (ALUM) 100%	-	-	-	-	-	140	400	140	280	180	-	-	-	200
Aluminum Sulfate	AL <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub>	10	-	-	A	140	250	-	280	180	A	A	-	210
Amines	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia 10%	NH <sub>3</sub>	10	-	A	A	A	A	-	D	A	-	A	A	-
Ammonia Anhydrous	-	-	-	-	-	D	400	160	250	180	C	A	-	-
Ammonia, Liquids*	NH <sub>3</sub>	-	-	A	B	A	A	D	-	A	A	A	D	A
Ammonia, Nitrate	NH <sub>4</sub> NO <sub>3</sub>	-	-	A	-	B	-	-	-	A	A	A	-	-
Ammonium Bifluoride	NH <sub>4</sub> HF <sub>2</sub>	-	-	-	-	140	300	-	250	180	-	-	140	-
Ammonium Carbonate	NH <sub>4</sub> HCO <sub>3</sub>	-	-	-	-	140	250	140	250	200	-	-	200	200
Ammonium Casenite	-	-	-	-	-	-	140	-	-	-	-	-	-	-
Ammonium Chloride	NH <sub>4</sub> CL	-	-	-	-	140	250	140	250	180	A	A	220	-
Ammonium Hydroxide*	NH <sub>4</sub> OH	-	-	-	A	140	400	150	250	180	A	A	0	200
Ammonium Nitrate	NH <sub>4</sub> NO <sub>3</sub>	-	-	-	-	140	250	140	160	180	A	A	180	-
Ammonium Oxalate	(NH <sub>4</sub> ) <sub>2</sub> C <sub>2</sub> O <sub>4</sub>	-	-	-	-	-	140	-	-	A	-	-	-	-
Ammonium Persulfate	S <sub>2</sub> O <sub>8</sub>	-	-	A	-	140	-	140	200	180	-	-	76	-

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	Hastelloy C 316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Ammonium Phosphate, Dibasic	(NH <sub>4</sub> ) <sub>2</sub> HPO <sub>4</sub>	-	-	-	-	140	300	140	250	180	A	A	180	210
Ammonium Phosphate, Monobasic	NH <sub>4</sub> H <sub>2</sub> PO <sub>4</sub>	-	-	-	A	140	-	140	250	180	A	A	190	210
Ammonium Phosphate, Tribasic	-	-	-	-	A	140	-	140	250	180	A	A	190	210
Ammonium Sulfate	(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	-	1.80	-	-	140	350	140	250	180	A	A	180	210
Ammonium Thio-Sulfate	(NH <sub>4</sub> ) <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	-	0.86	-	-	140	-	140	250	-	A	A	200	180
Amyl-Acetate*	CH <sub>3</sub> COOC <sub>5</sub> H <sub>11</sub>	-	0.86	A	A	D	400	D	180	D	A	A	D	70
Amyl Alcohol	C <sub>5</sub> H <sub>11</sub> OH	-	-	-	-	-	-	-	-	-	-	-	-	-
Amyl Chloride	-	-	1.02	B	-	D	-	D	240	D	A	A	68	D
Aniline	C <sub>6</sub> H <sub>5</sub> NH <sub>2</sub>	-	1.02	-	-	D	400	D	200	100	A	A	140	70
Anti-Freeze	CH <sub>2</sub> OHCH <sub>2</sub> OH	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony Trichloride	SbCl <sub>3</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-
Aqua Regia (80%, HCl, 20%, HNO)	CLHHNO <sub>3</sub>	-	-	-	C	D	380	D	200	D	-	D	140	D
Arochlor 1248	-	-	-	-	-	-	300	D	-	D	A	-	-	-
Aromatic Hydrocarbons	-	-	-	-	-	D	-	-	40	68	A	-	180	D
Arsenic Acid	H <sub>3</sub> AsO <sub>4</sub>	80	-	A	A	100	-	140	210	140	A	A	210	150
Asphalt	-	-	-	-	-	D	-	-	250	140	-	A	180	D
Barium Carbonate	BaCO <sub>3</sub>	-	4.30	-	-	140	400	140	250	180	-	-	300	250
Barium Chloride	BaCl <sub>2</sub>	-	3.10	-	-	140	400	140	250	180	-	-	300	250
Barium Cyanide	Ba(CN) <sub>2</sub>	-	-	-	-	-	-	140	-	-	-	-	-	-
Barium Hydroxide	Ba(OH) <sub>2</sub>	-	2.20	-	-	140	400	140	250	180	A	A	200	200
Barium Nitrate	Ba(NO <sub>3</sub> ) <sub>2</sub>	-	-	-	-	80	400	140	250	140	A	A	300	200
Barium Sulfate	BaSO <sub>4</sub>	-	4.30	A	A	140	400	140	250	180	A	B	200	200
Barium Sulfide	BaSO <sub>4</sub>	-	-	A	-	140	400	150	280	200	A	A	250	140
Beer	-	-	-	A	A	140	400	-	250	180	A	A	200	200
Beet Sugar Liquids	-	-	-	-	-	-	-	-	-	-	A	A	-	-
Benzaldehyde	C <sub>6</sub> H <sub>5</sub> CHO	-	5.00	A	A	D	400	D	120	73	A	A	-	-
Benzene	C <sub>6</sub> H <sub>6</sub>	-	0.90	B	B	D	350	D	150	100	A	A	140	D
Benzoic Acid	C <sub>6</sub> H <sub>5</sub> COOH	-	1.30	B	A	180	400	150	250	250	-	-	180	-
Benzol (see Benzene)	C <sub>6</sub> H <sub>6</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-
Bleach (see Sodium Hypochlorite)	NaOCl	-	-	-	-	-	-	-	-	-	-	-	-	-
Borax (Sodium Borate)	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub>	-	1.40	A	-	140	400	140	250	180	A	A	180	-
Boric Acid	H <sub>3</sub> BO <sub>3</sub>	-	-	-	A	140	400	140	250	180	A	A	200	210
Brewery Slop	-	-	-	-	-	-	-	-	-	-	A	A	-	-
Bromine (Wet)	-	-	3.10	-	-	-	-	D	-	-	D	-	D	-
Butadiene (Gas)	H <sub>2</sub> C:CHHC:CH <sub>2</sub>	-	0.80	A	B	140	-	D	250	D	-	-	190	D
Butanes*	C <sub>4</sub> H <sub>10</sub>	-	-	A	B	100	400	D	200	70	-	-	180	D
Butanol (see Alcohol, Butyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butter	-	-	-	A	-	-	-	-	-	-	-	-	-	-
Buttermilk	-	-	-	A	-	-	-	-	-	-	-	-	-	-
Butylene*	-	-	-	-	-	-	250	-	250	D	A	-	D	D
Butyl Acetate*	-	-	0.90	-	-	-	-	D	-	-	-	-	D	-
Butyric Acid	-	-	-	-	A	D	-	D	220	180	D	-	D	D
Calcium Bisulfate	-	-	-	A	-	A	A	-	-	-	-	-	A	-
Calcium Bisulfide	Ca(HS) <sub>2</sub>	-	-	-	A	120	400	140	210	200	A	A	D	100

