Chemical Resistance Guide For Pipe, Valves & Fittings

This chemical resistance guide has been compiled to assist the piping system designer in selecting chemical resistant materials. The information given is intended as a guide only. Many conditions can affect the material choices. Careful consideration must be given to temperature, pressure and chemical concentrations before a final material can be selected. Thermoplastics and elastomers physical characteristics are more sensitive to temperature than metals. For this reason, a rating chart has been developed for each.

MATERIAL RATING FOR THERMOPLASTICS & ELASTOMERS

- Temp. in °F = "A" rating, maximum temperature which material is recommended, resistant under normal conditions.
- B to Temp. in °F = Conditional resistance, consult factory.
- C = Not recommended.
- Blank = No data available.

MATERIAL RATINGS FOR METALS

- A = Recommended, resistant under normal conditions.
- B = Conditional, consult factory.
- C = Not recommended.
- Blank = No data available.

Temperature maximums for thermoplastics, elastomers and metals should always fall within published temp/pressure ratings for individual valves. THERMOPLASTICS ARE NOT RECOMMENDED FOR COMPRESSED AIR OR GAS SERVICE. This guide considers the resistance of the total valve assembly as well as the resistance of individual trim and fitting materials. The rating assigned to the valve body plus trim combinations is always that of the least resistant part. In the cases where the valve body is the least resistant, there may be conditions under which the rate of corrosion is slow enough and the mass of the body large enough to be usable for a period of time. Such use should always be determined by test before installation of the component in a piping system. In the selection of a butterfly valve for use with a particular chemical, the liner, disc, and stem must be resistant. All three materials should carry a rating of "A". The body of a properly functioning butterfly valve is isolated from the chemicals being handled and need not carry the same rating.

ABS — (Acrylonitrile-Butadiene-Styrene) Class 4-2-2 conforming to ASTM D1788 is a time proven material. The smooth inner surface and superior resistance to deposit formation makes ABS drain, waste, and vent material ideal for residential and commercial sanitary systems. The residential DWV system can be exposed in service to a wide temperature span. ABS-DWV has proven satisfactory for use from -40°F to 180°F These temperature variations can occur due to ambient temperature or the discharge of hot liquids into the system. ABS-DWV is very resistant to a wide variety of materials ranging from sewage to commercial household chemical formulations. ABS-DWV is joined by solvent cementing or threading and can easily be connected to steel, copper, or cast iron through the use of transition fittings.

CPVC — (Chlorinated Polyvinyl Chloride) Class 23447-B, formerly designated Type IV, Grade 1 conforming to ASTM D-1784 has physical properties at 73°F similar to those of PVC, and its chemical resistance is similar to or generally better than that of PVC. CPVC, with a design stress of 2000 psi and maximum service temperature of 210°F, has proven to be an excellent material for hot corrosive liquids, hot and cold water distribution, and similar applications above the temperature range of PVC. CPVC is joined by solvent cementing, threading or flanging.

P.P. (Polypropylene) — (PP) Type 1 Polypropylene is a polyolefin which is lightweight and generally high in chemical resistance. Although Type 1 polypropylene conforming to ASTM D-2146 is slightly lower in physical properties compared to PVC, it is chemically resistant to organic solvents as well as acids and alkalies. Generally, polypropylene should not be used in contact with strong oxidizing acids, chlorinated hydrocarbons, and aromatics. With a design stress of 1000 psi at 73°F, polypropylene has gained wide acceptance where its resistance to sulfur-bearing compounds is particularly useful in salt water disposal lines, crude oil piping, and low pressure gas gathering systems. Polypropylene has also proved to be an excellent material for laboratory and industrial drainage where mixtures of acids, bases, and solvents are involved. Polypropylene is joined by the thermo-seal fusion process, threading or flanging. At 180°F., or when threaded, P.P. should be used for drainage only at a pressure not exceeding 20 psi.

