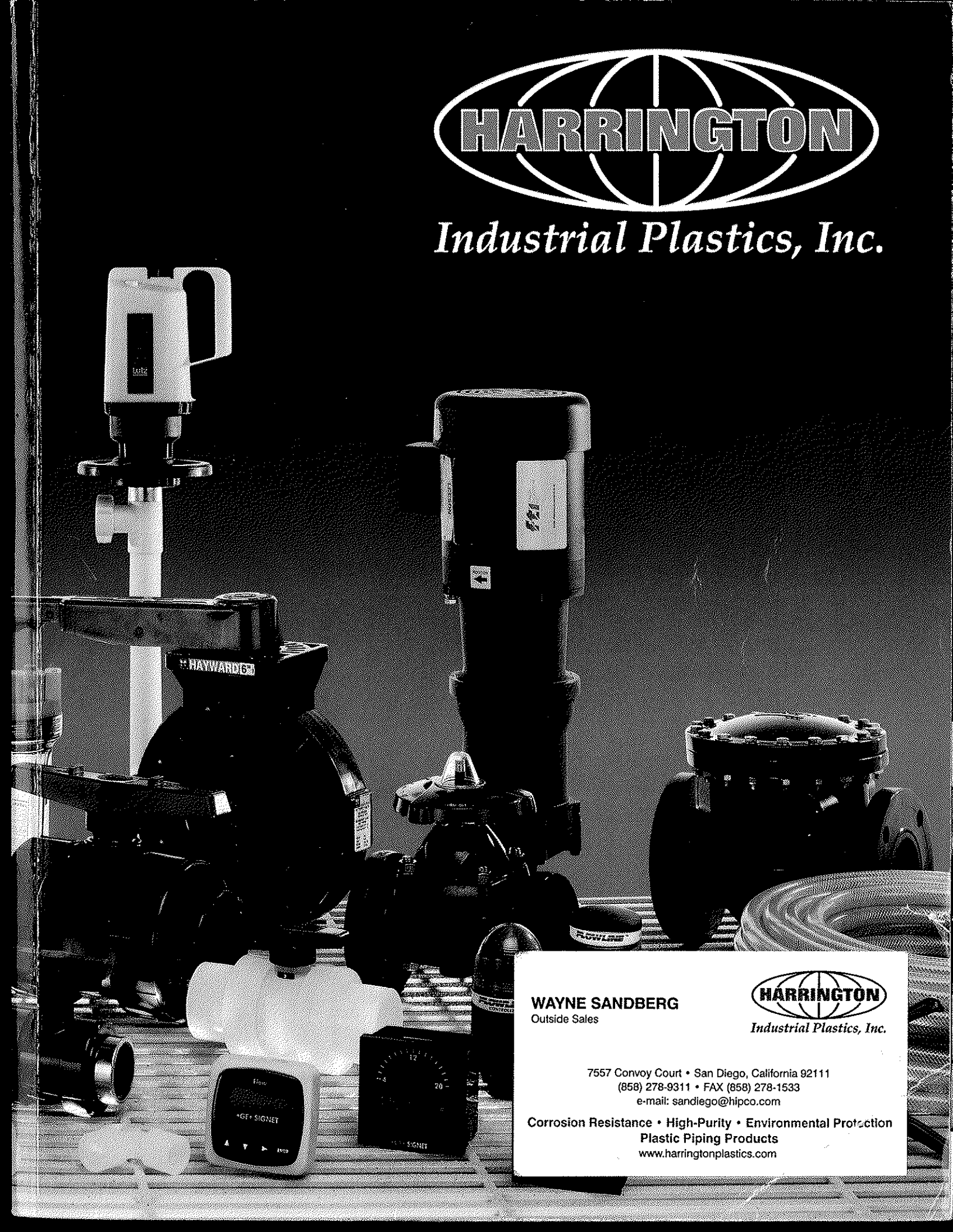

WAYNE SANDBERG
Outside Sales

HARRINGTON
Industrial Plastics, Inc.

7557 Convoy Court • San Diego, California 92111
(858) 278-9311 • FAX (858) 278-1533
e-mail: sandiego@hipco.com

Corrosion Resistance • High-Purity • Environmental Protection
Plastic Piping Products
www.harringtonplastics.com

CHEMICAL RESISTANCE GUIDE

For over forty years, Harrington Industrial Plastics, Inc. has been dedicated to the simple premise of providing our customers with a better way of handling corrosive liquids. This premise, together with our commitment to redefine customer service, built Harrington into the largest distributor of industrial plastic piping in the United States.

Over the years, we have constantly sought to provide new and better products as they become available and are consistent with our goal of selling the best at the most economical cost.

INTRODUCTION

Engineers must carefully select materials for vessels, piping, pumps and gaskets when designing systems for handling corrosive chemicals. With a relatively recent awareness of environmental issues, engineers' jobs take on a new emphasis.

Designing a system for a specific application usually involves referring to several sources on piping, tanks, pumps and elastomer seals. Until the advent of synthetics, such as plastics, choices were limited to various grades of metal and alloys. Now the field is greatly expanded. Harrington has tried in this Chemical Resistance Guide to provide a single resource, of non-metallic and high-purity steel products based on manufacturers' recommendations and our own extensive experience. It is important to note that these tables should be used only as a guide. In many cases a physical test of the material under actual operating conditions is the only way to ensure the success of a particular material for the application.

Corrosion is defined as a gradual wearing away. This is an accurate definition when dealing with metals. With non-metallic materials, such as plastics, there is no rate of corrosion; they are either resistant or they deteriorate completely from a chemical compatibility stand point. However, it must be remembered that mechanical stresses will limit the useful life of a piping system. In the case of poor chemical resistance the failure of the piping system is hastened by mechanical stress.

Metals tend to form a passive film on the surface to resist corrosion. Rust is a chemical reaction that forms iron oxide on iron and steel. Stainless steel is frequently treated with dilute nitric acid to produce an oxide layer on the surface which makes the material more resistant to chemical attack. While this surface layer slows the corrosive degradation, metals still exhibit a penetration rate of the aggressive chemical. An A-rating for metals means that the rate of penetration is <2 mils per year. A B-rating means that the rate is <20 mils per years and with a C-rating means the rate can be estimated at <50 mils per year.

Metals are listed as:

A = Excellent
B = Good, minor effect
C = Fair, needs further test
X = Unsuitable

Corrosion is a function of temperature. Higher temperatures generally hasten the reaction that results in material failure. In the tables provided here, temperatures shown are the maximum that can be used for the specified plastic in the particular chemical application. Plastics also have low temperature limitations at which they may be used successfully. These tables do not address this issue; however, Harrington welcomes your specific inquires.

There are many variables that contribute to the successful use of a particular material, whether it is metal or plastic. There are many different plastic compounds and formulations. A material determined suitable for a specific chemical application does not mean that the compounds of that plastic from all manufacturers can be considered suitable. A dash means we lack sufficient data.

To the best of our knowledge, the information contained in this publication is accurate. However, we do not assume any liability whatsoever for the accuracy or completeness of such information. Moreover, there is a need to reduce human exposure to many materials to the lowest physical limits in view of possible long-term adverse effects. To the extent that any hazards have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones that exist. Final determination of suitability of any information or product for the use contemplated by any user, the manner of that use, and whether there is any infringement of patents, is the sole responsibility of the user. We recommend that anyone intending to rely on any recommendation, or use of any equipment, processing technique, or material mentioned in this publication should satisfy themselves as to suitability, and that all applicable safety and health standards are met. We strongly recommend the user seek and adhere to manufacturers' or suppliers' current instructions for handling each material they use.

USE OF THE CHEMICAL REFERENCE TABLES

The aggressive agents are classified alphabetically according to their most common designation. Further descriptions include trivial and common names as trade names.

If several concentrations are given for a particular material, the physical data, in general, relates to the pure product that is 100% concentration.

In listing the maximum use temperature for each plastic type in a given chemical, it can, in general, be assumed that the resistance will be no worse at lower temperature.

HOW TO SELECT THE CORRECT MATERIAL:

1. Locate the specific chemical in the system or found in the surrounding atmosphere using the alphabetical chart of chemicals.

2. Select the material with a maximum use temperature that matches or exceeds the need. The Harrington philosophy has always been to suggest the least costly material that will do the job.

3. Where a material or elastomer appears to be marginal compared to the requirements, we encourage a call to our technical service group.

EXAMPLES:

1. Methylene chloride: in the tables PVDF, Halar, or PTFE are the only materials suitable. Carbon steel works well for chlorinated hydrocarbons of this sort, and that would be our choice unless there was another reason to justify the higher cost of PVDF, PTFE, or Halar.

2. Sodium hypochlorite, 15% at 100°F: PVC is good to 140°F and is the least expensive of the materials available, however, you must use 724 CPVC cement for this and caustic applications.

3. For nitric acid, 40% at ambient temperature, the tables recommend either CPVC or polypropylene at 73°F. In most cases CPVC will be the economical choice. Note that PVDF is rated for higher temperature use.

Note: The ratings shown for carbon and ceramic pump seals are approximate.
Please contact your local Harrington service center for a recommendation on your specific application.

Chemical Resistance Guide

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ploy vinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploy ethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Acetaldehyde	CH_3CHO	-	-	X	X	100	120	X	X	X	-	350	150	X	X	100	200	X	X	A	A	A	A	A	A
Acetaldehyde, Aqueous	-	40	-	X	X	100	120	X	X	-	-	350	150	X	X	100	200	X	100	A	A	A	A	A	A
Acetamide	CH_3CONH_2	-	-	-	-	100	73	150	-	-	-	-	-	-	-	200	200	X	100	-	A	B	A	-	
Acetate Solvents, Crude	-	-	-	X	X	-	78	-	-	X	-	350	-	-	-	X	X	X	X	A	A	B	A	-	B
Acetate Solvents, Pure	-	-	-	X	X	-	X	-	-	X	-	350	-	-	-	X	X	X	X	-	-	B	A	-	-
Acetic Acid*	CH_3COOH	5	-	140	140	200	140	X	140	68	250	350	150	200	-	X	200	100	-	-	-	A	A	A	A
Acetic Acid*	CH_3COOH	10	-	140	140	200	140	X	140	68	250	350	150	200	-	180	200	X	X	-	-	A	A	A	A
Acetic Acid*	CH_3COOH	20	-	140	140	200	140	X	140	X	250	350	X	200	-	180	200	X	X	-	-	A	A	A	A
Acetic Acid*	CH_3COOH	30	-	140	140	200	140	X	140	X	250	350	-	100	-	180	200	-	-	-	-	A	A	A	A
Acetic Acid*	CH_3COOH	50	-	100	100	200	100	X	140	X	250	350	X	100	-	180	200	X	X	-	-	A	A	A	A
Acetic Acid*	CH_3COOH	60	-	73	73	150	100	X	140	X	-	350	X	X	-	180	100	X	X	-		A	A	A	A
Acetic Acid*	CH_3COOH	80	-	X	X	140	73	X	70	X	212	350	X	X	-	180	100	X	X	-	-	A	A	A	A
Acetic Acid*, Glacial	CH_3COOH	100	1.05	X	X	70	180	X	70	X	212	350	X	X	-	X	73	X	X	A	A	A	A	A	A
Acetic Anhydride	$(CH_3CO)_2O$	-	-	X	X	73	90	X	X	X	73	-	X	X	-	X	200	X	X	A	A	-	-	-	-
Acetic Ether (See Ethyl Acetate)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetol (Hydroxy 2 Proponone)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	A	A	A
Acetone	CH_3COCH_3	-	-	X	X	-	X	-	-	-	150	-	-	-	-	-	-	-	-	-	-	A	A	A	A
Acetonitrile (Methyl Cyanide)	CH_3CN	-	0.8	X	X	X	150	X	X	X	212	400	X	X	-	X	-	X	X	-	-	A	A	A	A
Acetophenone	$C_6H_5COCH_3$	-	-	X	X	150	200	-	-	X	121	400	120	X	-	X	-	-	X	-	-	A	A	-	B
Acetyl Benzene	$C_6H_5COCH_3$	-	1.03	X	X	73	73	-	-	X	-	-	X	X	-	X	-	X	X	-	-	-	A	-	-
Acetyl Bromide	CH_3COBr	-	-	X	X	-	-	-	-	X	-	-	X	X	-	X	-	X	X	-	-	-	A	-	-
Acetyl Chloride (dry)	CH_3COCL_3	-	-	-	-	-	100	X	X	X	150	-	X	X	-	-	X	-	-	-	-	-	A	-	-
Acetyl Propane	-	-	-	X	X	130	100	-	-	X	-	200	-	-	-	X	-	X	X	-	-	A	A	-	-
Acetylene	-	-	-	100	100	-	200	-	-	-	150	-	-	-	-	-	-	-	-	A	A	-	A	-	B
Acetylene Dichloride	CLHC:CHLC	-	-	X	X	-	X	-	-	X	-	300	-	-	-	150	-	-	-	-	-	-	-	-	-
Acid Mine Water	-	-	-	100	150	150	250	-	-	-	-	350	-	-	-	-	-	-	-	-	-	-	-	-	-
Acrylic Acid	$CH_2CHCOOH$	-	-	X	X	X	100	X	X	X	212	170	X	X	-	-	-	-	-	-	-	-	-	-	-
Acrylic Emulsions*	-	-	-	-	-	-	-	X	70	-	-	-	-	-	-	X	X	X	X	-	-	A	-	-	A
Acrylonitrile	H_2CCHCN	-	-	X	X	73	100	140	140	X	73	350	100	X	-	250	200	160	180	A	A	B	-	-	B
Adipic Acid Aqueous	-	-	-	140	180	100	250	140	140	-	150	350	-	-	-	-	-	-	-	-	-	A	A	A	A
Alcohol (See Ethyl Alcohol)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alcohol, Allyl	-	-	-	80	80	140	200	100	140	X	-	250	200	100	-	200	70	100	180	-	-	A	-	-	A
Alcohol, Amyl	$C_5H_{11}OH$	-	-	100	100	170	250	140	140	X	250	400	200	100	-	190	200	140	140	-	-	A	-	-	A
Alcohol, Benzyl	$C_6H_5CH_2OH$	-	-	X	X	120	180	-	-	X	250	-	-	-	-	140	X	140	X	-	-	A	-	-	A
Alcohol, Butyl	-	-	-	140	180	180	240	140	140	X	250	250	200	100	-	100	180	140	140	-	-	A	-	-	A
Alcohol, Diacetone	-	-	-	X	-	73	73	-	-	X	150	350	-	-	-	X	70	X	-	-	-	A	-	-	A
Alcohol, Ethyl	C_2H_5OH	-	-	140	*	180	750	140	140	X	250	300	180	-	-	170	170	170	200	A	A	A	-	-	A
Alcohol, Hexyl	-	-	-	100	70	70	-	-	-	X	73	-	-	-	-	160	X	70	70	A	A	A	-	-	A
Alcohol, Isobutyl	$(CH_3)_2CHCH_2OH$	-	-	-	-	-	250	-	-	X	-	300	180	100	-	140	140	70	70	A	A	A	-	-	A
Alcohol, Isopropyl	CH_3OH	-	-	140	*	150	230	140	140	X	250	300	180	100	-	200	140	70	200	A	A	A	-	-	-
Alcohol, Methyl	-	-	-	140	150	150	230	140	140	X	250	300	150	-	-	100	100	140	140	A	A	A	-	-	A
Alcohol, Polyvinyl	-	-	-	140	180	180	250	-	-	68	-	280	150	100	-	210	100	-	-	A	A	A	-	-	-
Alcohol, Propargyl	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	-
Alkanes	-	-	-	140	100	100	250		-	-	-	300	-	-	-	210	X	X	X	-	-	A	-	-	-
Allyl Aldehyde	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allyl Bromide	C_3H_5Br	-	-	X	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Allyl Chloride	C_3H_5CL	-	-	X	X	100	200	100	-	X	250	350	-	-	-	100	X	X	X	-	-	A	-	-	-
Alum (See Aluminum Sulfate)	$AL_2(SO_4)_3$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alum, Ammonium	-	-	-	140	140	200	220	140	140	176	250	400	270	200	-	180	-	X	180	-	-	-	-	-	-
Alum, Chrome	-	-	-	120	160	180	250	140	140	176	150	400	270	200	-	180	140	80	180	-	-	B	-	-	-
Alum, Potassium	$ALK(SO_4)_2$	-	-	140	140	180	280	140	140	176	250	400	270	200	-	180	200	80	180	-	-	A	-	-	-
Aluminum, Acetate	-	-	-	100	100	100	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonium Sulfate	-	-	-	-	-	200	220	-	-	176	250	-	-	-	-	80	-	140	140	-	-	-	-	-	-
Aluminum, Bromide	$ALBr_3$	-	-	-	-	-	250	-	-	176	-	-	-	-	-	180	-	-	140	-	-	-	-	-	-

* Caution: Further testing needed, suspect with certain stress levels.