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	Hastelloy C 316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Calcium Bisulfite	Ca(HSO <sub>3</sub> ) <sub>2</sub>	-	-	-	-	100	210	-	210	200	-	A	D	100
Calcium Carbonate	CaCO <sub>3</sub>	-	2.70	A	A	140	300	140	250	200	A	A	140	100
Calcium Chlorate	Ca(CLO <sub>3</sub> ) <sub>2</sub>	-	2.70	A	B	140	400	140	250	200	A	-	140	73
Calcium Chloride	CaCL <sub>2</sub>	-	2.10	B	A	140	350	140	250	200	A	A	200	150
Calcium Hydroxide	Ca(OH) <sub>2</sub>	-	2.30	-	-	140	400	140	250	210	A	A	70	140
Calcium Hypochlorite	Ca(OCL) <sub>2</sub>	-	2.30	-	B	140	380	140	200	180	A	A	100	D
Calcium Sulfate	CaSO <sub>4</sub>	-	2.90	A	B	140	400	140	210	180	A	A	200	210
Calgon	-	-	-	-	-	-	-	140	-	-	A	A	-	-
Cane Juice	-	-	-	A	A	140	350	140	250	140	A	A	200	250
Carbolic Acid (See Phenol)	C <sub>6</sub> H <sub>5</sub> OH	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Bisulfide	CS <sub>2</sub>	-	-	-	A	-	-	-	-	-	-	-	-	-
Carbon Dioxide (Wet)	CO <sub>2</sub>	-	-	A	A	140	350	140	250	180	-	-	210	170
Carbon Disulfide*	CS <sub>2</sub>	-	-	A	A	D	400	D	68	D	A	A	180	-
Carbon Monoxide	CO	-	-	A	-	140	400	140	250	180	A	A	180	-
Carbon Tetrachloride	CCl <sub>4</sub>	-	1.60	C	A	D	350	D	140	D	A	A	190	D
Carbonated Water	-	-	-	A	B	A	-	-	-	A	A	A	A	A
Carbonic Acid	H <sub>2</sub> CO <sub>3</sub>	-	-	A	A	140	350	140	250	210	A	A	200	210
Catsup	-	-	-	A	A	-	-	-	-	-	-	-	-	-
Caustic Soda (Sodium Hydroxide)	NaOH	-	2.13	-	-	140	250	D	100	200	-	-	D	200
Chloroacetic Acid	CH <sub>2</sub> CLCOOH	D	-	C	-	-	300	D	-	-	-	-	D	-
Chloric Acid	HCLO <sub>3</sub>	20	-	D	A	140	140	-	-	140	-	-	D	A
Chlorinated Glue	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorine, Anhydrous Liquid	-	-	-	D	A	D	A	D	-	D	A	D	A	B
Chlorine (Dry)	CL <sub>2</sub>	-	-	-	-	D	350	D	250	D	A	A	140	D
Chlorine Water	-	-	-	-	-	140	400	-	250	-	C	A	180	73
Chlorobenzene (Mono)*	C <sub>6</sub> H <sub>5</sub> CL	-	-	A	A	D	A	D	A	D	A	A	A	D
Chlorosulfonic Acid	CLSO <sub>2</sub> OH	6	1.77	-	-	D	180	D	D	D	-	-	D	D
Chlorox (Bleach)	NaOCL:H <sub>2</sub> O	5.5	-	B	-	140	350	140	140	140	-	-	140	100
Chocolate Syrup	-	-	-	A	B	-	-	-	-	100	-	-	100	-
Chromic Acid 5%	H <sub>2</sub> CrO <sub>4</sub>	5	2.80	A	-	140	400	140	250	140	D	C	180	73
Chromic Acid 10%	H <sub>2</sub> CrO <sub>4</sub>	10	-	-	A	140	400	140	250	140	D	-	180	73
Chromic Acid 30%	H <sub>2</sub> CrO <sub>4</sub>	30	-	-	A	100	400	100	200	D	D	-	300	-
Chromic Acid 50%	H <sub>2</sub> CrO <sub>4</sub>	50	-	B	B	D	350	100	180	-	D	-	300	-
Citric Acid	-	-	1.54	-	-	140	200	140	240	180	-	-	200	200
Citric Oils	-	-	-	-	-	-	-	-	-	-	A	A	-	-
Coffee	-	-	-	A	-	-	-	-	-	-	A	A	200	140
Copper ChlorideA	CuCL <sub>3</sub>	-	3.40	C	A	140	350	-	250	180	-	A	200	210
Copper CyanideA	Cu(CN) <sub>2</sub>	-	-	A	A	140	300	140	200	180	A	A	190	200
Copper Floborate	-	-	-	-	-	100	-	-	-	-	-	-	-	-
Copper Nitrate	Cu(NO <sub>3</sub> ) <sub>2</sub>	-	2.30	-	-	140	350	140	210	180	-	A	200	210
Copper SulfateA (5% Solution)	CuSO <sub>4</sub>	5	-	-	-	140	350	140	210	180	A	A	210	200
Copper Sulfate	CuSO <sub>4</sub>	-	2.30	-	-	140	350	140	210	180	-	A	210	200
Cream	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cresols	-	-	1.05	-	-	D	400	D	180	D	A	A	100	D