PVC — (Polyvinyl Chloride) Class 12454-B, formerly designated Type 1, Grade 1. PVC is the most frequently specified of all thermoplastic materials. It has been used successfully for over 30 years in such areas as chemical processing, industrial plating, chilled water distribution, deionized water lines, chemical drainage, and irrigation systems. PVC is characterized by high physical properties and resistance to corrosion and chemical attack by acids, alkalies, salt solutions, and many other chemicals. It is attacked, however, by polar solvents such as ketones, some chlorinated hydrocarbons and aromatics. The maximum service temperature of PVC is 140°F. With a design stress of 2000 psi, PVC has the highest long term hydrostatic strength at 73°F of any of

the major thermoplastics being used for piping systems. PVC is joined by solvent cementing, threading, or flanging.

PVDF — (KYNAR®) (Polyvinylidene Fluoride) is a strong, tough and abrasion resistant fluorocarbon material. It resists distortion and retains most of its strength to 280°F. It is chemically resistant to most acids, bases, and organic solvents and is ideally suited for handling wet or dry chlorine, bromine and other halogens. No other solid thermoplastic piping components can approach the combination of strength, chemical resistance and working temperatures of PVDF. PVDF is joined by the thermo-seal fusion process, threading or flanging.

EPDM — EPDM is a terpolymer elastomer made from ethylenepropylene diene monomer. EPDM has good abrasion and tear resistance and offers excellent chemical resistance to a variety of acids and alkalines. It is susceptible to attack by oils and is not recommended for applications involving petroleum oils, strong acids, or strong alkalines. It has exceptionally good weather aging and ozone resistance. It is fairly good with ketones and alcohols and has an excellent temperature range from -20°F to 250°F.

HYPALON® (CSM) — Hypalon has very good resistance to oxidation, ozone, and good flame resistance. It is similar to neoprene except with improved acid resistance where it will resist such oxidizing acids as nitric, hydrofluoric, and sulfuric acid. Abrasion resistance of Hypalon is excellent, about the equivalent of the nitriles. Oil and solvent resistance is somewhat between that of neoprene and nitrile Salts have little if any effect on Hypalon. Hypalon is not recommended for exposure to concentrated oxidizing acids, esters, ketones, chlorinated, aromatic and nitro hydrocarbons. Hypalon has a normal temperature range of -20°F to 200°F.

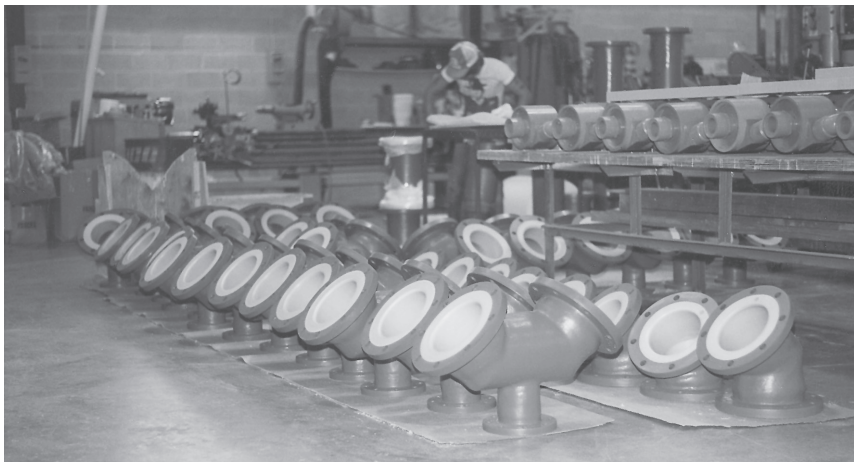
NEOPRENE (CR) — Neoprenes were one of the first synthetic rubbers developed. Neoprene is an all purpose polymer with many desirable characteristics and features high resiliency with low compression set, flame resistance, and is animal and vegetable oil resistant. Neoprene is principally recommended for food and beverage service. Generally, neoprene is not affected by moderate chemicals, fats, greases, and many oils and solvents. Neoprene is attacked by strong oxidizing acids, most chlorinated solvents, esters, ketones, aromatic hydrocarbons, and hydraulic fluids. Neoprene has a moderate temperature range of -20°F to 160°F.