Note: Recent studies have shown that surfactants and detergents even in trace quantities can adversely affect the performance of certain thermoplastics in applications like sodium hydroxide, e.g. cross-linked polyethylene and CPVC.

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ployvinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ployethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Aluminum, Chloride	$ALCL_3$	-	-	140	170	170	140	140	140	176	250	210	-	200	-	180	210	200	200	A	A	C	-	-	-
Aluminum, Citrate	-	-	-	-	-	-	-	140	140	-	-	-	180	180	-	-	-	-	-	-	-	-	-	-	-
Aluminum, Fluoride	ALF_3	-	-	140	160	200	280	160	-	176	250	-	-	-	-	180	-	200	200	-	-	-	-	-	-
Aluminum, Formate	$AL(HCOO)_3$	-	-	140	180	180	250	-	-	-	-	280	-	-	-	250	210	160	180	-	-	B	-	-	-
Aluminum, Hydroxide	$AL(0H)_3$	-	-	140	180	180	250	-	-	176	250	250	-	-	-	180	150	160	180	-	-	-	A	B	-
Aluminum, Nitrate	$AL(NO_3)_3$	-	-	140	180	180	200	140	140	176	250	210	250	180	-	200	200	200	200	A	A	-	-	-	-
Aluminum, Phosphate	$ALPO_4$	-	-	-	-	-	-	140	140	176	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum, Potassium Sulfate (Known as Potash Alum)	-	-	-	140	140	180	280	140	140	176	250	400	270	200	-	-	200	150	180	-	-	-	-	-	-
Aluminum, Salts	-	-	-	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum, Sulfate	$AL_2(SO_4)_3$	-	-	140	180	180	280	-	-	176	250	250	270	300	-	-	210	160	200	A	A	-	-	A	A
Amines	-	15	-	-	-	-	-	-	-	176	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia	NH_3	25	-	140	180	180	210	-	-	176	-	250	-	-	-	70	-	-	140	-	-	-	-	-	-
Ammonia	NH_3	99	-	140	180	180	210	-	-	176	-	250	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia, Gas	NH_3	-	-	X	X	100	180	-	-	-	-	250	-	-	-	X	120	-	180	-	-	A	A	-	A
Ammonia, Anhydrous	-	-	-	X	X	180	250	160	-	-	-	400	X	-	-	-	-	200	180	C	A	-	-	-	-
Ammonium Hydroxide	NH_4OH	-	-	140	X	180	250	150	-	176	300	400	150	100	-	X	200	80	X	-	-	-	A	-	A
Ammonium, Nitrate	NH_4NO_3	-	-	140	190	180	250	140	140	176	250	350	230	200	-	X	200	160	180	-	-	-	-	-	-
Ammonium Phosphate Monobasic	$NH_4H_2PO_4$	-	-	140	180	180	250	140	140	176	250	250	200	150	-	180	120	140	100	-	-	A	-	-	A
Ammonium Phosphate Tribasic	-	-	-	140	180	180	250	140	140	-	-	250	200	150	-	180	200	140	100	-	-	A	-	-	A
Ammonium, Acetate	-	-	-	140	180	180	-	-	-	-	150	350	-	-	-	X	140	X	-	-	-	B	-	-	-
Ammonium, Alum (See Aluminum Ammonium Sulfate)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonium, Bichromate	$(NH_4)_2Cr_2O_7$	-	-	73	-	-	250	-	-	-	-	-	-	-	-	70	100	100	100	-	-	-	-	-	-
Ammonium, Bifluoride	NH_4HF_2	-	-	140	180	180	250	-	-	-	250	300	-	-	-	140	-	X	80	-	-	A	-	-	-
Ammonium, Bisulfide	NH_4HS	-	-	140	180	-	250	-	-	-	250	300	-	-	-	-	-	-	180	-	-	-	-	-	-
Ammonium, Carbonate	NH_4HCO_3	-	-	140	180	200	250	140	140	68	250	250	180	100	-	200	200	200	200	-	-	A	-	-	-
Ammonium, Casenite	-	-	-	-	-	-	-	140	140	-	-	-	180	100	-	-	-	-	-	-	-	-	-	-	-
Ammonium, Chloride	NH_4CL	-	-	140	180	180	250	140	140	176	250	250	270	200	-	220	-	200	180	A	A	B	-	-	-
Ammonium, Dichromate	$(NH_4)_2Cr_2O_7$	-	-	73	-	-	250	-	-	-	73	-	-	-	-	70	100	100	100	-	-	-	-	-	-
Ammonium, Fluoride	NH_4F	10	-	100	-	180	250	-	-	176	250	-	-	-	-	140	-	200	100	-	-	-	-	-	-
Ammonium, Fluoride	NH_4F	20	-	100	-	180	250	-	-	176	-	-	-	150	-	140	-	-	100	-	-	-	-	-	-
Ammonium, Fluoride	NH_4F	25	-	X	-	-	-	-	-	176	250	-	-	-	-	140	-	200	100	-	-	-	-	-	-
Ammonium, Fluoride	NNH_4F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonium, Hydroxide	NH_4OH	-	-	140	X	180	250	150	-	176	300	400	150	100	-	X	200	80	X	A	A	A	-	-	A
Ammonium, Metaphosphate	-	-	-	140	180	-	-	140	140	-	250	-	200	150	-	180	-	200	200	-	-	-	-	-	-
Ammonium, Nitrate	NH_4NO_3	-	-	140	180	180	160	140	140	176	400	250	230	200	-	180	-	200	180	A	A	A	-	-	-
Ammonium, Oxalate	$(NH_4)_2C_20_4$	-	-	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	A	-	-	-	-	-
Ammonium, Persulfate	$(NH_4)_2S_2O_8$	-	-	140	150	180	200	140	140	176	150	-	-	180	73	76	-	200	200	-	-	X	A	-	-
Ammonium, Phosphate	$NH_4H_2PO_4$	-	-	140	180	180	250	140	140	176	250	250	200	150	-	180	-	200	200	A	A	A	-	-	-
Ammonium, Phosphate Dibasic	$(NH_4)_2HPO_4$	-	-	140	180	180	250	140	140	-	-	300	-	200	150	180	210	100	100	A	A	A	-	-	-
Ammonium, Phosphate Monobasic	$NH_4H_2PO_4$	-	-	140	180	180	250	140	140	-	-	-	350	200	150	190	210	100	100	A	A	A	-	-	A
Ammonium, Phosphate Tribasic	-	-	-	140	180	180	250	140	140	-	-	-	200	150	-	190	210	100	100	A	A	A	-	-	A
Ammonium, Salts	-	-	1.8	140	180	180	250	140	140	-	-	350	200	150	-	180	210	160	180	A	A	B	-	-	-
Ammonium, Sulfate	$(NH_4)_2SO_4$	-	1.8	140	180	180	250	140	140	176	250	-	350	200	150	180	210	160	140	A	A	B	-	-	A
Ammonium, Sulfide	$(NH_4)_2S$	-	1.3	140	180	180	250	140	140	-	250	-	350	200	150	-	210	160	140	-	-	B	-	-	-
Ammonium, Thiocyanate	NH_4SCN	-	1.3	140	180	-	280	140	140	176	-	-	300	150	100	200	180	140	150	-	-	A	-	-	A
Ammonium, Thiosulfate	$(NH_4)_2S_2O_3$	-	0.86	140	180	-	250	140	140	-	-	-	300	150	100	200	180	140	150	A	A	A	-	-	-
Amyl, Acetate	$CH_3COOC_5H_{11}$	-	0.86	X	X	X	180	X	X	X	150	400	140	100	X	X	70	X	X	A	A	A	A	A	A
Amyl, Alcohol (See Alcohol Amyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amyl Bromate	-	-	-	-	-	-	-	-	-	-	-	-	250	-	-	X	X	-	70	-	-	-	-	-	-
Amyl Bromide	-	-	0.8	-	-	-	250	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amyl Chloride	-	-	1.02	X	X	X	240	X	X	X	250	-	100	X	X	68	X	X	X	A	A	B	B	-	-
Aniline	$C_6H_5NH_2$	-	1.02	X	X	100	200	X	70	X	121	400	250	X	X	140	70	X	X	A	A	A	-	-	-
Aniline Chlorohydrate	-	-	-	X	X	-	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CHEMICAL RESISTANCE GUIDE

				Plastics													Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ployvinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ployethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Aniline Hydrochloride	$C_6H_5NH_2HCL$	20	-	X	X	100	140	-	-	-	-	400	X	140	-	180	-	-	-	-	-	X	X	A	X
Anisole	$C_2H_5OCH_3$	-	1	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthraquinone Sulfonic Acid	-	-	-	100	180	X	240	100	-	X	150	400	-	-	-	180	-	-	-	-	-	-	-	-	-
Anti-Freeze (See Ethylene Glycol)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony Chloride (See Antimony Trichloride)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony Pentachloride	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150	-	-	-	-	-	-	-	-	-	-
Antimony Trichloride	$SbCL_3$	-	-	140	180	180	100	140	140	-	-	-	250	200	-	190	140	140	140	-	-	X	X	-	-
Aqua Ammonia (See Ammonia Hydroxide)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aqua Regia	HNO_3	20	-	X	X	X	200	X	X	X	250	380	X	X	150	140	X	X	X	-	X	X	-	-	C
Aqua Regia	HCL	80	-	X	X	X	200	X	X	X	250	380	X	X	150	140	X	X	X	-	X	X	-	-	C
Aroclor 1248	-	-	-	-	-	-	-	-	-	-	-	300	-	-	-	-	-	-	-	A	-	-	-	-	-
Aromatic Hydrocarbons	-	-	-	X	X	68	40	-	-	X	-	-	250	-	-	180	X	X	X	A	-	-	-	-	-
Arsenic Acid	H_3AsO_4	80	-	100	180	140	210	140	140	-	250	-	250	180	-	210	150	160	160	A	A	A	A	-	A
Aryl Sulfonic Acid	-	-	-	X	X	X	X	-	-	X	-	-	-	-	180	-	-	-	-	-	-	-	-	-	-
Asphalt	-	-	-	X	X	140	250	-	-	X	-	-	250	-	-	180	X	X	70	-	A	A	-	-	-
Aviation Fuel	-	-	-	-	-	-	-	-	-	-	-	-	-	250	-	160	X	X	150	-	-	-	-	-	-
Aviation Turbine Fuel	-	-	-	-	-	-	-	-	-	X	-	250	180	50	180	-	-	-	-	-	-	-	-	-	-
Baking Soda (See Sodium Bicarbonate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium Acetate	-	-	-	-	-	-	-	140	140	-	-	-	-	180	150	-	-	-	-	-	-	-	-	-	-
Barium Carbonate	$BACO_3$	-	4.3	140	180	180	250	140	140	176	250	400	240	200	200	200	250	160	200	-	-	B	-	-	-
Barium Chloride	$BaCL_2$	-	3.1	140	180	180	250	140	140	176	250	400	-	200	200	300	250	160	200	-	-	B	-	-	-
Barium Cyanide	$Ba(CN)_2$	-	-	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium Hydrate	$Ba(OH)_2$	-	-	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium Hydroxide	$Ba(OH)_2$	-	2.2	140	180	180	250	140	140	176	250	400	-	200	150	200	200	140	200	A	A	A	-	-	-
Barium Nitrate	$Ba(NO3)_2$	-	-	80	180	140	250	140	140	176	73	400	250	-	-	300	200	140	200	A	A	A	-	-	-
Barium Salts	-	-	4.4	140	180	180	250	140	140	-	-	-	250	200	180	250	200	140	200	A	A	A	-	-	-
Barium Sulfate	$BaSO_4$	-	4.3	140	180	180	250	140	140	176	-	400	-	200	200	200	200	150	200	A	B	A	A	A	A
Barium Sulfide	BaS	-	-	140	180	200	280	150	-	-	250	400	-	200	180	250	140	150	200	A	A	A	A	-	-
Beer	-	-	-	140	180	180	250	-	-	68	250	400	-	200	-	200	200	140	200	A	A	A	A	A	A
Beet Sugar Liquid	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	-
Beet Sugar Liquors	-	-	1.05	100	150	180	230	-	-	-	150	-	80	180	-	180	-	80	80	-	-	-	-	-	-
Benzaldehyde	C_6H_5CHO	-	-	X	X	73	120	X	X	X	122	400	X	X	-	-	-	-	-	A	A	A	A	A	A
Benzene	C_6H_6	-	-	X	X	100	150	X	X	X	-	350	180	X	-	140	X	X	X	A	A	A	B	A	B
Benzene Sulfonic Acid	$C_6H_5SO_3H_4$	10	-	100	180	180	100	150	-	X	150	400	220	200	-	140	-	-	-	-	-	-	-	-	-
Benzene Sulfonic Acid	$C_6H_5SO_3H_4$	100	1.3	X	X	X	73	X	-	X	-	400	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzoic Acid	C6H5COOH	-	-	180	180	250	250	150	140	-	250	400	200	200	-	180	-	140	-	-	-	A	B	A	A
Benzol (see Benzene)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzyl Alcohol (see Alcohol, Benzyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzyl Benzoate	-	-	1.1	-	-	-	-	-	-	X	-	-	-	-	-	100	X	X	X	-	-	B	-	-	B
Benzyl Chloride	$C_6H_5CH_2CL$	-	6.8	-	-	73	250	-	-	X	-	400	-	73	-	200	X	-	X	-	-	-	-	-	-
Bismuth Carbonate	$(BiO)_2CO_3$	-	-	140	180	180	250	-	-	-	73	400	-	-	-	180	-	-	-	-	-	-	-	-	-
Black Liquor	-	-	-	140	190	140	200	120	-	100	250	400	200	150	-	180	-	80	180	-	-	-	-	-	-
Bleach-see Sodium Hypochlorite	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Borax, Sodium Borate	$Na_2B_4O_7$	-	1.4	140	180	180	250	140	140	176	250	400	250	200	-	180	-	200	180	A	A	A	A	A	-
Boric Acid	H_3BO_3	-	-	140	190	180	250	140	140	176	250	400	230	200	-	200	210	X	180	A	A	B	-	A	A
Brake Fluid	-	-	-	-	-	-	-	-	-	-	-	300	-	-	-	X	-	X	-	-	-	-	-	-	A
Brewery Slop	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150	-	A	A	-	-	-	-
Brine	-	-	-	140	190	180	280	140	140	176	-	-	270	200	-	300	250	-	180	A	A	A	-	-	-
Bromic Acid	$HBrO_3$	-	-	140	190	140	200	150	-	X	250	400	150	-	-	70	70	-	-	-	-	-	-	-	A
Bromine Dry	Br_2	-	-	-	-	X	200	X	X	X	-	-	X	X	-	X	-	-	-	-	-	-	-	-	-
Bromine Gas, Wet	-	-	3.1	-	-	-	-	X	X	X	-	-	-	-	-	X	-	X	-	X	-	-	-	-	-