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	Hastelloy C 316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Cresylic Acid	-	-	-	-	-	D	-	-	D	D	A	A	200	D
Cyclohexane*	-	-	-	A	-	D	400	D	210	D	A	A	180	D
Cyanic Acid	HN=C=O	-	-	A	-	-	-	-	-	-	-	-	D	-
Detergents	-	-	-	A	-	140	400	D	250	180	A	A	210	200
Dichlorethane	CLCH <sub>2</sub> CH <sub>2</sub> CL	-	-	A	-	D	400	D	210	D	C	A	150	-
Diesel Fuel*	-	-	-	-	-	72	400	-	250	100	A	A	190	D
Diethylamine	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NH	-	-	A	-	D	400	-	100	100	-	-	D	120
Diethylene Glycol	-	-	-	A	-	140	350	-	280	180	A	A	200	-
Diphenyl Oxide	(C <sub>6</sub> H <sub>5</sub> ) <sub>2</sub> O	-	-	A	-	-	-	-	-	-	A	A	100	D
Dyes	-	-	-	A	-	-	-	-	-	-	-	-	A	-
Epsom Salts (Magnesium Sulfate)	MgSO <sub>4</sub>	-	-	-	-	140	300	140	280	180	140	-	200	180
Ethane	C <sub>2</sub> H <sub>6</sub>	-	-	-	-	73	350	-	280	-	-	-	-	D
Ethanolamine	-	-	1.02	-	-	D	100	-	D	D	-	-	-	100
Ether*	-	-	-	A	-	D	350	-	100	D	-	-	D	DEthyl
Acetate*	CH <sub>3</sub> COOL <sub>2</sub> H <sub>5</sub>	-	-	A	-	D	350	D	100	100	A	A	D	70
Ethyl Chloride*	C <sub>2</sub> H <sub>5</sub> CL	-	0.92	-	-	D	350	D	250	D	A	A	140	70
Ethyl Sulfate	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> SO <sub>4</sub>	-	-	-	-	-	-	-	-	-	-	-	D	-
Ethylene Chloride*	CLCH <sub>2</sub> CH <sub>2</sub> CL	-	-	A	B	D	A	-	C	D	A	A	-	C
Ethylene Dichloride	CLCH <sub>2</sub> CH <sub>2</sub> CL	-	1.25	-	-	D	-	D	200	D	C	A	150	D
Ethylene Glycol	CH <sub>2</sub> OHCH <sub>2</sub> OH	-	1.12	-	-	140	400	140	200	180	-	-	300	180
Ethylene Oxide*	(CH <sub>2</sub> ) <sub>2</sub> O	-	0.90	-	-	D	400	70	200	D	-	-	D	D
Fatty Acids	-	-	-	-	-	140	250	D	250	140	-	-	180	D
Ferric Chloride	FeCL <sub>3</sub>	-	2.90	D	C	140	400	140	250	180	A	A	210	200
Ferric Nitrate	FeNO <sub>3</sub>	50	1.70	A	-	140	400	140	250	180	-	-	180	180
Ferric Sulfate	Fe(SO <sub>4</sub> ) <sub>3</sub>	-	3.10	-	-	140	400	140	250	180	C	A	190	210
Ferrous Chloride	FeCL <sub>3</sub>	-	3.20	D	A	140	400	140	250	180	A	A	200	200
Ferrous Sulfate	FeSO <sub>4</sub>	-	1.90	A	A	140	400	140	280	180	A	A	200	180
Fluboric Acid	HBf <sub>4</sub>	-	1.80	-	-	140	400	140	200	140	-	-	200	160
Fluorine Gas (Wet)	F <sub>2</sub>	-	-	-	-	D	250	D	80	D	D	-	D	-
Fluorine (Liquid)	F <sub>2</sub>	-	-	-	A	D	D	D	-	D	D	-	100	D
Fluosilicic Acid	H <sub>2</sub> SiF <sub>6</sub>	25	1.11	-	-	140	250	D	140	150	-	-	D	140
Formaldehyde 40%	HCHO	40	-	A	A	B	A	-	B	A	-	A	D	-
Formaldehyde	HCHO	50	-	-	-	140	250	D	140	73	A	-	D	140
Formic Acid	HCOOH	25	-	-	-	100	300	D	210	100	-	-	100	200
Freon 11	CCL <sub>3</sub> F	-	1.22	A	-	72	250	-	250	73	-	-	180	D
Freon 12 (Wet)A	CL <sub>2</sub> CF <sub>2</sub>	-	-	-	-	-	250	-	-	-	-	-	-	-
Freon 22	HCCIF <sub>2</sub>	-	-	A	A	D	D	-	150	73	-	-	D	D
Freon 113	CCL <sub>3</sub> CCF <sub>3</sub>	-	-	A	-	-	250	-	250	-	-	-	70	D
Freon T. F.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fruit Juice	-	-	-	-	-	140	400	140	250	180	-	-	210	-
Fuel Oils*	-	-	-	A	A	-	400	D	250	D	-	-	80	D
Furan Resin	-	-	-	-	-	-	-	-	D	-	-	-	D	D
Furfural	-	-	0.94	-	-	D	400	D	80	D	-	-	D	-
Gallic Acid	-	-	-	-	-	140	400	D	100	73	-	-	190	73

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	Hastelloy C 316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Gasoline*	-	-	-	A	A	C	A	D	A	C	A	A	A	C
Gelatin	-	-	-	A	-	140	300	-	250	180	-	-	180	200
Glucose	C <sub>6</sub> H <sub>12</sub> O <sub>6</sub>	-	-	A	-	140	400	140	280	180	-	-	300	250
Glue P.V.A.	-	-	-	-	-	140	250	-	-	120	-	-	250	100
Glycerine (see Glycerol)	C <sub>3</sub> H <sub>5</sub> (OH) <sub>3</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-
Glycolic Acid (see Hydroxyacetic acid)	-	-	-	A	B	-	-	-	-	-	-	-	-	-
Gold Monocyanide	Au(CN) <sub>4</sub>	-	-	A	-	-	-	-	-	-	A	A	A	-
Grape Juice	-	-	-	-	-	140	250	-	-	-	-	-	210	140
Grease	-	-	-	-	-	-	-	70	-	-	-	-	200	D
Heptane*	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>5</sub> CH <sub>3</sub>	-	-	-	-	100	300	-	250	73	-	-	340	D
Hexane*	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>4</sub> CH <sub>3</sub>	-	0.66	-	-	D	300	D	250	73	-	-	340	D
Honey	-	-	-	-	-	140	400	140	300	180	-	-	250	D
Hydraulic Oils (Petroleum) <sub>1</sub>	-	-	-	-	-	-	300	-	-	D	-	-	250	D
Hydraulic Oils (Synthetic) <sub>1</sub>	-	-	-	-	-	-	300	-	-	D	-	-	250	D
Hydrazine	H <sub>2</sub> NNH <sub>2</sub>	-	1.00	-	-	D	250	-	200	D	-	-	D	70
Hydrobromic Acid 20%	HBr	20	-	D	-	140	250	140	250	180	-	B	190	140
Hydrobromic Acid	HBr	48	1.50	-	-	140	250	140	250	180	-	-	190	140
Hydrobromic Acid	HBr	48	-	-	-	140	400	140	250	180	-	-	190	140
Hydrochloric Acid (Dry Gas)	HCL	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrochloric Acid 20%	HCL	20	-	-	-	140	400	140	250	160	-	-	190	200
Hydrochloric Acid 37%	HCL	37	1.19	D	-	140	400	140	210	160	A	C	200	100
Hydrochloric Acid 100%	HCL	100	-	D	C	A	A	A	-	-	A	C	C	-
Hydrocyanic Acid (Prussic Acid)	HCN	-	-	A	-	140	400	140	250	140	A	A	190	200
Hydrocyanic Acid (Gas 10%)	HCN	10	-	-	-	140	400	140	250	140	-	-	190	200
Hydrofluoric Acid 20%	HF	20	-	-	A	100	300	70	250	150	B	C	150	100
Hydrofluoric Acid 75%	HF	75	0.99	-	-	D	250	-	200	100	D	D	100	D
Hydrofluoric Acid 100%	HF	100	-	D	B	C	A	-	-	-	D	D	-	-
Hydrofluosilicic Acid 20%	H <sub>2</sub> SiF <sub>6</sub>	20	-	-	-	73	300	140	250	180	-	-	200	140
Hydrofluosilicic Acid	H <sub>2</sub> SiF <sub>6</sub>	-	-	-	-	73	300	140	250	180	-	-	200	140
Hydrogen Gas	H	-	-	-	-	140	300	140	280	180	-	-	200	250
Hydrogen Peroxide 10%	H <sub>2</sub> O <sub>2</sub>	10	-	-	-	140	250	140	250	73	A	A	180	100
Hydrogen Peroxide 30%	H <sub>2</sub> O <sub>2</sub>	30	-	-	-	140	250	140	250	D	-	-	200	100
Hydrogen Peroxide	H <sub>2</sub> O <sub>2</sub>	-	-	-	-	D	400	-	68	D	-	-	100	D
Hydrogen Sulfide (Aqueous Solution)	H <sub>2</sub> S	-	1.19	A	B	140	400	140	200	150	A	A	140	100
Hydrogen Sulfide (Dry)	H <sub>2</sub> S	-	-	A	B	140	400	140	80	150	-	A	180	100
Hydroxyacetic Acid (Glycolic Acid)	CH <sub>2</sub> OHCOOH	-	1.27	-	-	140	400	-	100	150	-	-	D	-
Ink	-	-	-	-	-	-	-	D	-	-	-	-	70	70
Iodine	I <sub>2</sub>	0	-	-	-	D	400	D	150	D	-	-	180	70
Iodine (In Alcohol)	-	-	-	B	A	D	A	-	-	B	-	A	A	-
Iodoform	-	-	-	A	-	-	A	-	-	-	-	-	A	-
Isotane	-	-	-	-	-	-	-	-	-	D	-	A	A	-

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Isopropyl Acetate	(CH <sub>3</sub> ) <sub>2</sub> CHOH	-	0.92	-	-	D	200	-	-	-	-	-	D	70
Isopropyl Ether*	CH <sub>3</sub> CHCLCH <sub>3</sub>	-	0.72	-	-	D	140	-	130	D	-	-	D	D
Jet Fuel (JP3)*	-	-	-	-	-	-	200	-	-	-	-	-	190	D
Jet Fuel (JP4)*	-	-	-	-	-	140	400	-	250	D	-	-	300	D
Jet Fuel (JP5)*	-	-	-	-	-	140	400	-	250	D	-	-	300	D
Kerosene*	-	-	0.81	-	-	140	300	D	250	D	-	-	300	D
Ketones	-	-	-	-	-	D	350	D	100	100	-	-	D	D
Lacquers*	-	-	-	-	-	-	-	-	-	-	-	-	D	D
Lacquer Thinners*	-	-	-	-	-	D	-	-	-	-	-	-	-	-
Lactic Acid	-	-	1.20	-	-	100	400	D	140	180	-	-	210	70
Lard	-	-	-	-	-	140	250	-	250	73	-	-	190	D
Latex	-	-	-	-	-	-	-	-	-	-	-	-	70	70
Lead Acetate	Pb(C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> ) <sub>2</sub>	-	-	B	B	140	400	140	250	180	-	-	D	210
Lead Sulfamate	-	-	-	-	-	-	-	-	-	A	-	-	A	D
Ligroin (Benzene)	-	-	-	-	-	D	250	-	200	D	-	-	100	D
Lime	CaO	-	-	-	-	-	-	-	-	-	-	-	-	-
Lubricants	-	-	-	-	-	-	-	-	-	-	A	A	-	-
Magnesium Carbonate	MgCO <sub>3</sub>	-	3.00	-	-	140	400	140	210	180	-	-	210	170
Magnesium Chloride	MgCL <sub>2</sub>	-	2.30	-	-	140	400	140	280	180	-	-	180	180
Magnesium Hydroxide	Mg(OH) <sub>2</sub>	-	2.36	-	-	140	400	140	250	180	A	A	230	170
Magnesium Nitrate	Mg(NO <sub>3</sub> ) <sub>2</sub>	-	2.03	-	-	140	400	140	250	180	-	A	230	140
Magnesium Oxide	MgO	-	3.60	-	-	-	-	-	-	-	-	A	-	140
Magnesium Sulfate	MgSO <sub>4</sub>	-	2.60	-	-	140	400	140	250	180	A	A	200	180
Maleic Acid	-	-	1.59	-	-	140	400	70	250	180	A	A	200	70
Maleic Anhydride	-	-	0.93	-	-	-	-	-	-	-	A	A	-	D
Malic Acid	-	-	1.60	B	B	140	400	-	250	180	-	-	230	180
Mash	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mayonnaise	-	-	-	-	-	-	400	-	-	-	-	-	-	-
Melamine	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercuric Chloride (Dilute Solution)	HgCL <sub>2</sub>	-	5.40	-	-	140	400	140	250	180	-	-	190	210
Mercuric Cyanide	Hg(CN) <sub>2</sub>	-	4.00	-	-	140	400	140	250	180	-	-	70	70
Mercury	Hg	-	13.6	A	A	140	400	140	250	150	-	-	200	70
Methanol (See Alcohol Methyl)	CH <sub>3</sub> OH	-	0.80	A	-	140	400	D	250	180	-	-	D	100
Methyl Acetate	CH <sub>3</sub> CO <sub>2</sub> CH <sub>3</sub>	-	0.92	-	-	D	-	-	100	68	-	-	D	-
Methyl Acrylate	-	-	-	-	-	-	300	-	100	-	-	-	D	70
Methyl Alcohol*	CH <sub>3</sub> OH	-	-	-	-	140	400	D	250	180	A	A	100	100
Methyl Bromide	CH <sub>3</sub> Br	-	1.73	-	-	D	350	D	250	D	-	-	180	D
Methyl Butyl Ketone	CH <sub>3</sub> COC <sub>4</sub> H <sub>9</sub>	-	0.83	-	-	D	400	-	100	D	A	A	D	70
Methyl Cellosolve	HOCH <sub>2</sub> CH <sub>2</sub> OCH <sub>3</sub>	-	-	-	-	D	400	-	250	73	-	-	D	70
Methyl Chloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Dichloride	-	-	-	-	-	-	-	-	-	-	A	A	A	D
Methyl Ethyl Ketone*	CH <sub>3</sub> COC <sub>2</sub> H <sub>5</sub>	-	0.82	B	-	D	-	D	D	73	A	A	D	70
Methyl Isobutyl Ketone*	-	-	0.80	-	-	D	400	-	D	D	A	A	D	-
Methyl Isopropyl Ketone*	CH <sub>3</sub> COCH(CH <sub>3</sub> ) <sub>2</sub>	-	0.82	-	-	D	400	-	D	D	A	A	D	-