				Plastics													Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ploy vinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploy ethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Bromine Liquid	-	-	-	X	X	X	140	X	X	X	150	400	X	-	-	190	X	X	X	-	-	-	-	-	-
Bromine Water	-	-	-	100	X	X	180	X	-	X	250	X	-	-	-	100	X	X	X	-	-	X	X	A	A
Bromobenzene	C_6H_5Br	-	-	X	X	-	150	-	-	X	73	-	-	-	-	150	X	-	X	-	-	-	-	-	-
Bromotoluene	$C_6H_5CH_2Br$	-	-	X	X	X	180	-	-	X	121	-	-	-	-	-	-	140	-	-	-	-	-	-	-
Butadiene Gas	-	-	0.8	140	-	X	250	X	-	-	-	-	150	-	-	190	X	140	X	-	-	A	-	-	A
Butane	C_4H_{10}	-	-	100	70	70	200	X	-	-	250	400	100	-	-	180	X	-	140	-	-	A	A	-	B
Butanol (see Alcohol, Butyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butter	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Buttermilk	-	-	-	-	-	-	-	-	-	68	-	-	-	-	-	-	-	X	-	-	-	A	A	-	-
Butyl Acetate	-	-	0.9	-	-	-	-	X	70	X	73	-	150	X	-	X	-	-	X	-	-	-	-	-	-
Butyl Acrylate Saturated	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylamine	$C_4H_9NH_2$	-	-	X	X	X	X	X	-	X	-	350	-	-	-	-	-	-	-	-	-	-	-	-	-
Butylbenzene	$C_6H_5C(CH_3)_3$	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl Bromide	C_4H_9Br	-	-	-	-	-	230	-	-	X	-	250	-	-	-	100	-	-	-	-	-	-	-	-	-
Butyl Butyrate (Butyl Butanoate)	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	A	-	-	A
Butyl Cellosolve	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl Chloride (Chlorobutane)	-	-	-	-	-	X	250	-	-	X	-	350	-	-	100	-	-	-	-	-	-	B	-	-	B
Butyl Ether	$C_4H_9OC_4H_9$	-	-	X	X	X	100	-	-	X	-	140	-	-	X	X	X	100	-	-	-	-	-	-	-
Butyl Formate	$HCOOC_4H_9$	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl Mercaptan	C_4H_9SH	-	-	-	-	-	230	-	-	X	-	350	-	-	-	-	-	-	-	-	-	-	A	-	-
Butyl Phenol	-	-	-	X	X	X	210	-	-	X	250	400	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl Phthalate	-	-	-	X	X	100	180	-	-	X	-	200	-	-	X	-	-	X	-	-	-	-	-	-	-
Butyl Stearate	-	-	-	-	-	-	250	-	-	-	73	250	-	-	190	100	X	100	-	-	-	A	-	-	-
Butylene (Liquified Petroleum Gas)	-	-	-	-	-	X	250	-	-	-	-	250	-	-	140	X	X	100	-	A	-	A	-	-	-
Butyraldehyde	-	-	-	-	-	-	-	-	-	X	-	-	150	-	X	X	X	X	-	-	-	A	-	-	A
Butyric Acid	-	-	-	X	100	180	220	X	-	X	250	-	200	180	70	X	X	X	-	X	-	B	-	A	A
Cadmium Cyanide	$Cd(CN)_2$	-	-	140	180	-	-	140	140	-	150	-	-	-	-	-	70	-	-	-	-	-	-	-	-
Cadmium Salts	-	-	-	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium Acetate	-	-	-	140	180	180	250	140	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium Bisulfide	$Ca(HS)_2$	-	-	120	160	200	210	140	X	-	250	400	-	-	180	X	100	140	-	A	A	B	-	A	A
Calcium Bisulfite	$Ca(HSO_3)_2$	-	-	100	140	200	210	-	-	-	250	210	270	200	180	X	100	100	-	-	A	-	-	-	-
Calcium Carbonate	$CaCO_3$	-	2.7	140	200	200	250	140	-	176	250	300	-	200	180	140	100	100	-	A	A	A	A	A	A
Calcium Chlorate	$Ca(CLO_3)_2$	-	2.7	140	180	200	250	140	-	176	250	400	200	200	180	140	73	73	-	A	-	A	A	-	B
Calcium Chloride	$CaCL_2$	-	2.1	140	200	200	250	140	140	176	250	350	270	200	180	200	150	100	-	A	A	B	B	A	A
Calcium Cyanide	$CaCN_2$	-	-	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium Hydroxide	$Ca(OH)_2$	-	2.3	140	180	210	250	140	-	176	250	400	100	180	200	180	70	140	-	A	A	A	A	A	A
Calcium Hypochlorite	$Ca(OCL)_2$	-	2.3	140	180	180	200	140	140	100	250	380	150	200	180	100	X	X	-	A	A	B	-	-	B
Calcium Nitrate	$Ca(NO_3)_2$	-	1.82	140	180	180	250	140	140	140	250	400	250	200	-	210	180	100	180	-	-	A	-	-	-
Calcium Oxide	CaO	-	-	140	180	180	250	140	-	150	250	400	-	-	-	-	210	160	180	-	-	A	-	-	-
Calcium Phosphate	$CaH_4(PO_4)_2$	-	2.3	-	-	-	-	140	140	-	-	-	150	-	-	-	-	-	-	-	-	-	-	-	-
Calcium Sulfate	$CaSO_4$	-	2.9	140	180	180	210	140	140	150	250	400	250	200	-	200	210	150	180	A	A	A	A	A	B
Calcium Sulfide	CaS	-	-	140	140	180	180	140	140	-	-	400	200	200	-	200	150	100	150	-	-	-	-	-	-
Calcium Thiosulfate	CaS_2O_3	-	1.87	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calgon (Sodium Hexametaphosphate)	-	-	-	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	-
Cane Sugar Liquors	-	-	-	140	180	140	250	140	-	150	150	350	-	-	-	200	250	150	150	A	A	A	A	-	A
Caprylic Acid (Octanic Acid)	$CH_3(CH_2)_6COOH$	-	-	140	180	150	220	-	-	X	150	350	X	200	-	-	-	-	-	A	A	-	-	-	-
Carbinol (see Alcohol, Methyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbolic Acid (see Phenol)	-	-	1.07	-	-	-	120	70	70	X	-	-	100	-	-	200	73	X	X	-	-	A	A	B	A
Carbon Bisulfide (see Carbon Disulfide)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Dioxide (wet or dry)	CO_2	-	-	140	180	180	250	140	140	90	250	350	200	200	-	210	170	150	180	-	-	A	A	A	A
Carbon Disulfide	CS_2	-	-	X	X	X	68	X	X	X	73	400	73	X	-	180	X	X	X	A	B	A	A	-	A
Carbon Monoxide	CO	-	-	140	180	180	250	140	140	140	150	400	200	200	-	180	-	200	180	A	A	A	A	-	-
Carbon Tetrachloride	CCL_4	-	1.6	X	X	X	140	X	X	X	250	350	150	-	-	190	X	X	X	A	A	A	C	A	A

Chemical Resistance Guide

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ployvinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ployethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hasteloy C	Titanium
Carbonic Acid	H_2CO_2	-	-	140	210	210	250	140	140	-	250	350	180	140	-	200	210	79	180	A	A	A	A	-	A
Casein	-	-	-	-	-	-	50	-	-	-	-	250	-	-	-	180	180	-	-	-	-	-	-	-	-
Castor Oil	-	-	0.95	140	*	150	250	140	140	140	250	350	220	200	-	140	140	100	140	-	-	A	A	-	A
Catsup	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	-	A
Caustic Lime -Calcium Hydroxide	$Ca(OH)_2$	-	-	140	180	200	250	-	-	176	250	250	100	180	-	210	210	70	140	A	A	A	-	-	A
Caustic Potash (Potassium Hydroxide)	KOH	-	2.04	140	180	200	140	-	-	-	-	200	180	150	-	X	200	150	70	-	-	A	-	-	-
Caustic Soda (Sodium Hydroxide)	NaOH	-	2.13	140	180	200	100	X	140	-	-	250	120	100	-	X	200	140	180	-	-	A	-	-	-
Cellosolve (see Butyl Cellosolve)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloral Hydrate (knockout drops)	$CCL_3CH(OH)_2$	-	1.9	140	160	X	200	-	-	-	121	200	-	-	-	X	-	-	X	-	-	-	C	-	-
Chloroacetic Acid	$CH_2CLCOOH$		-	-	X	-	-	X	X	X	212	300	100	200	-	X	-	X	X	-	-	C	C	-	-
Chloric Acid	$HClO_3$	20	-	140	180	140	-	-	-	-	-	140	-	-	-	100	-	-	-	-	-	C	X	-	A
Chlorine Dioxide	CLO_2	15	-	73	73	X	200	-	-	X	150	140	X	150	-	140	X	X	X	-	-	-	X	-	-
Chlorine Gas Dry	CL_2	-	-	X	X	X	250	X	X	X	212	350	X	150	-	140	X	X	X	A	A	-	-	-	-
Chlorine Gas Wet	-	-	-	X	X	X	-	X	X	X	212	-	X	200	-	140	X	X	X	-	-	A	-	-	A
Chlorine Liquid	-	-	-	X	X	X	200	X	X	X	212	400	-	-	-	140	-	-	X	-	-	C	-	-	A
Chlorine Water	-	-	-	140	180	-	250	-	-	-	212	400	-	200	-	180	73	X	X	C	A	-	-	-	-
Chlorosulfonic Acid	$CLSO_2OH$	6	1.77	X	X	X	X	X	X	-	73	180	-	X	-	X	X	X	X	-	-	X	-	-	-
Chlorox Bleach	$NaOCL:H_2O$	5.5	-	140	140	140	140	143	140	-	212	350	X	150	-	140	100	73	73	-	-	X	B	X	-
Chocolate Syrup	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	100	-	100	-	-	-	-	A	-	B
Chrome Alum (Chr. Potass. Sulf.)	$CrK(SO_4)_2$	-	-	73	73	140	200	140	140	176	-	210	200	200	-	210	140	160	150	-	-	A	-	-	-
Chromic Acid	H_2CrO_4	5	2.8	140	180	140	250	140	140	X	250	400	X	200	-	180	73	X	-	X	C	B	A	-	-
Chromic Acid	H_2CrO_4	10	-	140	180	140	250	140	140	X	212	400	X	100	-	180	73	X	-	X	-	A	-	-	A
Chromic Acid	H_2CrO_4	20	-	140	180	X	250	140	140	X	212	400	X	100	-	140	73	X	-	X	-	B	B	-	A
Chromic Acid	H_2CrO_4	30	-	100	180	X	200	100	140	X	212	400	X	X	-	300	-	-	140	X	-	B	-	-	A
Chromic Acid	H_2CrO_4	50	-	X	73	-	180	100	140	X	212	350	X	X	-	300	-	-	140	X	-	C	B	A	B
Citric Acid	-	-	1.54	140	180	180	240	140	140	176	250	200	250	200	-	200	200	200	-	-	-	-	-	-	-
Citric Oils	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	-
Cobalt Chloride	$CoCL_2$	-	3.35	-	-	100	-	-	-	176	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-
Coconut Oil	-	-	-	-	-	100	250	140	140	-	250	250	-	-	-	340	-	-	200	-	-	-	-	-	-
Coffee	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	200	140	-	100	A	A	A	A	-	-
Coke Oven Gas	-	-	-	X	-	-	230	-	-	X	250	400	-	-	-	180	-	180	X	A	A	A	A	-	-
Cola Concentrates	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	-
Copper Acetate	$Cu(C_2H_3O_2)_2$	-	-	73	-	73	250	-	-	-	-	250	180	180	-	X	150	X	73	-	A	B	A	-	B
Copper Carbonate	$Cu_2(OH)_2CO_3$	-	-	140	170	180	250	140	-	176	150	350	-	-	-	190	210	-	-	-	A	A	-	-	-
Copper Chloride	$CuCL_3$	-	3.4	140	190	180	250	-	-	176	300	350	250	200	-	200	210	160	180	-	A	C	C	A	A
Copper Cyanide	$Cu(CN)_2$	-	-	140	190	180	200	140	-	176	300	300	220	200	-	190	200	160	180	A	A	A	A	B	A
Copper Fluoborate	-	-	-	100	190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper Fluoride	CuF_2	-	2.9	140	170	140	250	140	-	176	300	350	-	-	-	190	210	140	70	-	A	-	-	-	-
Copper Nitrate	$Cu(NO_3)_2$	-	2.3	140	140	180	210	140	-	176	300	350	250	-	-	200	210	160	70	-	A	A	-	-	-
Copper Salts	-	-	-	140	140	180	210	140	140	-	-	350	220	200	-	210	200	140	140	-	A	-	-	-	-
Copper Sulfate	$CuSO_4$	-	2.3	140	180	180	210	140	140	176	300	350	220	200	-	210	200	140	140	-	A	A	-	-	-
Copper Sulfate	$CuSO_4$	5	-	140	180	180	210	140	140	176	300	350	220	200	-	210	200	140	140	A	A	A	-	-	-
Corn Oil	-	-	-	73	180	100	250	-	-	X	-	400	-	-	-	200	X	200	180	-	A	A	-	-	-
Corn Syrup	-	-	-	140	73	150	250	-	-	-	-	400	220	180	-	210	100	100	100	-	A	A	-	-	-
Cottonseed Oil	-	-	-	140	180	180	250	X	140	X	-	400	-	-	-	300	X	150	180	-	A	A	-	-	-
Cream	-	-	-	-	190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Creosol	$CH_3C_6H_4OH$	-	1.05	X	-	X	180	X	70	-	-	400	-	-	-	100	X	X	X	A	A	A	-	-	-
Creosote	-	-	-	X	X	-	-	-	-	X	-	400	-	-	-	100	X	X	70	-	-	-	-	-	-
Cresols	-	-	-	X	X	X	180	-	-	X	-	400	-	-	-	100	X	X	X	-	-	A	-	-	-
Cresylic Acid	-	-	-	X	X	X	150	-	-	X	150	-	X	X	-	200	X	X	X	A	A	A	-	-	-
Croton Aldehyde	$CH_3CHCHCHO$	-	-	X	X	73	180	-	-	X	73	210	-	-	-	100	-	-	X	-	-	A	-	-	-
Crude Oil	-	-	-	140	X	73	250	-	-	-	250	350	250	200	-	300	X	70	70	-	-	A	-	-	-
Cryolite	Na_3ALF_6	-	-	140	190	180	250	-	-	-	-	300	-	-	-	200	100	100	70	-	-	-	-	-	-
Cupric Cyanide	$Cu(CN)_2$	-	-	140	190	180	200	140	-	176	300	300	220	200	-	190	200	160	180	A	A	A	A	B	A