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	Hastelloy C 316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Methyl Methacrylate	-	-	0.94	-	-	D	300	-	100	D	A	A	D	D
Methylamine	CH <sub>3</sub> NH <sub>2</sub>	-	-	-	-	D	400	-	D	D	-	-	100	70
Methylene Chloride	CH <sub>2</sub> CL <sub>2</sub>	-	1.34	-	-	D	350	D	100	D	A	A	D	D
Milk	-	-	-	-	-	140	400	140	280	180	A	A	190	190
Molasses	-	-	-	-	-	140	400	140	250	180	A	A	300	100
Mustard	-	-	-	-	-	140	400	-	250	150	-	-	150	150
Naphtha*	-	-	-	-	-	140	400	D	210	100	-	-	150	D
Napthalene*	C <sub>10</sub> H <sub>8</sub>	-	1.15	-	-	D	400	D	200	D	-	-	170	D
Nickel Chloride	NiCL <sub>2</sub>	-	3.50	-	-	140	400	140	250	180	-	-	210	210
Nickel Sulfate	NiSO <sub>4</sub>	-	3.70	-	A	140	400	140	250	180	-	-	180	210
Nitric Acid (10% Solution)	HNO <sub>3</sub>	10	-	-	-	140	400	100	250	180	C	B	190	D
Nitric Acid (20% Solution)	HNO <sub>3</sub>	20	-	-	-	140	400	140	210	140	D	C	190	D
Nitric Acid (50% Solution)	HNO <sub>3</sub>	50	-	-	-	D	350	D	120	73	D	-	100	D
Nitric Acid (Concentrated Solution)	HNO <sub>3</sub>	-	1.50	-	-	D	300	D	73	D	D	-	D	D
Nitrobenzene	C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub>	-	1.20	-	-	D	400	D	140	73	A	-	70	D
Oils, Aniline	-	-	-	-	A	D	250	-	120	100	A	A	D	140
Oils, Anise	-	-	-	-	-	-	300	-	-	-	A	A	-	-
Oils, Bay	-	-	-	-	-	-	300	-	-	-	A	A	140	-
Oils, Bone	-	-	-	-	-	-	300	-	-	-	A	A	140	-
Oils, Castor	-	-	-	-	-	-	300	-	-	-	A	A	140	-
Oils, Cinnamon	-	-	-	-	-	-	300	-	-	-	A	A	D	-
Oils, Citric	-	-	-	-	-	-	300	-	-	72	A	A	140	-
Oils, Clove	-	-	-	-	-	-	300	-	-	72	A	A	-	-
Oils, Coconut	-	-	-	-	-	140	350	-	250	150	A	A	140	D
Oils, Cod Liver	-	-	-	-	-	-	300	-	-	72	A	A	140	108
Oils, Corn	-	-	-	-	-	68	250	250	-	100	A	A	140	D
Oils, Cotton Seed	-	-	-	-	-	140	300	250	-	250	A	A	140	D
Oils, Cresote	-	-	-	-	-	D	300	-	-	D	A	A	73	D
Oils, Diesel Fuel	-	-	-	-	-	72	300	250	-	73	A	A	140	D
Oils, Fuel	-	-	-	-	-	140	300	250	-	73	A	A	140	D
Oils, Ginger	-	-	-	A	-	-	-	-	-	-	A	A	A	-
Oils, Hydraulic (See Hydraulic)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Oils, Lemon	-	-	-	A	-	-	-	-	-	D	A	A	A	-
Oils, Linseed	-	-	-	-	-	140	300	250	-	180	A	A	220	D
Oils, Mineral	-	-	-	-	-	140	300	250	-	180	A	A	150	-
Oils, Olive	-	-	-	-	-	140	300	250	-	180	A	A	150	-
Oils, Orange	-	-	-	A	-	-	A	-	-	A	A	A	A	-
Oils, Palm	-	-	-	A	-	A	-	-	-	-	A	A	A	-
Oils, Peanut	-	-	-	A	-	A	-	-	-	D	A	A	A	-
Oils, Peppermint	-	-	-	A	-	-	-	-	-	D	A	A	A	-
Oils, Pine	-	-	-	-	-	140	300	-	-	-	A	A	70	-
Oils, Rape Seed	-	-	-	A	-	A	-	-	-	-	A	A	A	-
Oils, Rosin	-	-	-	A	-	-	-	-	-	-	A	A	A	-
Oils, Sesame Seed	-	-	-	A	-	A	-	-	-	-	A	A	A	-

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Oils, Silicone	-	-	-	A	-	-	350	-	250	150	A	A	190	140
Oils, Soybean	-	-	-	A	-	A	-	-	-	A	A	A	A	-
Oils, Sperm	-	-	-	A	-	A	-	-	-	A	A	A	A	-
Oils, Tanning	-	-	-	A	-	-	-	-	-	A	A	A	A	-
Oils, Turbine	-	-	-	A	-	A	-	-	-	A	A	A	A	-
Oleic Acid	-	-	0.90	A	-	140	250	-	250	73	-	-	190	70
Oleum 25%	H <sub>2</sub> SO <sub>4</sub>	25	-	-	A	D	A	-	B	-	-	A	A	D
Oleum	H <sub>2</sub> SO <sub>4</sub>	100	-	-	-	D	200	D	D	D	D	D	73	D
Oxalic Acid (Cold)	-	-	1.70	A	-	73	400	140	150	150	-	-	180	150
Paraffin	-	70	-	A	-	120	400	D	-	120	-	-	250	D
Pentane	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> CH <sub>3</sub>	-	-	-	-	-	400	-	-	-	-	-	100	D
Perchloroethylene	CL <sub>2</sub> CCCL <sub>2</sub>	70	1.60	-	-	D	-	-	150	D	-	-	200	D
Petrolatum	-	-	-	-	-	140	300	-	-	120	-	-	100	D
Phenol 10%	C <sub>6</sub> H <sub>5</sub> OH	10	-	A	B	A	A	-	-	-	-	-	B	D
Phenol (Carbolic Acid)	C <sub>6</sub> H <sub>5</sub> OH	-	1.10	-	-	D	350	D	200	73	A	D	200	70
Phosphoric Acid	H <sub>3</sub> PO <sub>4</sub>	-	1.80	-	-	140	400	140	140	180	-	-	200	100
Phosphoric Acid 10%	H <sub>3</sub> PO <sub>4</sub>	10	-	-	-	140	400	140	140	180	-	-	200	100
Phosphoric Acid 20%	H <sub>3</sub> PO <sub>4</sub>	20	-	-	-	140	400	140	140	180	-	-	200	70
Phosphoric Acid 40%	H <sub>3</sub> PO <sub>4</sub>	40	-	-	-	140	300	140	250	180	-	-	200	70
Phosphoric Acid 80%	H <sub>3</sub> PO <sub>4</sub>	80	-	-	-	140	350	70	250	180	-	-	200	70
Phosphoric Acid 85%	H <sub>3</sub> PO <sub>4</sub>	85	-	-	-	140	350	70	200	180	-	-	200	70
Phosphoric Acid 100%	H <sub>3</sub> PO <sub>4</sub>	100	1.80	-	-	-	350	-	-	-	-	-	100	70
Phosphoric Acid (Crude)	H <sub>3</sub> PO <sub>4</sub>	-	1.83	-	-	-	350	-	-	-	-	-	100	70
Phosphoric Anhydride (Dry or Moist)	C <sub>6</sub> H <sub>4</sub> (CO) <sub>2</sub> O	-	-	A	-	D	A	-	-	-	A	-	D	-
Phosphoric Anhydride (Molten)	P <sub>2</sub> O <sub>5</sub>	-	-	A	-	D	A	D	-	-	-	-	D	-
Photographic (Developer)	-	-	-	-	-	140	350	D	250	150	A	A	190	-
Phthalic Anhydride	-	-	1.53	-	-	D	350	-	-	D	-	-	-	-
Picric Acid	C <sub>6</sub> H <sub>2</sub> (NO <sub>2</sub> ) <sub>3</sub> OH	-	1.77	-	A	D	400	D	70	D	-	-	190	140
Plating sol, Antimony Plating 130Å° F	-	-	-	-	-	140	-	140	240	250	-	-	140	-
Plating sol, Arsenic Plating 110Å° F	-	-	-	-	-	140	300	140	240	150	-	-	100	-
Plating, Brass - Regular Brass Bath 100Å° F	-	-	-	-	-	140	300	140	240	180	-	D	150	70
Plating, Brass - High Speed Brass Bath 110Å° F	-	-	-	A	A	A	A	-	-	A	-	C	A	-
Plating, Bronze - Copper-Cadmium Bronze Bath R.T.	-	-	-	A	A	A	A	-	-	A	-	C	A	-
Plating, Bronze - Copper - Tin Bronze Bath 160Å° F	-	-	-	A	A	D	A	-	-	A	-	D	A	-
Plating, Bronze - Copper - Zinc Bronze Bath 100Å° F	-	-	-	A	A	A	A	-	-	A	-	C	A	-

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
A number in the block indicates that product is acceptable to the temperature, which is in degrees F.





# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc. % Concentration	Hastelloy C 316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Plating, Cadmium - Cyanide Bath 90Å° F	-	-	-	-	140	250	140	240	D	-	-	180	70
Plating, Cadmium - Fluoborate Bath 100Å° F	-	-	-	A	A	A	-	-	A	-	D	A	-
Plating, Chromium - Chromic - Sulfuric Bath 130Å° F	-	-	-	C	A	A	A	-	-	A	-	A	C
Plating, Chromium - Fluosilicate Bath 95Å° F	-	-	-	C	A	A	A	-	-	A	-	B	C
Plating, Chromium - Fluoride Bath 130Å° F	-	-	-	D	A	A	A	-	-	A	-	B	C
Plating, Chromium - Black Chrome Bath 115Å° F	-	-	-	C	A	A	A	-	-	A	-	A	C
Plating, Chromium - Barrel Chrome Bath 95Å° F	-	-	-	D	A	A	A	-	-	A	-	A	C
Plating, Copper (Cyanide) - Copper Strike Bath 120Å° F	-	-	-	-	A	-	A	-	-	-	-	C	B
Plating, Copper (Cyanide) - Rochelle Salt Bath 150Å° F	-	-	-	A	A	D	A	-	-	A	-	D	A
Plating, Copper (Cyanide) - High Speed Bath 180Å° F	-	-	-	A	A	D	A	-	-	A	-	D	A
Plating, Copper (Acid) - Copper Sulfate Bath R.T.	-	-	-	D	A	A	A	-	-	A	-	D	A
Plating, Copper (Acid) - Copper Fluoborate Bath 120Å° F	-	-	-	D	A	A	A	-	-	A	-	D	A
Plating, Copper (Misc.) - Copper Pyrophosphate 140Å° F	-	-	-	A	A	A	A	-	-	A	-	B	A
Plating, Copper (Misc.) - Copper (Electroless) 140Å° F	-	-	-	-	-	A	A	-	-	A	-	D	A
Plating, Gold - Cyanide 150Å° F	-	-	-	A	A	D	A	-	-	A	-	B	A
Plating, Gold - Neutral 75Å° F	-	-	-	C	A	A	A	-	-	A	-	A	A
Plating, Gold - Acid 75Å° F	-	-	-	C	A	A	A	-	-	A	-	A	A
Plating, Indium - Indium Sulfamate Plating R.T.	-	-	-	C	A	A	A	-	-	A	-	A	A
Plating, Iron - Ferrous Chloride Bath 190Å° F	-	-	-	D	D	D	A	-	-	C	-	A	A
Plating, Iron - Ferrous Sulfate Bath 150Å° F	-	-	-	C	A	D	A	-	-	A	-	A	A
Plating, Iron - Ferrous Am. Sulfate Bath 150Å° F	-	-	-	C	A	D	A	-	-	A	-	A	A
Plating, Iron - Sulfate -Chloride Bath 160Å° F	-	-	-	D	D	D	A	-	-	A	-	A	A
Plating, Iron - Fluoborate Bath 145Å° F	-	-	-	D	B	D	A	-	-	A	-	D	A
Plating, Iron - Sulfamate 140Å° F	-	-	-	D	B	A	A	-	-	A	-	A	A

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Plating, Nickel -Watts Type 115 -160Å° F	-	-	-	C	A	D	A	-	-	A	-	A	A	-
Plating, Nickel - High Chloride 130 -160Å° F	-	-	-	C	A	D	A	-	-	A	-	A	A	-
Plating, Nickel - Fluoborate 100 -170Å° F	-	-	-	C	A	D	A	-	-	A	-	D	A	-
Plating, Nickel - Sulfamate 100 - 140Å° F	-	-	-	C	A	A	A	-	-	A	-	A	A	-
Plating, Nickel - Electroless 200Å° F	-	-	-	-	-	D	A	-	-	D	-	A	A	-
Plating, Rhodium - Rhodium Plating 120Å° F	-	-	-	D	D	A	A	-	-	A	-	A	A	-
Plating, Silver - Silver Plating 80-120Å° F	-	-	-	A	A	A	A	-	-	A	-	B	A	-
Plating, Tin Fluoborate - 100Å° F	-	-	-	C	A	A	A	-	-	A	-	D	A	-
Plating, Tin - Lead - 100Å° F	-	-	-	C	A	A	A	-	-	A	-	D	A	-
Plating, Zinc - Acid Chloride 140Å° F	-	-	-	D	D	A	A	-	-	A	-	A	A	-
Plating, Zinc - Acid Sulfate Bath 150Å° F	-	-	-	C	A	D	A	-	-	A	-	A	A	-
Plating, Zinc - Acid Fluoborate Bath R.T.	-	-	-	-	-	A	A	-	-	A	-	D	A	-
Plating, Zinc - Alkaline Cyanide Bath R.T.	-	-	-	-	A	A	A	-	-	A	-	D	A	-
Potash	K <sub>2</sub> CO <sub>3</sub>	-	-	-	-	140	400	250	180	-	-	200	-	-
Potassium Bicarbonate	KHCO <sub>3</sub>	-	2.20	-	-	140	400	-	250	180	A	A	200	150
Potassium Bromide 30%	KBr	30	2.70	-	-	140	300	-	250	180	-	-	200	150
Potassium Carbonate	-	-	2.40	-	-	140	300	-	250	180	-	-	200	160
Potassium Chlorate	KLCO <sub>3</sub>	30	2.30	A	-	140	300	-	250	180	-	-	180	140
Potassium Chloride	KCL	-	2.00	-	-	140	350	-	250	180	-	-	200	200
Potassium Chromate	K <sub>2</sub> CrO <sub>4</sub>	-	2.70	-	-	140	-	-	250	180	A	D	100	170
Potassium Cyanide Solutions	KCN	-	1.50	-	-	140	350	-	250	100	C	A	190	140
Potassium Dichromate	K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub>	10	2.70	-	-	140	350	-	250	180	-	-	180	170
Potassium Ferrocyanide	K <sub>4</sub> Fe(CN) <sub>6</sub>	-	1.90	-	-	140	350	-	250	140	-	-	180	140
Potassium Hydroxide 25%	KOH	25	-	-	-	140	350	-	140	180	-	-	-	200
Potassium Hydroxide 10%	KOH	10	-	-	-	140	350	-	D	100	-	-	-	200
Potassium Nitrate	KNO <sub>3</sub>	-	2.10	-	A	140	350	-	250	150	-	-	180	210
Potassium Permanganate	KMNO <sub>4</sub>	20	2.70	B	B	140	350	-	250	120	A	A	150	210
Potassium Sulfate	K <sub>2</sub> SO <sub>4</sub>	-	2.70	-	-	140	400	-	250	180	A	A	200	180
Potassium Sulfide	K <sub>2</sub> S	-	1.80	-	-	100	300	-	250	-	-	-	100	-
Propane (Liquified)	C <sub>3</sub> H <sub>8</sub>	-	-	-	-	72	300	-	250	73	-	-	300	D
Propylene Glycol	CH <sub>3</sub> CHOHCH <sub>2</sub> OH	-	1.00	-	-	-	400	D	250	-	-	-	200	-
Pyridine	N(CH) <sub>4</sub> CH	-	1.00	B	-	D	350	-	D	73	-	-	D	70
Pyrogallic Acid	C <sub>6</sub> H <sub>3</sub> (OH) <sub>3</sub>	-	1.47	-	-	73	350	-	150	-	-	-	80	-