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ployvinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ployethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Cupric Fluoride	CuF_2	-	-	140	-	180	250	-	-	176	-	250	250	-	-	200	210	-	-	-	-	-	-	-	-
Cupric Nitrate	$Cu(NO_3)_2$	-	-	140	170	180	250	140	-	176	-	-	-	-	-	200	210	160	180	-	A	-	-	-	-
Cupric Salts	-	-	-	140	170	150	250	-	-	-	-	-	-	-	-	200	210	-	180	-	A	-	-	-	-
Cupric Sulfate (see Copper Sulfate)	$CuSO_4$	-	-	140	180	180	210	140	140	176	250	400	220	200	-	210	200	140	140	-	A	A	-	-	-
Cyanic Acid (Isocyanic Acid)	HN=C=0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	A	A	-	-
Cyclohexane	-	-	-	X	X	X	210	X	-	X	250	400	150	120	-	180	X	X	X	A	A	A	A	-	-
Cyclohexanol	C_6H_{12}	-	0.94	X	X	100	210	140	-	X	121	400	150	-	-	180	-	-	-	-	-	-	-	-	-
Cyclohexanone	$C_6H_{11}OH$	-	0.95	X	X	X	100	X	X	X	121	400	X	100	-	X	X	-	X	-	-	-	-	-	-
Decalin	$C_6H_{10}O$	-	-	X	X	180	250	-	-	X	-	-	-	-	-	73	X	X	X	-	-	-	-	-	-
Decane	$CH_3(CH_2)_8CH_3$	-	-	-	-	-	250	-	-	-	-	250	-	-	-	100	X	X	X	-	-	-	-	-	-
Detergents	-	-	-	140	180	180	250	X	140	-	250	400	180	150	-	210	200	160	180	A	A	-	A	-	-
Detergents, Heavy Duty	-	-	-	140	180	150	150	X	140	-	250	400	180	150	-	180	-	-	180	A	A	-	-	-	-
Dextrin, Starch Gum	-	-	-	140	200	180	250	140	140	176	250	400	-	-	-	210	200	200	180	-	-	-	A	-	-
Dextrose (Glucose)	-	-	-	140	200	180	250	140	140	176	250	400	-	-	-	210	200	70	180	-	-	-	A	-	-
Diacetone Alcohol	-	-	-	X	X	100	100	-	-	-	121	350	-	-	-	X	70	X	X	-	-	-	A	-	A
Diallyl Phthalate	-	-	-	-	-	-	-	-	-	X	-	-	180	180	-	-	-	-	-	-	-	-	-	-	-
Diazo Salts	-	-	-	140	190	180	240	140	140	-	-	350	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzyl Ether	-	-	-	X	X	X	100	-	-	X	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-
Dibutylamine	$(C_4H_9)_2NH$	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibutyl Ether	-	-	-	-	-	-	100	-	-	X	73	350	-	-	-	X	X	X	68	-	-	-	-	-	-
Dibutyl Phthalate	$C_6H_4(COOC_4H_9)_2$	-	-	X	X	73	150	-	-	X	73	350	180	180	-	X	70	X	X	-	-	-	A	-	-
Dibutyl Sebacate	-	-	-	-	-	-	-	-	-	X	212	-	-	-	-	X	-	-	-	-	-	-	-	-	-
Dicalcium Phosphate	CaHPO	-	-	-	-	-	-	-	-	-	-	-	150	120	-	-	-	-	-	-	-	-	-	-	-
Dichlorethane (ethylene dichloride)	$ClCH_2CH_2CL$	-	-	X	X	X	210	X	X	X	73	400	-	-	-	150	-	X	-	C	A	-	A	-	-
Dichlorobenzene	$C_6H_4CL_2$	-	-	X	X	100	140	-	-	X	121	350	120	X	-	150	X	X	X	-	-	-	B	-	-
Dichloroethylene	CLHC:CHCL	-	1.25	X	X	X	120	-	-	X	73	350	-	-	-	190	X	X	X	-	-	-	-	-	-
Dichloroisopropyl (Ether)	-	-	-	X	X	X	100	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloromethane	CH_2CL_2	-	-	X	X	X	100	-	-	X	-	-	-	-	-	-	X	X	X	A	A	-	-	-	-
Diesel Fuel	-	-	-	72	72	100	250	-	70	X	250	400	250	150	-	190	X	X	100	A	A	-	-	-	-
Diethanolamine	-	-	1.1	X	X	-	-	-	-	104	-	100	X	X	-	-	-	-	70	-	-	-	-	-	-
Diethyl Cellosolve	-	-	-	-	-	80	280	-	-	X	250	-	-	-	-	200	X	100	140	-	-	A	-	-	-
Diethylether (Ether)	$(C_2H_5)_2O$	-	-	X	X	100	100	73	-	X	73	400	100	X	-	X	X	X	X	-	-	-	-	-	-
Diethyl Ketone	$C_2H_5COC_2H_5$	-	-	X	X	-	-	-	-	X	-	-	-	X	-	X	-	X	200	-	-	-	-	-	-
Diethyl Oxide (Ether)	$(C_2H_5)_2O$	-	-	-	-	-	-	-	-	X	73	-	-	-	-	X	X	X	X	-	-	-	-	-	-
Diethylamine	$(C_2H_5)_2NH$	-	-	X	X	100	100	-	-	X	73	400	-	-	-	X	120	X	X	-	-	-	A	-	-
Diethylbenzene	$C_6H_4(C_2H_5)_2$	-	-	X	X	X	-	-	-	X	-	-	-	-	-	150	X	X	X	-	-	-	A	-	-
Diethylene Glycol	-	-	-	140	200	180	280	-	-	X	-	350	200	180	-	200	-	150	140	A	A	-	A	A	-
Diethylenetriamine	-	-	-	-	-	80	100	-	-	-	-	400	X	X	-	-	-	-	-	-	-	-	-	-	-
Diglycolic Acid	$0(CH_2COOH)_2$	-	-	140	190	100	80	-	-	-	73	400	-	-	-	-	-	-	-	-	-	-	A	-	-
Dimethyl Phthalate	-	-	-	X	X	X	68	-	-	X	212	-	100	100	-	200	-	-	-	-	-	-	-	-	-
Disobutyl Ketone	-	-	-	X	X	-	140	-	-	X	-	-	-	-	-	X	X	-	70	-	-	-	-	-	-
Diisobutylene	C_8H_{16}	-	-	-	-	-	180	-	-	-	-	250	-	-	-	140	X	-	-	-	-	-	A	-	-
Diisopropyl Ketone	-	-	-	-	-	-	68	-	-	-	73	70	-	-	-	X	70	-	-	-	-	-	-	-	-
Dimethylbenzene	$C_6H_4(CH_3)_2$	-	-	X	X	X	140	-	-	X	-	250	-	-	-	100	X	X	X	-	-	-	-	-	-
Dimethyl Ether	CH_3OCH_3	-	0.66	X	X	-	-	-	-	X	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-
Dimethylformamide	$HCON(CH_3)_2$	10	0.95	X	X	120	X	100	-	X	-	140	-	-	-	X	-	-	-	-	-	-	A	-	-
Dimethyl Ketone (see Acetone)	CH_3COCH_3	-	-	X	X	-	-	-	-	X	-	-	-	-	-	X	-	X	X	-	-	-	-	-	-
Dimethyl Phthalate	$C_6H_4(COOCH_3)_2$	-	-	X	X	100	100	-	-	X	73	350	100	100	-	200	-	X	X	-	-	-	A	-	-
Dimethylamine	$(CH_3)_2NH$	-	-	X	X	-	-	-	-	X	73	-	X	X	-	X	X	-	-	-	-	-	-	-	-
Dioctyl Phthalate	-	-	-	X	X	X	73	X	X	X	73	-	-	-	-	-	-	X	X	-	-	-	A	-	-
Dioxane	-	-	-	X	X	73	X	73	-	X	150	350	-	-	-	X	-	X	X	-	-	-	A	A	A
Dioxolane	-	-	1.07	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-
Diphenyl (Dowlherm)	-	-	1	-	-	-	-	-	-	X	-	350	120	120	-	300	X	150	X	-	-	-	-	-	-
Diphenyl Ether (see Diphenyl Oxide)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Chemical Resistance Guide

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ployvinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ployethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Diphenyl Oxide	$(C_6H_5)_2O$	-	-	-	-	-	-	-	-	X	-	-	120	-	-	100	X	X	X	A	A	-	A	-	-
Dipropylene Glycol	-	-	1.25	140	180	120	280	-	-	X	-	-	200	150	-	250	210	160	180	A	A	-	A	-	-
Disodium Methylarsonate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Disodium Phosphate	-	-	-	140	180	180	180	140	140	-	300	350	-	-	-	80	210	80	100	-	-	A	-	-	-
Distilled Water	HOH	-	-	140	210	180	250	140	140	176	300	350	250	200	-	-	250	250	180	-	-	A	-	-	-
Divinylbenzene	-	-	-	X	X	X	X	-	-	X	73		-	-	-	-	-	-	-	-	-	-	-	-	-
Dolomite	$CaMg(CO_3)_2$	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dowtherm (See Diphenyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dry Cleaning Solvents	-	-	-	X	X	73	250	X	X	-	-	350	120	X	-	200	X	X	X	-	-	A	-	A	-
Epichlorohydrin	-	-	-	X	X	80	220	-	-	X	-	350	-	-	-	X	X	-	X	-	-	-	-	A	-
Epsom Salts	$MgSO_4$	-	-	140	200	180	280	140	140	176	250	300	270	200	-	200	180	160	180	140	-	A	-	-	-
Esters (General)	-	-	-	X	X	X	100	-	-	-	-	350	100	-	-	-	-	-	-	-	-	-	-	-	-
Ethane	C_2H_5	-	-	73	73	X	280	-	-	-	-	350	-	-	-	-	X	-	-	-	-	A	-	-	-
Ethanol (see Alcohol, Ethyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethanolamine	-	-	1.02	X	X	X	X	-	-	-	-	100	-	-	-	-	100	-	68	-	-	A	-	-	-
Ethers	-	-	-	X	X	X	100	-	-	-	-	350	-	-	-	X	X	X	X	-	-	A	A	-	-
Ethyl Acetate	$CH_3COOL_2H_5$	-	-	X	X	100	100	X	X	X	121	350	150	X	-	X	70	X	X	A	A	A	A	-	-
Ethyl Acetoacetate	-	-	-	X	X	-	120	-	-	X	73	350	-	-	-	X	-	-	X	-	-	-	-	-	-
Ethyl Acrylate	-	-	-	X	X	73	120	-	-	X	121	350	-	-	-	X	-	X	X	-	-	-	C	-	-
Ethyl Alcohol	C_2H_5OH	-	0.8	140	180	180	250	120	140	X	250	300	180	80	-	180	170	70	180	-	-	A	A	-	-
Ethylbenzene	$C_6H_5C_2H_5$	-	-	X	X	X	140	-	-	X	-	300	-	-	-	70	X	X	X	-	-	-	-	-	-
Ethyl Bromide	C2H5BR	-	-	X	X	X	180	X	X	X	-	350	-	-	-	-	70	70	-	-	-	A	-	-	-
Ethyl Butyrate	$C_3H_7CO_2C_2H_5$	-	-	X	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethyl Cellosolve	-	-	-	-	-	-	-	-	-	X	-		150	X	-	-	-	-	-	-	-	-	-	-	-
Ethyl Chloride (Chloroethane)	C_2H_5CL	-	0.92	X	X	X	250	X	X	X	250	350	X	X	-	140	70	70	X	A	A	A	-	-	-
Ethyl Ether	$(C_2H_5)_2O$	-	-	X	X	X	100	X	X	X	121	200	100	X	-	X	X	X	X	-	-	A	A	-	-
Ethyl Formate	$HCOOC_2H_5$	-	-	X	X	X	X	-	-	X	73	200	-	-	-	X	70	-	X	-	-	-	-	-	-
Ethyl Hexanol	-	-	-	-	-	-	250	-	-	-	-	250	-	-	-	-	X	X	-	-	-	-	-	-	-
Ethyl Sulfate	$(C_2H_5)_2SO_4$	-	-	-	-	-	-	-	-	-	-		-	-	-	X	-	-	X	-	-	X	-	-	-
Ethylcellulose	-	-	-	-	-	-	-	-	-	176	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylene Bromide	$(CH_2)_2Br_2$	-	-	X	X	X	150	X	X	X	250	400	-	-	-	73	X	X	X	-	-	A	A	B	A
Ethylene Chlorohydrin	$(CH_2)_2CLOH$	-	-	X	X	140	150	X	X	X	73	-	150	100	-	150	-	-	X	-	-	-	-	-	-
Ethylene Diamine	$(CH_2)_2(NH_2)_2$	-	-	X	X	190	90	100	-	-	73	350	X	X	-	150	-	80	150	-	-	-	A	-	-
Ethylene Dichloride (Dichloroethane)	$CLCH_2CH_2CL$	-	1.25	X	X	X	200	X	X	X	73	-	120	X	-	150	X	X	X	C	A	A	-	-	-
Ethylene Glycol	CH_2OHCH_2OH	-	1.12	140	*	180	200	140	140	176	250	400	200	200	-	300	180	150	200	-	-	A	-	-	-
Ethylene Oxide	$(CH_2)_2O$	-	0.9	X	X	X	200	70	70	X	250	400	X	X	-	X	X	X	X	-	-	-	-	-	-
Fatty Acids	-	-	-	140	140	140	250	X	140	-	250	250	230	200	-	180	X	-	180	-	-	-	-	-	-
Ferric Acetate (Iron Acetate, Basic)	$Fe(C_2H_3O_2)_2OH$	-	-	-	-	-	-	140	140	-	-	-	200	180	-	X	-	-	-	-	-	-	-	-	-
Ferric Chloride	$FeCL_3$	-	2.9	140	190	180	250	140	140	X	250	400	220	200	-	210	200	160	180	A	A	X	X	A	C
Ferric Hydroxide	$Fe(OH)_3$	-	-	140	180	180	-	140	-	-	-	250	-	-	-	160	180	100	180	-	-	-	-	-	-
Ferric Nitrate	$FeNO_3$	50	1.7	140	190	180	250	140	140	176	250	400	220	200	-	180	180	100	100	-	-	B	A	-	-
Ferric Sulfate	$Fe(SO4)_3$	-	3.1	140	180	180	250	140	140	68	250	400	220	200	-	190	210	200	180	C	A	B	-	-	-
Ferrous Chloride	$FeCL_2$	-	3.2	140	180	180	250	140	140	-	250	400	220	200	-	200	200	80	200	A	A	X	X	A	A
Ferrous Nitrate	-	-	-	140	180	180	250	140	-	-	250	400	220	200	-	200	180	200	200	-	-	-	-	-	-
Ferrous Sulfate	$FeSO_4$	-	1.9	140	190	180	280	140	140	140	250	400	220	200	-	200	180	200	200	A	A	A	A	B	A
Fish Solubles	-	-	-	140	190	180	250	X	140	140	-	400	-	-	-	-	-	-	200	-	-	-	-	-	-
Fluoboric Acid	HBF_4	-	1.8	140	190	140	200	140	140	-	73	250	200	200	-	200	160	100	170	-	-	B	-	-	-
Fluorine Gas, wet	F_2	-	-	X	X	X	80	X	X	X	73	200	X	X	-	X	-	-	-	X	-	-	-	-	-
Fluorine, Liquid	F_2	-	-	X	X	X	-	X	X	X	-	X	X	X	-	100	X	X	X	X	-	X	-	-	A
Fluosilicic Acid (Hydro Fluosilic Acid)	H_2SiF_6	25	1.11	X	140	140	210	140	140	176	250	250	-	100	-	200	140	140	140	A	X	B	-	-	A
Formaldehyde	HCHO	-	-	140	150	150	140	X	70	-	121	250	150	150	-	X	140	140	X	-	-	A	-	-	-
Formaldehyde	HCHO	35	0.82	140	150	150	140	X	70	-	121	250	150	150	-	X	140	-	X	-	-	A	-	-	-
Formaldehyde	HCHO	50	-	140	100	73	140	X	-	-	73	250	-	-	-	X	140	80	X	A	-	A	-	-	-

				Plastics													Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ployvinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ployethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Formic Acid	HCOOH	25	-	100	120	100	210	X	140	X	212	300	X	100	-	100	200	100	X	-	-	A	-	-	-
Freon 11 (MF)	CCL_3F	-	1.22	72	72	73	250	-	-	-	121	250	-	-	-	180	X	200	180	-	-	A	A	-	-
Freon 113 (TF)	CL_3CCF_3	-	-	-	-	-	250	-	-	-	121	250	-	-	-	70	X	130	73	-	-	-	A	-	-
Freon 114	$C_2CL_2F_4$	-	-	-	-	-	250	-	-	-	121	250	-	-	-	100	X	130	100	-	-	-	A	-	-
Freon 12	CL_2CF_2	-	-	-	-	-	250	70	70	-	121	250	-	-	-	180	73	200	180	-	-	-	-	-	-
Freon 12 (Wet)	CL_2CF_2	-	-	-	-	-	-	-	-	-	-	250	-	-	-	-	-	-	-	-	-	-	-	-	-
Freon 22	$HCCIF_2$	-	-	X	X	73	150	-	-	-	121	X	-	-	-	X	X	130	X	-	-	A	A	-	A
Freon TF	-	-	-	-	-	-	-	-	-	60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fructose	-	-	-	140	190	180	250	140	140	176	-	400	220	200	-	180	75	160	180	-	-	A	-	-	-
Fruit Juice	-	-	-	140	190	180	250	140	140	-	121	400	-	-	-	210	-	200	180	-	-	A	-	-	-
Fruit Pulp	-	-	-	140	190	180	250	140	140	-	-	400	-	-	-	210	-	200	180	-	-	-	-	-	-
Fuel Oil	-	-	-	-	-	X	250	X	70	X	-	400	220	180	-	80	X	140	200	-	-	A	A	B	A
Furan	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	X	X	-	X	-	-	-	-	-	-
Furfural (Ant Oil) Bran Oil	-	-	0.94	X	X	X	80	X	X	X	121	400	X	X	-	X	-	200	X	-	-	A	-	-	-
Furfuryl Alcohol	-	-	1.2	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gallic Acid	-	-	-	140	190	73	100	X	140	-	121	400	-	-	-	190	70	70	70	-	-	A	-	-	-
Gas, Natural	CH_4	-	-	140	190	73	250	-	-	-	250	400	-	-	-	180	-	-	200	-	-	-	-	-	-
Gasoline, Leaded	-	-	-	100	-	X	250	X	70	X	250	400	230	150	-	180	X	80	180	-	-	A	-	-	-
Gasoline, Sour	-	-	-	140	150	X	250	X	70	X	250	400	230	150	-	180	X	80	200	-	-	A	-	-	-
Gasoline, Unleaded (1. Dry)	-	-	-	70	-	X	280	X	70	X	250	400	250	150	-	180	X	200	200	-	-	A	-	-	-
Gelatin	-	-	-	140	190	180	250	-	140	176	212	300	-	-	-	180	200	200	180	-	-	A	A	-	-
Gin	-	-	-	140	190	120	250	X	70	X	250	300	-	-	-	-	-	-	-	-	-	-	A	-	-
Gluconic Acid	-	50	-	-	-	-	-	-	-	-	-	-	180	100	-	-	-	-	-	-	-	-	-	-	-
Glucose	$C_6H_{12}O_6$	-	-	140	190	180	280	140	140	176	250	400	220	200	-	300	250	160	180	-	-	A	A	-	-
Glue	-	-	-	140	190	120	-	-	-	-	-	250	-	-	-	250	100	160	140	-	-	A	-	-	-
Glycerine (see Glycerol)	$C_3H_5(OH)_3$	-	-	140	190	180	280	X	140	176	250	400	300	200	-	250	200	200	180	-	-	A	A	-	A
Glycerol (Glycyl Alcohol)	$C_3H_5(OH)_3$	-	1.3	140	190	180	280	X	140	176	-	400	300	200	-	250	200	160	70	-	-	-	-	-	A
Glycolic Acid (see Hydroxyacetic Acid)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Glycols	-	-	-	140	190	120	250	X	140	-	250	300	250	200	-	250	200	160	140	-	-	A	-	-	-
Glyoxal	OHCCHO	30	1.26	-	-	-	-	-	-	-	-	120	-	-	-	-	-	70	X	-	-	A	-	-	-
Gold (Auric Cyanide)	$Au(CN)_4$	-	-	-	-	-	-	-	-	-	-	250	-	-	-	180	-	140	140	-	-	-	-	-	-
Grape Juice	-	-	-	140	140	-	250	-	140	-	-	250	-	-	-	210	140	160	180	-	-	A	-	-	-
Grape Sugar	-	-	-	140	140	140	250	140	140	-	-	250	-	-	-	210	140	160	180	-	-	A	-	-	-
Grease	-	-	-	-	-	-	-	70	140	-	-	-	-	-	-	200	X	100	150	-	-	A	-	-	-
Green Liquor (Alkaline pulp)	-	-	-	100	140	150	-	100	-	120	-	-	180	X	-	70	-	140	140	-	-	A	-	-	-
Helium	He	-	-	140	190	73	150	-	-	X	-	-	-	-	-	-	150	70	150	-	-	-	-	-	-
Heptane	$CH_3(CH_2)_5CH_3$	-	-	100	150	73	250	-	-	X	250	300	200	180	-	340	X	200	180	-	-	-	-	-	-
Hexane	$CH_3(CH_2)_4CH_3$	-	0.66	X	72	73	250	X	70	X	250	300	150	120	-	340	X	80	180	-	-	A	-	-	-
Hexene	-	-	0.67	X	X	X	-	-	-	-	-	300	-	-	-	-	X	X	70	-	-	A	-	-	-
Hexyl Alcohol (Hexanol)	$C_6H_{11}OH$	-	-	140	190	73	180	-	-	-	73	250	-	-	-	250	-	X	140	-	-	-	-	-	-
Honey	-	-	-	140	190	180	300	140	140	-	-	400	-	-	-	210	150	140	150	-	-	-	-	-	-
Hydraulic Oil	-	-	-	-	-	X	-	-	70	-	-	300	250	200	-	250	X	70	160	-	-	A	-	-	-
Hydraulic Oil (synthetic)	-	-	-	-	-	X	-	-	-	-	-	300	250	200	-	250	X	X	X	-	-	-	-	-	-
Hydrazine	H_2NNH_2	-	1	X	X	X	200	-	140	-	-	250	-	-	-	X	70	X	70	-	-	A	-	-	-
Hydrobromic Acid	HBr	48	1.5	140	180	180	250	140	140	-	-	250	100	120	-	190	140	X	X	-	-	A	-	-	-
Hydrobromic Acid	HBr	20	-	140	180	180	250	140	140	-	-	250	100	120	-	190	140	X	X	-	B	C	X	-	-
Hydrobromic Acid	HBr	10	-	140	180	180	250	140	140	-	-	400	100	120	-	190	140	X	X	-	-	C	-	-	-
Hydrochloric Acid	HCL	10	-	140	180	160	250	140	140	176	-	400	150	200	-	200	150	80	X	-	-	-	X	-	-
Hydrochloric Acid	HCL	20	-	140	180	160	250	140	140	176	-	400	120	200	-	200	100	80	180	-	-	X	-	-	-
Hydrochloric Acid	HCL	25	-	140	180	160	250	140	140	104	-	400	X	150	-	200	100	X	X	-	-	-	X	-	-
Hydrochloric Acid (Muriatic Acid)	HCL	37	1.19	140	180	160	210	140	140	68	212	400	X	150	-	200	100	X	X	A	C	X	X	-	-
Hydrocyanic Acid (Prussic Acid)	HCN	-	-	140	160	140	250	140	140	120	-	400	-	-	-	190	200	X	200	A	A	A	A	-	-
Hydrocyanic Acid	HF	5	-	140	140	140	250	140	140	-	-	400	-	-	-	190	200	X	200	-	-	A	-	-	-
Hydrofluoric Acid	HF	10	-	-	-	150	250	70	140	-	-	300	X	-	-	150	100	70	-	-	-	-	-	-	-

Chemical Resistance Guide

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ployvinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploye thylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Hydrofluoric Acid	HF	20	-	-	-	150	250	70	140	-	-	300	X	X	-	150	100	70	X	B	C	C	-	-	A
Hydrofluoric Acid	HF	30	-	-	-	120	250	70	140	-	212	300	X	-	-	200	100	X	X	-	-	C	-	-	A
Hydrofluoric Acid	HF	40	-	-	-	120	250	70	140	-	212	300	X	X	-	200	70	X	X	-	-	C	-	-	A
Hydrofluoric Acid	HF	50	-	X	X	100	250	70	140	-	212	300	X	X	-	200	X	X	X	-	-	C	-	-	A
Hydrofluosilicic Acid	H_2SiF_6	-	-	X	140	140	210	140	140	176	250	300	-	100	-	200	140	X	170	-	-	X	-	-	-
Hydrofluosilicic Acid	H_3SiF_6	25	-	X	140	140	210	140	140	176	-	300	-	100	-	200	140	X	170	-	-	X	-	-	-
Hydrogen	H	-	-	140	X	180	280	140	140	176	250	300	-	-	-	200	250	200	180	-	-	A	-	-	-
Hydrogen Chloride Gas Dry	HCL	-	1.27	73	-	140	180	140	-	-	-	300	150	150	-	70	-	70	-	-	-	-	-	-	-
Hydrogen Cyanide	HCN	-	-	140	190	150	280	-	-	-	250	300	-	-	-	150	100	200	70	-	-	A	-	-	-
Hydrogen Fluoride	HF	-	-	X	X	73	200	-	-	-	-	250	-	-	-	180	X	X	X	-	-	X	-	-	-
Hydrogen Peroxide	H_2O_2	5	-	140	160	180	250	140	140	68	73	250	X	150	-	180	100	-	-	-	-	-	-	-	-
Hydrogen Peroxide	H_2O_2	10	-	140	160	73	250	140	140	68	-	250	X	150	-	180	100	X	X	A	A	C	-	-	-
Hydrogen Peroxide	H_2O_2	30	-	140	73	X	250	140	140	68	-	250	X	150	-	200	100	X	X	-	-	-	-	-	-
Hydrogen Peroxide	H_2O_2	50	-	100	X	X	250	-	-	-	121	250	X	-	-	200	X	X	X	-	-	-	-	-	-
Hydrogen Peroxide	H_2O_2	90	-	X	X	X	68	-	-	-	121	400	X	-	-	100	X	X	X	-	-	-	-	-	-
Hydrogen Peroxide	H_2O_2	-	-	X	X	X	68	-	-	-	-	400	-	-	-	100	X	X	X	-	-	-	-	-	-
Hydrogen Phosphide (see Phosphine)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hydrogen Sulfide	H_2S	-	-	140	190	150	280	140	140	-	-	400	250	180	-	180	100	X	100	-	-	-	A	-	B
Hydrogen Sulfide (Aq Sol)	H_2S	-	1.19	140	180	150	200	140	140	-	121	400	250	180	-	140	100	X	100	A	A	A	A	-	B
Hydrogen Sulfide (dry)	H_2S	-	-	140	180	150	80	140	140	-	250	400	250	180	-	180	100	X	100	-	A	A	A	-	B
Hydroquinone	$C_6H_4(OH)_2$	-	-	140	190	150	250	140	140	X	212	400	-	-	-	180	X	X	70	-	-	-	-	-	-
Hydroxyacetic Acid (Glycolic Acid)	-	-	1.27	140	190	150	100	-	-	-	-	400	-	-	-	X	-	X	70	-	-	-	-	-	-
Hydroxyacetic Acid	$CH_2OHCOOH$	1	-	140	190	150	100	-	-	-	-	400	-	-	-	X	-	X	70	-	-	-	-	-	-
Hydroxylamine Sulfate	-	-	-	140	190	120	150	-	-	-	-	-	-	-	-	-	70	70	-	-	-	-	-	-	-
Hypochlorous Acid	$(NH_2OH)_2H_2SO_4$	-	10	140	180	120	250	140	140	-	250	400	-	-	-	180	70	X	X	-	-	X	X	B	B
Ink	-	-	-	-	-	-	-	X	140	-	-	-	-	-	-	70	70	70	70	-	-	A	-	-	-
Iodine Solution	I_2	0	-	X	X	X	150	X	X	X	212	400	120	100	-	180	70	X	70	-	-	C	-	-	-
Isobutyl Alcohol (see Alcohol, Isobutyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isoctane	-	-	0.7	72	72	73	250	-	-	X	73	-	-	-	-	190	X	70	70	-	-	A	-	-	-
Isophorone	-	0.92	X	X	-	180	-	-	X	X	-	-	-	-	-	X	X	-	-	-	-	-	-	-	-
Isopropanol-see Alcohol,Isopropyl	-	-	-	140	140	140	250	X	140	X	250	300	180	100	-	140	140	70	70	-	-	A	-	-	-
Isopropyl Acetate	$(CH_3)_2CHOH$	-	0.92	X	-	-	-	-	-	X	-	200	-	-	-	X	70	X	X	-	-	B	-	-	-
Isopropyl Alcohol (see Alcohol, Isopropyl)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isopropyl Chloride (see Chlorpropene)	$(CH_3)_2CHOH$	-	-	-	-	-	100	-	-	X	-	210	-	-	-	70	X	X	X	X	-	-	-	-	-
Isopropyl Ether	$CH_2CHCLCH_3$	-	0.72	X	X	X	130	-	-	X	73	140	-	-	-	X	X	X	70	-	-	A	-	-	-
Jet Fuel JP-3	-	-	-	-	-	-	-	-	-	X	-	200	250	180	-	190	X	X	70	-	-	A	-	-	-
Jet Fuel JP-4	-	-	-	140	72	X	250	-	-	X	250	400	250	180	-	300	X	X	200	-	-	A	-	-	-
Jet Fuel JP-5	-	-	-	140	72	X	250	-	-	X	250	400	250	180	-	300	X	X	200	-	-	A	-	-	-
Kerosene	-	-	0.81	140	72	X	250	X	70	X	250	400	250	180	-	300	X	X	200	-	-	A	-	-	-
Ketones	-	-	-	X	X	100	100	X	X	X	-	350	-	X	-	X	X	X	X	-	-	A	-	-	-
Kraft Liquor	-	-	-	140	190	73	70	140	-	100	-	400	-	-	-	100	-	70	70	-	-	A	-	-	-
Lacquer	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	-	-	A	-	-	-
Lacquer Thinner	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-	-	A	-	-	-
Lactic Acid (Milk Acid)	-	-	1.2	100	120	180	140	X	140	68	-	400	230	200	-	210	70	70	X	-	-	A	-	-	-
Lard	-	-	-	140	190	73	250	-	140	-	-	250	-	-	-	190	X	70	140	-	-	A	-	-	-
Lard Oil	-	-	-	140	190	73	48	-	140	-	250	250	-	-	-	190	X	70	140	-	-	A	-	-	-
Latex	-	-	-	-	-	-	-	-	-	-	-	-	220	200	-	70	70	100	70	-	-	-	-	-	-
Lauric Acid	$CH_3(CH_2)_{10}COOH$	-	0.83	140	190	150	230	140	-	140	212	400	220	200	1	100	-	-	70	-	-	-	-	-	-
Lauryl Chloride	$C_{12}H_{25}CL$	-	-	140	72	X	250	X	-	120	212	400	-	-	-	200	140	-	70	-	-	-	-	-	-
Lead Acetate (Sugar of Lead)	$Pb(C_2H_3O_2)_2$	-	-	140	190	180	250	140	140	176	250	400	250	200	-	X	210	160	70	-	-	B	B	A	B
Lead Chloride	$PbCL_2$	-	5.88	140	140	140	250	-	-	176	250	400	-	-	-	210	140	70	100	-	-	-	-	-	-

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ployvinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploye thylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Lead Nitrate	$Pb(NO_2)_2$	-	4.53	140	180	180	210		-	176	250	400	220	200	-	210	180	-	-	-	-	-	-	-	-
Lead Sulfate	$PbSO_4$	-	6.39	140	190	150	100	150	-	176	250	400	-	-	-	80	210	140	200	-	-	-	B	-	B
Lemon Oil	-	-	-	72	72	X	250	-	-	-	212	400	-	-	-	200	-	100	140	A	-	-	-	-	-
Levulinic Acid	-	-	-	-	-	-	-	-	-	-	-	-	220	200	-	-	-	-	-	-	-	-	-	-	-
Ligroin (Benzene)	-	-	-	X	X	X	200	-	-	X	-	250	-	-	-	100	X	70	100	-	-	A	-	-	-
Lime (Calcium Oxide)	CaO	-	-	-	-	-	-	-	-	176	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lime-Sulfur Solution	-	-	-	140	190	10	150	-	-	-	121	-	-	-	-	190	210	100	X	-	-	-	-	-	-
Linoleic Acid (Linolic Acid)	-	-	0.91	140	190	73	250	X	-	-	212	400	-	-	-	70	X	X	70	-	-	-	-	-	-
Linseed Oil (Flaxseed Oil)	-	-	-	140	190	150	250	X	70	X	212	400	250	100	-	250	70	70	180	-	-	-	-	-	-
Lithium Bromide	LiBr	-	3.46	140	190	-	230	-	-	-	121	400	-	-	-	200	-	200	140	-	-	-	-	-	-
Lithium Chloride	LiCL	-	-	140	190	-	250	-	-	-	-	400	230	200	-	140	100	-	70	-	-	A	-	-	-
Lubricants	-	-	-	-	-	-	-	-	-	-	250	-	-	-	-	-	-	-	-	A	A	A	-	-	-
Lubricating Oil	-	-	-	140	190	73	250	X	X	-	250	350	250	200	-	180	X	70	180	A	A	-	-	-	-
Lye Solution (see Sodium Hydroxide & Potassium Hydroxide)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Machine Oil	-	-	-	140	190	120	210	X	-	-	-	400	-	-	-	140	-	-	140	-	-	A	-	-	-
Magnesium Acetate	$(MgOOCCH_3)_2$	-	1.42	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium Carbonate	$MgCO_3$	-	3	140	180	180	210	140	140	176	250	400	220	200	-	210	170	140	180	-	-	A	-	-	-
Magnesium Chloride	$MgCL_2$	-	2.3	140	190	180	280	140	140	176	250	400	270	200	-	180	180	170	180	-	-	-	-	-	-
Magnesium Citrate	$MgHC_6H_50_7$	-	-	140	180	180	250	140	140	-	-	400	-	-	-	210	180	-	180	-	-	-	-	-	-
Magnesium Hydroxide (Milk of Magnesia)	$Mg(OH)_2$	-	2.36	140	190	180	250	140	-	176	250	400	270	150	-	230	170	160	180	A	A	A	A	-	A
Magnesiun Nitrate	$Mg(NO_3)_2$	-	2.03	140	190	180	250	140	140	176	250	400	250	200	-	230	140	160	70	-	A	A	-	-	-
Magnesium Oxide	MgO	-	3.6	-	-	-	-	-	-	176	-	-	-	-	-	-	140	160	140	-	A	-	-	-	-
Magnesium Sulfate (Epsom Salts)	$MgSO_4$	-	2.6	140	190	180	250	140	140	176	250	400	270	200	-	200	180	160	180	A	A	A	-	-	-
Maleic Acid	-	-	1.59	140	190	180	250	70	70	-	212	400	220	200	-	200	70	X	X	A	A	-	-	-	-
Maleic Anhydride	-	-	0.93	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	A	A	-	-	-	-
Malic Acid (Apple Acid)	-	-	1.6	140	190	73	250	-	-	-	212	400	-	-	-	200	X	70	100	-	A	B	B	-	B
Manganese Sulfate	$MnSO_4$	-	2.11	140	180	180	250	-	-	-	212	400	-	-	-	230	180	160	140	-	-	-	-	-	-
Mayonnaise	-	-	-	-	-	-	-	-	-	-	-	400	-	-	-	-	-	-	180	-	-	A	-	-	-
Mercuric Chloride	$HgCL_2$	-	5.4	140	190	180	250	140	-	X	212	400	220	200	-	190	210	140	140	-	-	X	-	-	-
Mercuric Cyanide	$Hg(CN)_2$	-	4	140	180	180	250	140	-	X	212	400	-	-	-	70	70	70	140	-	-	A	-	-	-
Mercuric Nitrate	$Hg(NO_2)_2$	-	4.3	140	180	180	250	140	-	-	-	-	-	-	-	70	-	70	-	-	-	-	-	-	-
Mercuric Sulfate	$HgSO_4$	-	6.47	140	180	180	230	-	-	-	212	300	-	-	-	70	70	-	70	-	-	-	-	-	-
Mercurous Chloride	Hg_2CL_2	-	6.99	-	-	-	-	-	-	-	212	400	220	200	-	200	100	140	100	-	-	-	-	-	-
Mercurous Nitrate	$HgNO_3$	-	4.79	140	190	120	250	-	-	-	212	400	-	-	-	200	100	140	100	-	-	-	B	-	C
Mercury (Quicksilver)	Hg	-	13.6	140	190	150	250	140	140	68	250	400	270	200	-	200	70	100	100	-	-	A	A	A	A
Methacrylic Acid Glacial	-	-	1.02	X	X	-	-	-	-	X	-	-	X	X	-	-	-	-	-	-	-	-	-	-	-
Methane (Methyl Hydride)	CH_4	-	-	140	72	120	280	-	-	-	212	400	250	200	-	300	X	200	180	-	-	A	-	-	-
Methanol (see Alcohol, Methyl)	-	-	0.8	140	210	180	250	X	140	X	250	400	150	-	-	X	100	140	140	-	-	A	A	-	-
Methoxyethyl Oleate	-	-	0.9	-	-	-	-	-	-	X	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl "Cellosolve"	-	-	-	X	X	73	250	-	-	X	212	400	-	-	-	X	70	70	X	-	-	A	-	-	-
Methyl Acetate	$CH_3CO_2CH_3$	-	0.92	X	X	68	100	-	-	X	-	-	-	-	-	X	-	X	X	-	-	A	-	-	-
Methyl Acetone	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	X	-	X	X	-	-	A	-	-	-
Methyl Acrylate	-	-	-	-	-	-	100	-	-	X	-	300	-	-	-	X	70	X	X	-	-	A	-	-	-
Methyl Alcohol	CH_3OH	-	-	140	210	180	250	X	140	X	250	400	150	-	-	100	100	140	140	A	A	A	-	-	-
Methyl Benzene (see Toluene)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Bromide	CH_3Br	-	1.73	X	X	X	250	X	X	X	250	350	-	-	-	180	X	X	X	-	-	-	-	-	-
Methyl Butanol (see Alcohol, Amyl)	-	-	0.82	X	72	73	250	X	140	-	-	400	200	100	-	190	210	140	140	A	A	A	-	-	-
Methyl Butyl Ketone	$CH_3COC_4H_9$	-	0.83	X	X	X	100	-	-	X	-	400	-	-	-	X	70	X	X	A	A	A	-	-	-
Methyl Chloride (Chloromethane)	CH_3CL	-	-	X	X	X	250	X	X	X	250	400	X	X	-	150	X	X	X	-	-	A	A	-	C
Methyl Chloroform (Trichloroethane)	-	-	-	X	X	X	120	-	-	X	11	-	X	X	-	80	X	X	X	-	-	A	-	-	-
Methyl Ether (see Dimethyl Ether)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone (MEK)	$CH_3COC_2H_5$	-	0.82	X	X	73	X	X	X	X	121	-	100	X	-	X	70	X	X	A	A	-	B	-	-