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	Hastelloy C 316 SS	Hastelloy C	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM
Rosins	-	-	-	-	-	-	350	-	-	-	-	-	-	-
Rum	-	-	-	-	-	100	-	-	-	100	-	-	70	-
Rust Inhibitors	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Salad Dressing	-	-	-	-	-	-	-	-	-	-	A	A	-	-
Sea Water	-	-	-	-	A	140	400	140	250	180	A	A	280	250
Shellac (Bleached)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shellac (Orange)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silicone	-	-	-	-	-	140	350	-	250	250	A	A	190	140
Silver Bromide	AgBr	-	6.47	-	-	-	140	-	-	-	A	-	-	-
Silver Nitrate	AgNO <sub>3</sub>	-	4.32	-	-	140	350	140	350	180	A	A	250	200
Soap Solutions	-	-	-	-	-	140	350	D	280	180	A	A	200	200
Soda Ash (See Sodium Carbonate)	Na <sub>2</sub> CO <sub>3</sub>	-	1.55	-	-	140	400	-	280	180	-	-	250	140
Sodium Acetate	NaC <sub>2</sub> H <sub>3</sub> O <sub>2</sub>	-	1.50	-	A	140	350	140	250	180	A	A	D	170
Sodium Aluminate	Na <sub>2</sub> AL <sub>2</sub> O <sub>4</sub>	-	-	-	A	-	-	-	-	-	A	A	200	200
Sodium Bicarbonate	NaHCO <sub>3</sub>	-	2.20	-	A	140	400	140	280	180	A	A	300	210
Sodium Bisulfate	NaHSO <sub>4</sub>	-	2.40	-	-	140	250	140	280	180	A	A	250	200
Sodium Bisulfite	NaHSO <sub>3</sub>	-	1.50	-	A	140	350	140	250	180	-	-	250	200
Sodium Borate	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub>	-	1.70	-	A	100	300	140	250	200	A	A	180	140
Sodium Carbonate	Na <sub>2</sub> CO <sub>3</sub>	-	1.55	-	A	140	350	-	250	180	B	A	200	140
Sodium Chlorate	NaClO <sub>3</sub>	-	2.50	-	-	100	350	-	250	180	A	A	180	140
Sodium Chloride	NaCl	-	2.20	-	A	140	350	140	280	180	-	-	200	140
Sodium Chromate	Na <sub>2</sub> CrO <sub>4</sub>	-	-	-	-	-	-	-	200	-	-	-	70	70
Sodium Cyanide	NaCN	-	-	-	-	140	350	-	250	180	-	-	200	140
Sodium Fluoride	NaF	-	2.60	-	-	140	350	-	250	180	-	-	140	140
Sodium Hydrosulfite	Na <sub>2</sub> S <sub>2</sub> O <sub>6</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium Hydroxide 20%	NaOH	20	-	-	-	140	350	D	73	180	-	-	100	210
Sodium Hydroxide (50% Solution)	NaOH	50	2.10	-	-	140	350	D	D	180	-	-	D	180
Sodium Hydroxide (80% Solution)	NaOH	80	-	D	B	A	A	C	-	A	C	D	B	-
Sodium Hypochlorite 3 to 20%	NaOCL	15	-	-	-	140	300	-	100	72	-	-	180	D
Sodium Hypochlorite	NaOCL	-	-	-	-	140	300	140	100	120	-	-	140	70
Sodium Hyposulfate	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium Metaphosphate	(NaPO <sub>3</sub> ) <sub>n</sub>	-	-	-	-	140	-	-	250	150	-	-	180	70
Sodium Metasilicate	Na <sub>2</sub> SiO <sub>3</sub>	-	-	-	-	140	350	-	250	180	-	-	200	-
Sodium Nitrate	NaNO <sub>3</sub>	-	2.30	-	-	140	400	-	250	180	A	A	210	200
Sodium Nitrate	NaNO <sub>3</sub>	-	2.20	-	-	140	400	-	250	180	A	A	200	170
Sodium Perborate	NaBO <sub>3</sub>	-	-	-	-	140	350	-	250	180	-	-	180	70
Sodium Peroxide	Na <sub>2</sub> O <sub>2</sub>	10	2.80	-	-	140	350	-	200	180	-	-	180	140
Sodium Polyphosphate	-	-	-	-	-	140	350	120	250	180	A	A	200	150
Sodium Silicate	Na <sub>2</sub> OSiO <sub>2</sub>	-	-	-	-	140	350	-	250	180	A	A	200	200
Sodium Sulfate	Na <sub>2</sub> SO <sub>4</sub>	-	2.70	-	-	140	400	140	280	150	A	A	200	140
Sodium Sulfide	Na <sub>2</sub> S	50	1.40	-	-	140	350	140	250	180	A	A	200	140