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ploywinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploye thylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Octanoic (Caprylic Acid)	$CH_3(CH_2)_6COOH$	-	0.91	-	-	-	250	-	-	X	-	400	-	-	-	-	-	-	X	-	A	-	-	-	-
Oils	-	-	-	140	190	120	250	140	-	140	-	400	-	200	-	-	-	-	100	-	-	-	-	-	-
Oils, Aniline	-	-	-	X	X	100	120	-	-	-	-	250	-	-	-	X	140	X	X	A	A	-	-	-	A
Oils, Anise	-	-	-	-	-	-	-	-	-	-	-	300	-	-	-	-	-	-	-	A	A	-	-	-	-
Oils, Bay	-	-	-	-	-	-	-	-	70	-	-	300	-	-	-	140	-	-	-	A	A	-	-	-	-
Oils, Bone	-	-	-	-	-	-	-	-	70	-	-	300	-	-	-	140	-	-	-	A	A	-	-	-	-
Oils, Castor	-	-	-	-	-	-	-	-	70	-	-	300	-	-	-	140	-	-	-	A	A	-	-	-	-
Oils, Cinnamon	-	-	-	-	-	-	-	-	70	-	-	300	-	-	-	X	-	-	-	A	A	-	-	-	-
Oils, Citric	-	-	-	-	-	72	-	-	70	-	-	300	-	-	-	140	-	-	-	A	A	-	-	-	-
Oils, Clove	-	-	-	-	-	72	-	-	70	-	-	300	-	-	-	-	-	-	140	A	A	-	-	-	-
Oils, Coconut	-	-	-	140	72	150	250	-	70	-	-	350	-	-	-	140	X	100	70	A	A	-	-	-	-
Oils, Cod Liver	-	-	-	-	-	72	-	-	70	-	-	300	-	-	-	140	108	100	140	A	A	-	-	-	-
Oils, Corn	-	-	-	68	68	100	-	250	70	X	-	250	-	-	-	140	X	X	140	A	A	-	-	-	-
Oils, Cotton Seed	-	-	-	140	-	150	-	250	70	X	-	300	-	-	-	140	X	X	180	A	A	-	-	-	-
Oils, Creosote	-	-	-	X	X	X	-	-	70	X	-	300	-	-	-	73	X	X	73	A	A	-	-	-	-
Oils, Crude Sour	-	-	-	140	-	73	-	250	70	-	-	250	250	200	-	180	X	-	70	A	A	-	-	-	-
Oils, Diesel Fuel	-	-	-	72	72	73	-	250	70	X	-	300	250	180	-	140	X	X	100	A	A	-	-	-	-
Oils, Fuel	-	-	-	140	-	73	250	70	X	-	-	300	250	180	-	140	X	X	100	A	A	-	-	-	-
Oils, Linseed	-	-	-	140	-	180	-	250	70	X	-	300	250	100	-	220	X	70	180	A	A	-	-	-	-
Oils, Mineral	-	-	-	140	-	100	-	250	70	-	-	300	270	200	-	300	X	70	140	A	A	-	-	-	-
Oils, Olive	-	-	-	140	-	180	-	250	70	X	-	300	220	200	-	150	-	140	140	A	A	-	-	-	-
Oils, Pine	-	-	-	140	-	-	-	-	70	X	-	300	150	150	-	70	-	-	70	A	A	-	-	-	-
Oils, Silicone	-	-	-	-	-	150	250	-	70	-	-	350	-	-	-	190	140	70	140	A	A	A	A	-	-
Oils, Vegetable	-	-	-	-	-	73	250	-	70	-	250	350	90	200	-	200	X	70	200	A	A	A	A	-	-
Oleic Acid (Red Oil)	-	-	0.9	140	190	73	250	-	-	-	212	250	200	200	-	190	70	70	100	-	-	A	A	A	-
Oleum (Fuming Sulfuric Acid)	H_2SO_4	100+	-	X	X	X	X	X	X	X	73	200	X	X	-	73	X	X	X	-	-	A	-	A	-
Oxalic Acid	-	-	1.7	73	73	150	150	140	-	110	121	400	270	200	-	180	150	100	X	-	-	A	A	A	-
Oxygen Gas	O_2	-	-	73	180	150	-	-	-	150	250	400	-	-	-	180	200	200	100	-	-	A	A	A	-
Ozonized Water	O_3	-	-	73	73	X	250	X	X	X	250	400	-	-	-	220	180	80	X	-	-	A	A	A	-
Palmitic Acid	-	10	0.84	140	72	180	240	70	70	-	212	400	220	200	-	190	70	X	100	-	-	A	-	-	-
Palmitic Acid	-	70	-	X	72	180	240	70	70	-	-	400	220	200	-	190	70	X	100	-	-	A	-	-	-
Paraffin	-	-	-	120	X	120	-	X	-	-	121	400	-	-	-	250	X	73	140	-	-	A	A	-	-
Pentane (Amyl Hydride)	$CH_3(CH_2)_3CH_3$	-	-	-	-	-	-	-	-	X	-	400	-	-	-	100	X	70	100	-	-	A	-	A	-
Peracetic Acid	CH_3COOOH	40	-	X	X	X	-	70	-	-	-	400	-	-	-	100	-	-	-	-	-	-	-	-	-
Perchloric Acid	$HCLO_4$	10	1.8	140	140	100	-	-	-	-	121	400	-	-	-	70	70	70	X	-	-	A	-	-	-
Perchloric Acid	$HCLO_4$	70	-	X	X	X	140	X	X	-	121	400	X	X	-	180	70	X	X	-	-	B	-	-	-
Perchloroethylene	CL_2CCCL_2	-	1.6	X	X	X	150	-	X	X	-	-	120	X	-	200	X	X	X	-	-	A	-	-	-
Petrolatum (Petroleum Jelly)	-	-	-	140	190	120	-	-	-	176	-	300	-	-	-	100	X	140	100	-	-	A	-	-	-
Petroleum (Sour)	-	-	-	100	150	73	250	X	70	-	121	300	250	200	-	180	X	X	180	-	-	-	-	-	-
Petroleum Oils	-	-	-	140	150	73	-	-	70	-	121	-	250	200	-	180	X	100	180	-	-	-	-	-	-
Phenols (Carbolic Acid)	C_6H_5OH	100	1.1	X	72	73	200	X	-	X	121	350	X	X	-	200	70	X	X	A	X	A	-	A	-
Phenyl Acetate	$C_6H_5OOCCH_3$	-	1.07	-	-	-	-	-	-	X	-	-	-	-	-	X	-	X	X	-	-	-	-	-	-
Phenylhydrazine	$C_6H_5NHNH_2$	-	1.1	X	X	X	100	X	X	X	73	400	-	-	-	180	X	X	X	-	-	-	-	-	-
Phosgene Gas	$COCL_2$	-	-	X	X	X	X	X	X	-	-	350	-	-	-	X	-	X	X	-	-	-	-	-	-
Phosgene Liquid	-	-	1.39	X	X	X	-	X	-	-	-	-	-	-	-	X	-	X	X	-	-	-	-	-	-
Phosphoric Acid	H_3PO_4	10	1.8	140	190	180	140	140	140	68	250	400	100	200	-	200	100	120	X	-	-	A	-	-	-
Phosphoric Acid	H_3PO_4	20	-	140	190	180	140	140	140	68	250	400	100	200	-	200	100	70	X	-	-	A	-	-	-
Phosphoric Acid	H_3PO_4	40	-	140	190	180	140	140	140	68	250	400	100	200	-	200	70	70	X	-	-	A	-	-	-
Phosphoric Acid	H_3PO_4	50	-	140	190	180	250	140	140	-	250	300	100	200	-	200	70	X	X	-	-	A	-	-	-
Phosphoric Acid	H_3PO_4	80	-	140	190	180	250	70	70	-	250	350	100	200	-	200	70	X	X	-	-	A	-	-	-
Phosphoric Acid	H_3PO_4	85	-	140	-	180	200	70	70	X	250	350	100	200	-	200	70	X	X	-	-	A	-	-	-
Phosphoric Acid	H_3PO_4	100	1.8	-	-	-	-	-	-	X	-	350	-	-	-	100	70	X	X	-	-	A	-	-	-
Phosphoric Acid Crude	H_3PO_4	-	1.83	-	-	-	-	-	-	-	-	250	-	-	-	100	70	X	X	-	-	-	-	-	-
Phosphorus Oxychloride	$POCL_3$	-	1.68	73	73	X	200	X	X	X	-	250	X	-	-	-	-	X	-	-	-	X	X	-	B
Phosphorus Red	-	-	-	70	68	68	250	-	-	-	-	350	-	X	-	-	-	-	-	-	-	A	-	-	-

Chemical Resistance Guide

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ploy vinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploy ethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hasteloy C	Titanium
Phosphorus Trichloride,dry	PCL_3	-	1.57	X	X	X	250	X	X	X	X	-	300			-	150	100	X	X	-	-	-	-	-
Phosphorus Yellow	-	-	-	68	68	68	250	-	-	-	-	350	-	-	-	-	-	-	-	-	-	-	-	-	-
Photographic Developer	-	-	-	140	190	150	250	X	140	-	-	350	-	-	-	190	-	100	-	A	A	-	-	-	-
Photographic Solutions	-	-	-	140	190	150	250	X	140	-	121	400	-	-	-	180	-	200	200	-	-	-	-	-	-
Phthalic Acid	-	-	-	-	-	-	-	-	-	-	-	400	-	-	-	-	-	-	-	-	-	-	-	-	-
(Terephthalic Acid)	$C_6H_4(COOH)_2$	-	1.59	X	X	X	200	-	-	-	-	-	-	-	-	140	100	X	X	-	-	A	A	-	B
Phthalic Anhydride	$C_6H_4(CO)_2O$	-	1.53	X	X	X	-	-	-	X	-	350	220	200	-	-	-	-	-	-	-	-	-	-	-
Pickle Brine	-	-	-	140	180	140	250	-	-	-	-	-	-	-	-	70	100	X	100	-	-	-	-	-	-
Pickling Solutions	-	-	-	140	180	180	250	X	140	-	-	400	-	-	-	-	X	X	X	-	-	-	-	-	-
Picric Acid	$C_6H_2(NO_2)_3OH$	-	1.77	X	X	73	70	X	100	-	73	400	100	100	-	190	140	200	X	-	-	A	-	-	A
Pine Oil	-	-	1.48	-	-	-	-	-	-	X	-	400	150	150	-	70	X	X	70	-	-	A	-	-	-
Plating Solutions, Antimony	-	-	-	140	190	250	240	140	140	-	-	300	-	-	-	140	-	100	100	-	-	A	-	-	-
Plating Solutions, Arsenic	-	-	-	140	190	150	240	140	140	-	-	300	-	-	-	100	-	100	100	-	-	A	-	-	-
Plating Solutions, Brass	-	-	-	140	180	180	240	140	140	-	121	300	-	-	-	150	70	200	180	-	X	B	-	-	-
Plating Solutions, Bronze	-	-	-	140	180	180	200	140	140	-	121	250	-	-	-	70	70	100	-	-	-	A	-	-	-
Plating Solutions, Cadmium	-	-	-	140	180	X	240	140	140	-	121	250	-	-	-	180	70	200	180	-	-	A	-	-	-
Plating Solutions, Chrome	-	-	-	140	180	X	250	140	140	-	121	250	-	-	-	250	-	100	X	-	-	A	-	-	-
Plating Solutions, Copper	-	-	-	140	180	180	210	140	140	-	121	250	-	-	-	180	70	80	180	-	-	-	-	-	-
Plating Solutions, Gold	-	-	-	100	180	X	250	140	140	-	121	250	-	-	-	180	70	80	180	-	-	-	-	-	-
Plating Solutions, Indium	-	-	-	140	180	120	200	140	140	-	-	350	-	-	-	100	-	130	-	-	-	-	-	-	-
Plating Solutions, Iron	-	-	-	140	180	140	200	140	140	-	-	400	-	-	-	-	-	X	180	-	-	-	-	-	-
Plating Solutions, Lead	-	-	-	140	180	140	250	140	140	-	121	350	-	-	-	180	70	100	180	-	-	-	-	-	-
Plating Solutions, Nickel	-	-	-	140	140	140	250	140	140	-	121	350	-	-	-	180	70	200	180	-	-	A	-	-	-
Plating Solutions, Rhodium	-	-	-	140	140	140	250	140	140	-	121	350	-	-	-	180	-	80	180	-	-	-	-	-	-
Plating Solutions, Silver	-	-	-	140	100	180	250	140	140	-	121	350	-	-	-	180	70	100	180	-	-	A	-	-	-
Plating Solutions, Tin	-	-	-	140	180	180	250	140	140	-	121	350	-	-	-	180	100	100	180	-	-	-	C	-	-
Plating Solutions, Zinc	-	-	-	140	180	180	250	140	140	-	121	350	-	-	-	180	70	200	180	-	-	-	-	-	-
Polyethylene Glycol	-	-	-	140	180	180	250	-	-	-	121	350	150	-	-	200	100	-	-	-	-	-	-	-	-
Polyvinyl Acetate Emulsion	-	-	1.19	-	-	-	250	-	-	68	-	350	150	100	-	68	-	200	68	-	-	-	-	-	-
Polyvinyl Alcohol	$(CH_2CHOH)_2$	-	-	140	140	180	250	-	-	-	-	400	150	100	-	140	-	-	100	-	-	-	-	-	-
Potash (Potassium Carbonate)	K_2CO_3	-	-	140	180	180	250	-	-	176	-	400	100	150	-	200	-	-	150	-	-	-	-	-	-
Potassium Acetate	$KC_2H_3O_2$	-	1.6	70	180	100	250	-	-	-	-	400	-	-	-	68	100	-	68	-	-	-	-	-	-
Potassium Alum (Aluminum Potassium Sulfate)	-	-	-	140	180	180	250	140	140	176	250	400	270	200	-	200	180	160	180	-	-	-	-	-	-
Potassium Bicarbonate	$KHCO_3$	-	2.2	140	200	180	250	-	-	176	-	400	100	150	-	200	170	160	70	A	A	A	-	-	-
Potassium Bichromate (see Potassium Dichromate)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium Bisulfate	$KHSO_4$	-	-	140	180	180	250	-	-	176	212	300	-	-	-	200	170	140	180	-	-	-	-	-	-
Potassium Bromate	$KBrO_3$	-	3.3	140	180	180	250	-	-	176	212	300	-	-	-	200	170	140	180	-	-	-	-	-	-
Potassium Bromide	KBr	30	2.7	140	180	180	250	-	-	176	250	300	220	200	-	200	150	160	180	-	-	-	-	-	-
Potassium Carbonate (Potash)	K_2CO_3	-	2.4	140	180	180	250	-	-	176	250	300	100	150	-	200	160	160	180	-	-	A	-	-	-
Potassium Chlorate Aqueous	$KCLO_3$	30	2.3	140	180	180	250	-	-	176	250	300	-	-	-	180	140	100	100	-	-	-	A	-	-
Potassium Chloride	KCl	-	2	140	180	180	250	-	-	176	250	350	200	200	-	200	200	140	180	-	-	-	-	-	-
Potassium Chromate	K_2CrO_4	-	2.7	140	180	180	250	-	-	-	250	-	-	-	-	100	170	70	140	A	X	-	-	-	-
Potassium Copper Cyanide	KCuCN	-	-	140	180	200	250	-	-	-	250	300	-	-	-	200	140	-	140	-	-	-	-	-	-
Potassium Cyanide	KCN	-	1.5	140	180	180	250	-	-	176	-	350	230	180	-	190	140	160	180	C	A	A	-	-	-
Potassium Dichromate	$K_2Cr_2O_7$	10	2.7	140	180	180	250	-	-	176	250	350	200	200	-	180	170	160	180	-	-	-	-	-	-
Potassium Ferricyanide	$K_3Fe(CN)_6$	-	-	140	180	140	250	-	-	176	250	350	220	200	-	140	140	150	70	-	-	-	-	-	-
Potassium Ferrocyanide	$K_4Fe(CN)_6$	-	1.9	140	180	140	250	-	-	176	250	350	220	200	-	180	140	200	180	-	-	-	-	-	-
Potassium Fluoride	KF	-	2.5	140	180	180	250	-	-	176	250	350	-	-	-	180	140	-	180	-	-	-	-	-	-
Potassium Hydroxide (Caustic Potash)	-	-	2	-	-	-	-	-	-	176	250	-	-	-	-	-	200	160	70	-	-	A	-	-	-
Potassium Hydroxide	KOH	25	-	140	180	180	140	-	-	176	-	350	100	120	-	-	200	160	100	-	-	A	-	-	-
Potassium Hydroxide	KOH	10	-	140	180	100	X	-	-	176	250	350	-	-	-	-	200	160	70	-	-	A	-	-	-
Potassium Hypochlorite	KHOCL	-	-	140	180	73	250	X	-	-	250	300	-	-	-	100	70	X	X	-	-	A	-	-	-

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ploy vinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploy ethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Potassium Iodide	KI	-	3.12	140	180	180	48	-	-	176	-	300	-	-	-	100	140	160	80	-	-	-	-	-	-
Potassium Nitrate (Salt Peter)	KNO_3	-	2.1	140	180	150	250	-	-	176	-	350	270	200	-	180	210	200	180	-	-	A	-	-	A
Potassium Perbotate	-	-	-	140	180	180	250	-	-	-	-	350	-	-	-	-	-	70	70	-	-	-	-	-	-
Potassium Perchlorate	$KCLO_4$	-	2.5	140	180	180	250	-	-	-	-	350	-	-	-	150	140	X	X	-	-	-	-	-	-
Potassium Permanganate	$KMNO_4$	20	2.7	140	*	120	250	-	-	-	73	350	X	150	-	150	210	100	X	A	A	B	B	-	B
Potassium Persulfate	$K_2S_2O_8$	-	2.5	140	180	120	250	-	-	-	300	400	-	180	-	200	210	140	X	A	A	-	A	-	-
Potassium Phosphate	K_2HPO_4	-	-	-	180	-	-	-	-	-	121	400	180	100	-	140	100	100	100	-	-	-	-	-	-
Potassium Sulfate	K_2SO_4	-	2.7	140	180	180	250	-	-	176	-	400	250	180	-	200	180	140	140	A	A	-	-	-	-
Potassium Sulfide	K_2S	-	1.8	100	120	-	250	-	-	-	250	300	-	-	-	100	-	70	100	-	-	-	-	-	-
Potassium Thiosulfate	$K_2S_2O_3$	-	-	-	-	-	-	-	-	176	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propane (Dimethyl- Methane)	C_3H_8	-	-	72	72	73	250	-	-	X	-	300	150	100	-	300	X	70	100	-	-	-	-	-	-
Propanol (see Alcohol, Propyl)	-	-	-	-	-	-	-	-	-	X	250	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Propargyl Alcohol	$HC:CCH_2OH$	-	-	72	72	120	150	-	-	-	-	350	-	-	-	140	-	X	X	-	-	-	-	-	-
Propyl Acetate	$C_3H_7OOCCH_3$	-	0.89	-	-	-	100	-	-	X	73	140	-	-	-	X	70	X	100	-	-	-	-	-	-
Propyl Alcohol	$CH_3CH_2CH_2OH$	-	0.8	120	160	150	150	-	-	X	250	400	-	-	-	200	140	200	-	-	-	-	-	-	-
Propylene	$CH_3CH:CH_2$	-	0.51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
Propylene Dichloride	$CH_3CHCLCH_2CL$	-	1.58	X	X	X	150	-	-	X	-	400	-	-	-	70	X	X	100	-	-	-	-	-	-
Propylene Glycol	$CH_2CHOHCH_2OH$	-	1	-	*	-	250	X	140	-	-	400	200	-	-	200	-	100	x	-	-	-	-	-	-
Pyridine	$N(CH)_4CH$	-	1	X	X	73	X	-	-	X	-	350	-	-	-	X	70	X	80	-	-	-	B	-	-
Pyrogallic Acid (Pyrogallol)	$C_6H_3(OH)_3$	-	1.47	73	-	-	150	-	-	-	121	350	-	-	-	80	-	200	-	-	-	-	-	-	-
Salts	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	-
Rayon Coagulating Bath	-	-	-	140	180	73	73	X	140	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
Rhodan Salts (Thiocyanates)	-	-	-	140	140	140	250	-	-	-	-	-	-	-	-	180	-	-	-	-	-	-	-	-	-
Rosins	-	-	-	-	-	-	-	-	-	-	-	350	-	-	-	-	-	-	-	-	-	-	-	-	-
Rum	-	-	-	100	100	100	-	-	-	-	-	-	-	-	-	70	-	-	-	-	-	-	-	-	-
Salad Dressings	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	-
Salicylaldehyde	C_6H_4OHCHO	-	1.17	X	X	-	140	-	-	-	73	200	-	-	-	-	-	-	-	-	-	-	-	-	-
Salicylic Acid	$C_6H_4(OH)(COOH)$	-	1.44	-	-	-	210	-	-	-	-	250	-	-	-	200	-	-	68	A	A	-	-	-	-
Saline Solutions (Brine)	-	-	-	140	190	180	250	140	140	-	250	400	200	-	-	280	250	160	180	-	-	B	-	-	-
Salt Brine	-	-	-	140	190	180	250	140	140	-	250	400	200	-	-	280	250	160	180	A	A	B	-	-	B
Sea Water	-	-	-	140	190	180	250	140	140	176	250	400	200	-	-	280	250	160	180	A	A	C	-	-	A
Salenic Acid	H_2SeO_4	-	22.6	140	190	73	70	70	70	-	-	350	-	-	-	-	-	-	-	-	-	-	-	-	A
Sewage	-	-	-	140	180	180	250	-	-	-	-	350	-	-	-	180	140	140	150	A	A	A	-	-	-
Shellac Orange	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Salicic Acid	SiO_2H_2O	-	-	140	180	180	250	140	140	-	-	250	-	-	-	200	140	140	180	-	-	-	-	-	-
Silicone Oil	-	-	-	140	150	150	250	-	-	-	73	350	-	-	-	190	140	70	140	A	A	A	-	-	-
Silver Bromide	AgBr	-	6.47	-	-	-	-	140	140	-	73	-	-	-	-	-	-	-	-	A	-	-	-	-	-
Silver Cyanide	AgCN	-	3.95	140	180	180	250	140	140	-	250	300	-	-	-	140	140	70	x	-	-	-	-	-	-
Silver Nitrate	$AgNO_3$	-	4.32	140	180	180	280	140	140	-	250	350	-	-	-	250	200	160	140	A	A	A	-	-	-
Silver Salts	-	-	-	140	180	180	280	140	140	-	-	350	-	-	-	140	140	100	-	-	-	A	-	-	-
Silver Sulfate	Ag_2SO_4	-	5.45	140	180	140	250	140	140	-	250	250	-	-	-	200	170	100	100	-	-	-	-	-	-
Soap Solutions	-	-	-	140	180	180	280	x	140	-	121	350	-	-	-	200	200	140	180	A	A	A	-	-	-
Soda Ash (Sodium Carbonate)	Na_2CO_3	-	1.55	140	180	180	280	-	-	176	250	400	100	150	-	250	140	140	140	-	-	A	-	-	-
Sodium Aceate	$NaC_2H_3O_2$	-	1.5	140	180	180	250	140	140	176	250	350	220	200	-	X	170	200	X	A	A	A	-	-	-
Sodium Alum	-	-	-	140	180	180	250	140	140	-	250	350	-	-	-	210	160	140	180	-	-	-	-	-	-
Sodium Aluminate	$Na_2AL_2O_4$	-	-	-	-	-	-	-	-	176	-	-	-	-	-	200	200	140	180	A	A	-	-	A	A
Sodium Benzoate	C_6H_5COONa	-	-	140	180	180	250	140	140	-	250	300	200	180	-	200	210	-	140	-	-	-	-	-	-
Sodium Bicarbonate	$NaHCO_3$	-	2.2	140	180	180	280	140	140	176	250	400	250	150	-	300	210	160	180	A	A	-	-	A	A
Sodium Bichromate (see SodiumDichromate)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium Bisulfate	$NaHSO_4$	-	2.4	140	180	180	280	140	149	176	250	250	250	200	-	250	200	140	180	A	A	-	-	A	-
Sodium Bisulfite	$NaHSO_3$	-	1.5	140	180	180	250	140	140	176	250	350	-	-	-	250	200	140	180	-	-	-	-	A	A
Sodium Borate (Borax)	NaB_4O_7	-	1.7	100	180	200	250	140	140	176	-	300	-	-	-	180	140	200	180	A	A	-	-	A	A
Sodium Bromate	$NaBrO_3$	-	3.34	-	-	-	-	140	140	176	-	-	140	-	-	-	-	-	-	-	-	-	-	-	-
Sodium Bromide	NaBr	-	3.2	140	180	180	250	-	-	176	250	300	250	200	-	250	210	70	70	-	-	-	-	A	-

Chemical Resistance Guide

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ploy vinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploy ethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Sodium Carbonate (Soda Ash)	Na_2CO_3	-	1.55	140	180	180	250	-	-	176	250	350	100	150	-	200	140	200	200	B	A	-	-	A	A
Sodium Chlorate	$NaClO_3$	-	2.5	100	180	180	250	-	-	176	250	350	-	180	-	180	140	70	180	A	A	-	-	A	-
Sodium Chloride (Salt)	NaCL	-	2.2	140	180	180	280	140	140	176	250	350	270	200	-	200	140	160	140	-	-	-	-	B	A
Sodium Chlorite	$NaClO_2$	25	-	140	180	73	140	-	-	-	212	400	-	-	-	X	X	-	X	-	-	-	-	-	-
Sodium Chromate	Na_2CrO_4	-	-	-	-	-	200	-	-	-	-	-	-	-	-	70	70	70	70	-	-	-	-	A	-
Sodium Cyanide	NaCN	-	-	140	170	180	250	-	-	176	250	350	230	200	-	200	140	140	140	-	-	-	-	A	-
Sodium Dichromate	$Na_2Cr_2O_7$	-	2.5	140	140	140	250	-	-	176	121	350	200	200	-	200	140	70	140	-	-	-	-	-	-
Sodium Ferricyanide	$Na_3Fe(CN)_6$	-	1.5	140	180	150	250	-	-	176	-	300	270	200	-	140	140	-	70	-	-	A	-	-	-
Sodium Ferrocyanide	$Na_4Fe(CN)_6$	-	1.5	140	180	150	250	-	-	176	-	350	270	200	-	140	140	-	70	-	-	-	-	-	-
Sodium Fluoride	NaF	-	2.6	140	180	180	250	-	-	716	250	350	-	-	-	140	140	70	70	-	-	A	-	-	-
Sodium Hydrosulfide	NaSH	-	-	-	-	-	-	-	-	-	250	-	120	-	-	-	-	-	-	-	-	-	-	-	-
Sodium Hydroxide	NaOH	15	-	140	180	180	150	X	140	176	250	400	120	100	-	100	210	160	140	-	-	A	-	-	-
Sodium Hydroxide	NaOH	20	-	140	180	180	73	X	140	176	-	350	120	100	-	100	210	160	100	-	-	A	-	-	-
Sodium Hydroxide	NaOH	30	-	140	180	180	X	X	140	176	212	350	120	100	-	100	210	160	100	-	-	A	-	-	-
Sodium Hydroxide	NaOH	50	2.1	140	180	180	X	X	140	176	212	350	150	X	-	X	180	160	X	-	-	A	-	-	-
Sodium Hydroxide	NaOH	70	-	140	180	180	X	X	140	176	-	350	-	-	-	X	70	100	X	-	-	-	-	-	-
Sodium Hydroxide Conc. (Caustic Soda)	NaOH	-	-	140	180	120	X	X	140	176	-	70	-	-	-	X	100	X	X	-	-	-	-	-	-
Sodium Hypochlorite (Bleach)	NaOCL	5/1/04	-	140	180	X	100	140	140	X	250	300	X	150	-	140	70	X	X	-	-	A	-	-	-
Sodium Hypochlorite Conc	NaOCL	15	-	140	100	X	100	-	-	X	-	300	X	-	-	180	X	70	X	-	-	-	-	-	-
Sodium Iodide	NaI	-	-	-	-	-	280	-	-	-	121	-	-	-	-	-	-	160	-	-	-	-	-	-	-
Sodium Metaphosphate	$(NaPO_3)n$	-	-	140	180	150	250	-	-	68	250	-	-	-	-	180	70	100	150	-	-	A	-	-	-
Sodium Metasilicate	$Na2SiO_3$	-	-	140	180	180	250	-	-	176	-	350	-	-	-	200	-	-	170	-	-	-	-	-	-
Sodium Nitrate	$NaNO_3$	-	2.3	140	180	180	250	-	-	-	-	400	270	200	-	210	200	190	170	A	A	A	-	-	-
Sodium Nitrate	$NaNO_3$	-	2.2	140	180	180	250	-	-	176	250	400	270	200	-	200	170	140	X	A	A	A	-	-	-
Sodium Palmitate	-	-	-	140	180	120	250	-	-	-	-	400	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium Perborate	$NaBO_3$	-	-	140	180	180	250	-	-	-	-	350	-	-	-	180	70	200	200	-	-	A	-	-	-
Sodium Perchlorate	$NaClO_4$	-	2.02	140	180	180	250	-	-	-	73	350	-	-	-	-	-	-	70	-	-	-	-	-	-
Sodium Peroxide	Na_2O_2	10	2.8	140	180	180	200	-	-	-	250	350	-	-	-	180	140	200	200	-	-	A	-	-	-
Sodium Phosphate Acid	Na_2HPO_4	-	1.7	140	180	140	280	-	-	-	250	350	-	-	-	200	170	140	140	-	-	A	-	-	-
Sodium Phosphate Alkaline (Mono Basic)	NaH_2PO_4	-	2.04	140	180	180	250	-	-	-	250	350	-	-	-	200	170	140	140	-	-	A	-	-	-
Sodium Phosphate Neutral (Tri Basic)	Na_3PO_4	-	1.62	140	180	180	250	120	-	-	250	350	-	-	-	200	170	140	140	-	-	-	-	-	-
Sodium Polyphosphate	-	-	-	140	180	180	250	120	-	-	-	350	-	-	-	200	150	140	140	A	A	A	-	-	-
Sodium Silicate (Water Glass)	Na_2OSiO_2	-	-	140	180	180	250	-	-	176	250	350	220	200	-	200	200	140	140	A	A	A	-	-	-
Sodium Sulfate	Na_2SO_4	-	2.7	140	180	150	280	140	140	176	250	400	270	200	-	200	140	140	140	A	A	A	-	-	-
Sodium Sulfide	Na_2S	50	1.4	140	180	180	250	140	140	-	250	350	-	150	-	200	140	140	140	A	A	A	-	-	-
Sodium Sulfite	Na_2SO_3	-	2.6	140	180	180	250	140	140	176	250	350	200	200	-	200	140	140	140	A	A	A	A	-	B
Sodium Tetraborate	$Na_2B_4O_7$	-	-	140	180	120	250	140	140	176	-	300	-	-	-	140	100	100	70	A	A	A	-	-	-
Sodium Thiocyanate	NaSCN	-	-	140	140	140	240	140	140	-	-	250	200	180	-	180	140	-	100	A	A	-	-	-	-
Sodium Thiosulfate (HypO)	$Na_2S_2O_3$	-	1.7	140	180	180	250	140	140	176	250	350	150	200	-	200	-	200	160	A	A	-	B	-	-
Soybean Oil	-	-	-	140	180	180	250	X	70	-	-	250	-	-	-	200	X	70	140	A	A	A	-	-	-
Stannic Chloride (Tin Chloride)	$NaSnCL_6$	-	2.3	140	180	150	280	-	-	-	250	350	250	200	-	200	100	X	140	A	A	C	X	-	-
Stannic Salts	-	-	-	140	180	150	280	-	-	-	-	350	250	200	-	200	100	X	140	-	-	C	X	-	-
Stannous Chloride (Tin Salts)	$SnCL_2$	-	-	140	180	180	250	-	-	-	250	350	220	200	-	200	100	X	140	-	-	C	A	-	-
Starch (Amylum)	-	-	1.51	140	180	180	250	140	140	176	121	350	-	-	-	200	140	140	170	A	A	A	-	-	-
Stearic Acid	-	-	0.84	140	180	120	250	-	-	176	121	350	220	200	-	80	X	70	200	-	-	A	A	-	-
Stoddard Solvent (Dry Cleaning Solvent)	-	-	-	X	X	70	250	-	-	X	250	300	-	-	-	180	X	X	180	A	A	A	B	-	-
Strontium Carbonate	$SrCO_3$	-	3.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	$C_6H_5CH:CH_2$	-	0.9	X	X	X	200	-	-	X	-	250	100	180	-	X	X	X	X	-	-	A	-	-	-
Succinic Acid (Butanedioic Acid)	-	-	1.55	140	170	150	150	-	-	-	212	200	-	-	-	70	70	-	70	-	-	A	-	-	-
Sugar Solutions	-	-	-	140	200	180	270	-	-	-	-	350	220	180	-	200	140	140	100	-	-	-	-	-	-
Sulfamic Acid	HSO_3NH_2	25	2.1	-	180	X	X	-	-	176	-	-	100	180	-	-	-	-	-	-	-	-	-	-	-