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc.	% Concentration	Hastelloy C 316 SS	PVC	Teflon	Polyethylene	Polypropylene	PVDF	Carbon	Ceramic	Viton	EPDM	
Sodium Sulfite	Na <sub>2</sub> SO <sub>3</sub>	-	2.60	A	B	140	350	140	250	180	A	A	200	140
Sodium Tetraborate	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub>	-	-	-	-	140	300	140	250	120	A	A	140	100
Sodium Thiosulphate ("Hypo")	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	-	1.70	-	-	140	350	140	250	180	A	A	200	-
Sorghum	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Soy Sauce	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stannic Chloride	Na <sub>2</sub> SnCl <sub>6</sub>	-	2.30	D	-	140	350	-	280	150	A	A	200	100
Stannic Fluoborate	-	-	-	-	-	-	-	-	-	-	A	A	-	-
Stannous Chloride	SnCl <sub>2</sub>	-	-	A	-	140	350	-	250	180	-	-	200	100
Starch	-	-	1.51	-	-	140	350	140	250	180	A	A	200	140
Stearic Acid	-	-	0.84	-	-	140	350	-	250	120	-	-	80	D
Stoddard Solvent	-	-	-	B	-	D	300	-	250	70	A	A	180	D
Styrene	C <sub>6</sub> H <sub>5</sub> CH:CH <sub>2</sub>	-	0.90	-	-	D	250	-	200	D	-	-	D	D
Sugar (Liquids)	-	-	-	-	-	140	350	-	270	180	-	-	200	140
Sulfate Liquors	-	-	-	-	-	140	200	-	150	150	-	-	80	70
Sulfur Chloride	S <sub>2</sub> CL <sub>2</sub>	-	1.69	-	-	140	-	-	250	D	-	-	80	D
Sulfur Dioxide	SO <sub>2</sub>	-	-	-	-	100	300	70	250	180	-	-	140	140
Sulfur Dioxide (Dry)	SO <sub>2</sub>	-	-	-	-	140	300	70	250	180	-	-	100	70
Sulfur Trioxide (Dry)	SO <sub>3</sub>	-	-	-	-	D	-	-	D	D	-	-	150	D
Sulfuric Acid 10%	H <sub>2</sub> SO <sub>4</sub>	10	-	D	A	140	350	140	250	180	A	A	200	140
Sulfuric Acid 30%	H <sub>2</sub> SO <sub>4</sub>	30	-	D	A	140	350	140	250	150	-	-	200	140
Sulfuric Acid 50%	H <sub>2</sub> SO <sub>4</sub>	50	-	D	A	140	350	140	200	150	-	-	200	140
Sulfuric Acid 60%	H <sub>2</sub> SO <sub>4</sub>	60	-	D	A	140	350	D	200	140	-	-	200	140
Sulfuric Acid 70%	H <sub>2</sub> SO <sub>4</sub>	70	-	D	B	140	350	D	200	140	-	-	200	140
Sulfuric Acid 80%	H <sub>2</sub> SO <sub>4</sub>	80	-	C	B	140	350	D	200	D	-	-	200	70
Sulfuric Acid 90%	H <sub>2</sub> SO <sub>4</sub>	90	-	C	B	73	350	D	200	D	-	-	200	D
Sulfuric Acid 95%	H <sub>2</sub> SO <sub>4</sub>	95	-	B	B	D	350	D	180	D	-	-	200	D
Sulfuric Acid 98%	H <sub>2</sub> SO <sub>4</sub>	98	1.84	B	B	D	350	D	140	D	-	-	200	D
Sulfuric Acid 100%	H <sub>2</sub> SO <sub>4</sub>	100	-	B	B	D	-	D	D	D	-	-	100	D
Sulfurous Acid	H <sub>2</sub> SO <sub>3</sub>	-	1.03	B	B	140	350	140	250	170	-	-	180	D
Sulfuryl Chloride	SO <sub>2</sub> CL <sub>2</sub>	-	1.67	B	-	-	-	-	-	-	-	-	D	-
Syrup	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tallow	-	-	0.86	-	-	-	-	D	-	-	-	-	-	-
Tannic Acid	C <sub>76</sub> H <sub>52</sub> O <sub>46</sub>	-	-	B	-	140	250	D	250	180	-	-	100	70
Tanning Liquors	-	-	-	B	-	140	250	-	68	73	A	A	200	-
Tartaric Acid	-	-	1.80	-	-	140	250	140	250	140	-	-	180	D
Tetrachlorethane	CHCL <sub>2</sub> CHCL <sub>2</sub>	-	-	-	-	D	350	-	250	D	-	-	70	D
Tetrahydrofurane*	-	-	-	D	-	350	D	D	D	-	-	-	D	D
Toluene, Toluol*	CH <sub>3</sub> C <sub>6</sub> H <sub>5</sub>	-	0.90	A	A	D	350	D	150	D	A	A	70	D
Tomato Juice	-	-	-	B	B	140	400	70	250	150	-	-	200	200
Trichlorethane	CHCL <sub>2</sub> CH <sub>2</sub> CL	-	-	-	-	D	350	-	-	D	-	-	-	D
Trichlorethylene	CHCL <sub>2</sub> CCL <sub>2</sub>	-	1.10	-	-	D	350	D	170	68	-	-	200	D
Trichloropropane	-	-	1.39	-	-	-	-	-	-	-	-	-	-	-
Tricresylphosphate	(CH <sub>3</sub> C <sub>6</sub> H <sub>4</sub> O) <sub>3</sub> PO	-	1.16	-	-	D	-	-	-	-	-	-	-	-
Triethylamine	(C <sub>2</sub> H <sub>5</sub> ) <sub>3</sub> N	-	-	-	-	73	-	-	70	72	-	-	200	73

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.

# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc. % Concentration	316 SS	Hastelloy C	PVC	Teflon	Polyethylene	PVDF	Polypropylene	Carbon	Ceramic	Viton	EPDM	
Turpentine*	C <sub>10</sub> H <sub>16</sub>	-	0.90	A	B	D	300	D	250	D	-	-	108	D
Urine	-	-	-	-	-	140	350	140	250	180	-	-	180	140
Vegetable Juice	-	-	-	A	B	140	400	-	200	140	-	-	300	140
Vinegar	-	-	-	B	C	140	400	140	200	140	-	-	180	140
Varnish (Use VitonÅ® - (D for Aromatic)	-	-	-	-	-	-	250	-	250	-	-	-	68	D
Water, Acid, Mine	-	-	-	A	A	140	400	-	280	150	A	A	180	250
Water, Distilled, Lab Grade	H <sub>2</sub> O	-	-	-	A	140	400	140	280	180	A	A	180	250
Water, Fresh	H <sub>2</sub> O	-	-	-	A	140	400	140	280	180	A	A	180	250
Water, Salt	H <sub>2</sub> O	-	-	-	A	140	400	140	280	180	A	A	180	250
Weed Killers	-	-	-	A	-	-	-	-	-	-	A	A	A	-
Whey	-	-	-	-	-	-	-	-	-	-	A	A	-	-
Whiskey and Wines	-	-	-	A	-	A	A	B	-	A	A	A	A	A
White Liquor (Pulp Mill)	-	-	-	B	-	140	350	-	250	180	A	A	180	-
White Water (Paper Mill)	H <sub>2</sub> O	-	-	A	-	-	-	-	-	A	A	A	A	-
Xylene*	C <sub>6</sub> H <sub>4</sub> (CH <sub>3</sub> ) <sub>2</sub>	-	0.90	-	-	D	350	D	250	D	A	A	180	D
Zinc Chloride	ZnCL2	-	2.90	-	-	140	350	140	250	180	A	A	200	180
Zinc Hydrosulphite	-	-	-	A	-	-	-	-	-	-	A	A	-	A
Zinc Hydrosulfate	-	-	-	A	B	C	A	B	A	A	A	A	A	A
Zinc Sulfate	ZnSO <sub>4</sub>	-	2.00	-	-	140	400	140	50	180	A	A	200	180

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.



# Chemical Resistance Chart

Chemical	Formula	Est. Sp. Grav @ 100% Conc. % Concentration	316 SS	Hastelloy C	PVC	Teflon	Polyethylene	PVDF	Polypropylene	Carbon	Ceramic	Viton	EPDM

\* Indicates that pumping or mixing these chemicals with a drum pump can cause sparks of static electricity. This condition can cause explosion and/or fire. A stainless steel tube with M6X (Air) or X series (Electric) motor is recommended. A static protection kit must also be used. A properly grounded centrifugal metal pump may be used with these solutions. Do not use a plastic pump for flammable solutions. Always take operating conditions and solutions into account when selecting a pump and motor.

**A** - Acceptable    **B** - Acceptable - Minor effect    **C** - Questionable - Some effect    **D** - Not recommended  
 A number in the block indicates that product is acceptable to the temperature, which is in degrees F.