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ployvinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploye thylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hasteloy C	Titanium
Sulfate Liquors (Paper Pulp)	-	-	-	140	190	150	150	-	-	-	73	200	-	-	-	80	70	140	80	-	-	A	-	-	-
Sulfonated Detergents	-	-	-	140	190	150	200	-	-	-	-	300	-	-	-	100	-	-	-	-	-	-	-	-	-
Sulfur	S	0	-	-	73	-	248	70	70	68	212	350	-	-	-	73	X	80	X	-	-	A	A	-	A
Sulfur Dioxide	SO_2	-	-	-	-	-	-	-	-	X	-	-	180	200	-	-	-	-	-	-	-	-	-	-	-
Sulfite Liquor (Sulfite Paper Process)	-	-	-	140	180	180	250	-	-	-	73	-	150	200	-	140	140	70	70	-	-	A	-	-	-
Sulfur Chloride	S_2CL_2	-	1.69	140	-	X	250	-	-	-	73	-	X	X	-	180	X	X	X	-	-	C	-	-	-
Sulfur Dioxide Dry	SO_2	-	-	140	180	180	250	70	70	X	212	300	X	200	-	100	70	X	X	-	-	A	-	-	-
Sulfur Dioxide Wet	SO_2	-	-	100	150	180	250	70	70	X	121	300	-	-	-	140	140	X	X	-	-	A	-	-	-
Sulfur Slurries	-	-	-	140	180	X	250	-	-	-	-	350	-	-	-	200	X	70	X	-	-	A	-	-	-
Sulfur Trioxide Dry	$S0_3$	-	-	X	X	X	X	-	-	-	-	-	X	X	-	150	X	X	X	-	-	B	-	-	-
Sulfuric Acid	H_2SO_4	10	-	140	180	180	250	140	140	176	212	350	100	200	-	200	140	100	100	A	A	X	X	X	A
Sulfuric Acid	H_2SO_4	30	-	140	180	150	250	140	140	176	212	350	100	180	-	200	140	100	100	-	-	X	X	X	A
Sulfuric Acid	H_2SO_4	50	-	140	180	150	200	140	140	68	212	350	100	180	-	200	140	100	100	-	-	X	X	X	A
Sulfuric Acid	H_2SO_4	60	-	140	180	140	200	X	70	X	212	350	*	120	-	200	140	100	X	-	-	X	X	X	A
Sulfuric Acid	H_2SO_4	70	-	140	180	140	200	X	70	X	212	350	X	X	-	200	140	X	X	-	-	X	X	X	B
Sulfuric Acid	H_2SO_4	80	-	140	180	X	200	X	70	X	212	350	X	X	-	200	70	X	X	-	-	X	C	X	B
Sulfuric Acid	H_2SO_4	90	-	73	150	X	200	X	70	X	212	350	X	X	-	200	X	X	X	-	-	X	C	X	B
Sulfuric Acid	H_2SO_4	95	-	X	150	X	180	X	70	X	212	350	X	X	-	200	X	X	X	-	-	C	B	X	B
Sulfuric Acid	H_2SO_4	98	1.84	X	100	X	140	X	X	X	212	350	X	X	-	200	X	X	X	-	-	C	B	X	B
Sulfuric Acid	H_2SO_4	100	-	X	X	X	X	X	X	X	-	-	X	X	-	100	X	X	X	-	-	C	B	X	B
Sulfurous Acid	H_2SO_4	-	1.03	140	170	170	250	140	-	-	212	350	-	-	-	180	X	X	X	-	-	A	B	-	B
Sulfuryl Chloride	SO_2CL_2	-	1.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	B
Tall Oil	-	-	-	140	180	180	250	X	70	-	250	250	200	200	-	300	X	70	200	-	-	A	B	-	-
Tallow (Animal Fat)	-	-	0.86	-	-	-	-	X	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tannic Acid	$C_{76}H_{52}O_{46}$	-	-	140	200	180	250	X	140	-	212	250	225	200	-	100	70	100	100	-	-	A	B	-	-
Tanning Liquors	-	-	-	140	190	73	68	-	-	-	212	250	-	-	-	200	-	70	180	A	A	A	B	-	-
Tar	-	-	-	X	X	-	250	-	-	-	250	250	-	-	-	190	X	70	X	-	-	A	-	-	-
Tartaric Acid (DihydroxySuccinic Acid)	-	-	1.8	140	180	140	250	140	140	176	212	250	250	200	-	180	X	180	70	-	-	A	-	-	-
Tertiary Butyl Alcohol	-	-	-	68	68	68	250	-	-	X	-	250	-	-	-	70	-	-	X	-	-	A	-	-	-
Tetrachlorethane	$CHCL_2CHCL_2$	-	-	X	X	X	250	-	-	X	-	350	-	-	-	70	X	X	X	-	-	A	-	-	-
Tetraethyl Lead	$Pb(C_2H_5)_4$	-	1.65	72	72	73	250	-	-	-	250	350	-	-	150	X	X	X	-	-	-	-	-	-	-
Tetrahydrofuran	-	-	-	X	X	X	X	X	X	X	X	350	120	100	-	X	X	X	X	-	-	-	X	-	-
Tetralin (Tetrahydro-Naphthalene)	$C_{10}H_{12}$	-	-	X	X	X	-	X	X	X	-	300	-	-	-	68	X	X	X	-	-	-	-	-	-
Thionyl Chloride	$SOCL_2$	-	1.64	X	X	X	X	X	X	X	121	350	X	X	-	73	X	X	X	-	-	X	X	-	-
Thread Cutting Oils	-	-	-	140	72	120	150	-	-	-	250	400	-	-	-	70	X	-	70	-	-	B	B	-	-
Titanium Tetrachloride	$TiCL_4$	-	-	X	X	X	X	-	-	-	-	400	-	-	-	150	X	X	X	-	-	C	C	A	C
Titanous Sulfate	$Ti_2(SO_4)_3$	-	1.47	140	180	180	250	-	-	-	-	350	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	$CH_3C_6H_5$	-	0.9	X	X	X	-	X	X	X	121	350	150	X	-	70	X	X	-	A	A	A	A	A	A
Tomato Juice	-	-	-	140	180	150	250	70	140	68	-	400	-	-	-	200	200	100	150	-	-	C	B	-	B
Mineral Oil Type	-	-	-	140	190	73	200	X	70	176	212	400	150	X	-	180	X	100	180	-	-	A	-	-	-
Tributyl Phosphate	$(C_4H_9)_3PO_4$	-	-	X	X	70	100	-	-	X	73	400	-	-	-	X	70	X	X	A	A	-	-	A	-
Trichloroacetic Acid	$XCCL_3COOH$	-	1.6	73	72	120	100	-	-	-	121	400	-	-	-	180	70	70	70	-	-	X	X	B	-
Trichloroethane (Methyl Chloroform)	$CHCL_2CH_2CL$	-	-	X	X	X	-	-	-	X	-	350	-	-	-	-	X	X	X	-	-	-	-	A	-
Trichloroethylene	$CHCL:CCL_2$	-	1.1	X	X	68	170	X	X	X	73	350	120	X	-	200	X	X	X	-	-	-	-	A	-
Trichloropropane	-	-	1.39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-
Tricresyl Phosphate (TCP)	$(CH_3C_6H_4O)_3PO$	-	1.16	X	X	-	-	-	-	X	212	-	-	-	-	-	-	X	X	-	-	-	-	A	-
Triethanolamine	$(HOCH_2CH_2)_3N$	-	1.12	X	X	X	X	-	-	73	73	-	150	X	-	X	70	70	70	-	-	C	C	A	-
Triethyl Phosphate	$(C_2H_5)_3PO_4$	-	0.73	-	-	-	-	-	-	X	73	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Triethylamine	$(C_2H_5)_3N$	-	-	73	72	72	70	-	-	-	121	-	100	X	-	200	73	70	140	-	-	-	-	-	-
Trimethylpropane	$(CH_2OH)_3C_3H_5$	-	-	73	-	-	250	-	-	-	-	300	-	-	-	200	-	150	150	-	-	-	-	-	-
Trisodium Phosphate	Na_3PO_4	-	-	140	180	180	250	-	-	-	250	300	-	-	-	180	70	200	200	-	-	A	-	-	-
Turbine Oil	-	-	-	72	72	70	-	-	-	-	-	350	-	-	-	140	X	X	68	A	A	A	-	-	-

CHEMICAL RESISTANCE GUIDE

				Plastics												Elastomers				Seals		Metals			
Chemicals	Formula	% Concentration	Approximate sp Gravity @ 100% Concentration	PVC	CPVC	Polypropylene (PP)	Ploy vinylidene Fluoride (PVDF)	HD Linear Polyethylene (PE)	Ploy ethylene-Cross Linked (XLPE)	DURAPLUS ABS	Halar	PTFE	Epoxy	Vinylester	Polysulfone	Viton	EPDM	Neoprene	Buna-N (Nitrile)	Carbon	Ceramic	304 Stainless Steel	316 Stainless Steel	Hastelloy C	Titanium
Turpentine	$C_{10}H_{16}$	-	0.9	X	X	X	250	X	X	X	250	300	150	X	-	180	X	X	100	-	-	A	A	-	B
Urea	$CO(NH_2)_2$	-	1.3	140	180	180	250	X	140	176	212	250	200	150	-	180	140	140	140	-	-	-	-	-	-
Urine	-	-	-	140	180	180	250	140	140	68	121	350	-	-	-	180	140	140	100	-	-	A	-	-	-
Vanilla Extract (Vanillin)	-	-	-	-	-	-	-	X	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Varnish	-	-	-	-	-	-	250	-	-	68	-	250	-	-	-	68	X	X	68	-	-	A	-	-	-
Vaseline	-	-	-	140	180	180	250	-	-	176	121	400	-	-	-	70	X	140	140	-	-	-	-	-	-
Vegetable Oil	-	-	-	140	150	140	200	-	70	-	-	400	-	-	-	300	140	200	100	-	-	A	A	-	B
Vinegar (4-8% Acetic Acid)	-	-	-	140	180	140	200	140	140	68	212	400	200	200	-	180	140	200	X	-	-	A	B	-	C
Vinyl Acetate	-	-	0.93	X	X	-	250	-	-	X	73	350	150	X	-	X	70	X	X	-	-	A	A	-	-
Vinyl Chloride	CH_2:CHCL	-	-	X	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Ether	CH_2:CHOCH:CH_2	-	0.77	X	X	X	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Water Acid Mine	-	-	-	140	180	150	280	-	-	-	250	400	-	-	-	180	250	160	180	A	A	A	A	-	A
Water Deionized	N_20	-	-	140	180	180	280	140	140	176	250	400	250	180	-	140	250	160	180	A	A	A	-	-	A
Water Demineralized	N_20	-	-	140	180	180	280	140	140	176	250	400	250	200	-	180	250	160	200	A	A	A	-	-	A
Water Distilled	N_20	-	-	140	180	180	280	140	140	176	250	400	250	200	-	140	250	160	180	A	A	A	-	-	A
Water Potable	N_20	-	-	140	180	180	280	140	140	176	250	400	270	200	-	140	250	160	180	A	A	A	-	-	A
Water Salt	N_20	-	-	140	180	180	280	140	140	-	250	400	270	200	-	180	250	160	180	A	A	B	-	-	A
Water Sewage	N_20	-	-	140	180	180	280	140	140	-	250	400	250	200	-	180	250	160	180	A	A	A	-	-	A
Whey	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	-
Whiskey	-	-	0.9	140	180	180	250	X	140	X	250	350	-	-	-	180	200	200	180	A	A	A	-	-	-
White Acid	NH_4HF_2HF	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A	A	-	-	-	-
White Liquor	-	-	-	140	180	180	250	-	-	-	212	350	100	150	-	180	-	140	140	A	A	B	B	-	-
Wines	-	-	-	140	180	140	250	140	140	-	212	300	-	-	-	180	170	200	180	A	A	A	A	-	-
Xylene	$C_6H_4(CH_3)_2$	-	0.9	X	X	X	250	X	X	X	-	350	150	X	-	180	X	X	X	A	A	-	-	-	-
Zinc Acetate	$Zn(C_2H_3O_2)_2$	-	0.17	140	180	180	250	140	140	-	-	350	180	-	-	70	180	160	-	-	-	-	-	-	-
Zinc Carbonate	$ZnCO_3$	-	4.45	-	-	-	-	140	140	176	-	-	-	-	-	-	-	-	100	A	A	-	-	-	-
Zinc Chloride	$ZnCL_2$	-	2.9	140	190	180	250	140	140	X	250	350	250	200	-	200	180	160	70	A	A	-	-	-	-
Zinc Chromate	$ZnCrO_4$	-	3.4	-	-	-	-	140	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc Nitrate	$Zn(NO_3)_2$	-	20.6	140	190	180	250	140	140	176	250	350	-	-	-	200	180	100	140	-	-	-	-	-	-
Zinc Phosphate	$Zn_3(PO_4)_2$	-	4	-	-	-	-	140	140	176	-	-	180	200	-	-	-	-	-	-	-	-	-	-	-
Zinc Salts	-	-	-	140	190	180	250	140	140	-	-	350	-	-	-	200	180	-	140	-	-	-	-	-	-
Zinc Sulfate	$ZnSO_4$	-	2	140	190	180	50	140	140	176	250	400	250	200	-	200	180	140	140	A	A	-	-	-	-