NITRILE (NBR) — (BUNA-N) is a general purpose oil resistant polymer known as nitrile rubber. Nitrile is a copolymer of butadiene and acrylonitrile and has a moderate temperature range of -20°F to 180°F. Nitrile has good solvent, oil, water, and hydraulic fluid resistance. It displays good compression set, abrasion resistance and tensile strength. Nitrile should not be used in highly polar solvents such as acetone and methyl ethyl ketone, nor should it be used in chlorinated hydrocarbons, ozone or nitro hydrocarbons.

FLUOROCARBON (FKM) (VITON®) (FLUOREL®) — Fluorocarbon elastomers are inherently compatible with a broad spectrum of chemicals. Because of this extensive chemical compatibility, which spans considerable concentration and temperature ranges, fluorocarbon elastomers have gained wide acceptance as a material of construction for butterfly valve O-rings and seats. Fluorocarbon elastomers can be used in most applications involving mineral acids, salt solutions, chlorinated hydrocarbons, and petroleum oils. They are particularly good in hydrocarbon service. Fluorocarbon elastomers have one of the broadest temperature ranges of any of the elastomers, -20°F to 300°F, however, are not suitable for steam service.

TEFLON® (PTFE) — Polytetrafluoroethylene has outstanding resistance to chemical attack by most chemicals and solvents. PTFE has a temperature rating of -20°F to 400°F in valve applications. PTFE, a self lubricating compound, is used as a seat material in ball valves.

VITON is a registered trademark of the DuPont Company
TEFLON is a registered trademark of the DuPont Company
HYPALON is a registered trademark of the DuPont Company
KYNAR is a registered trademark of the Pennwalt Company
FLUOREL is a registered trademark of the 3M Company



Chemical Resistance Chart for Valves and Fittings

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Acetaldehyde CH_3CHO	Conc.		C	140	C		C		350	B to 200	C	C	C	A	C	C	C	C	B	B	A		B	B	A		C
Acetamide CH_3CONH_2									200	B to 200	B to 180	B to 200	C		A		A		A	A			A	A	A	A	
Acetic Acid CH_3COOH	25%	C	180	180	140		140	B to 73	350	176	C	70	C	A	C	C	C	C	C	C	C	C	C	A	A	A	C
Acetic Acid CH_3COOH	50%					B to 140	B to 176		350	140	C	C	C	A	C	C	C	C	C	C	C	C	C	A	A	A	C
Acetic Acid CH_3COOH	85%	C	C	120	73		73		350	70	C	C	C	A	C	C	C	C	C	C	C	C	C	A	A	A	C
Acetic Acid CH_3COOH	Glacial	C	C	120	73	B to 104	B to 68		350					A	C	C	C	C	C	C	C	C	C	C	A	B	C
Acetic Anhydride $(CH_3CO)_2O$		C	C	73	C	C	73		350	C	C	B to 70	C	A	C	C	C	C	C	C	C	C	C	C	B	B	C
Acetone CH_3COCH_3		C	C	B	C	B	C	C	350	B to 300	C	C	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Acetophenone $C_6H_5COCH_3$									350	B to 176	C	C	C		C	C	C	C	C	C	C	C	C	C	C		C
Acetyl Chloride CH_3COCl		C	C		C	C			200	C	C	C	B		A	A	A	A	C	C	A		C		A	A	A
Acetylene	Gas, 100%	73	C	73	C		73		250	B to 250	200	104	200		C	C	C	C	A	A	A	A	A		A	A	C
Acrylonitrile $H_2C=CHCN$			C		C		140		350	104	C	C	C	A	A	A	A	A	A	A	A	A	A	A	A	A	
Adipic Acid $COOH(CH_2)_4COOH$	Sat'd.		180	140	140	B to 176	140		350	140	B to 220	B to 160	176						C	C	B		C		B to 200		A
Allyl Alcohol $CH_2=CHCH_2OH$	96%		C	140	B to 73		C		250	B to 300	B to 180	B to 120	B to 70		A	A	A	A	A	A	A	A	A	A	A	A	
Allyl Chloride $CH_2=CHCH_2Cl$			C		C	140	C		350	C	B to 70	C	C								C						
Aluminum Acetate $Al(C_2H_4O_2)_3$	Sat'd.								350	176	C	C	C		C		C			C					A		
Aluminum Ammonium Sulfate (Alum) $AlNH_4(SO_4)_2 12H_2O$	Sat'd.		180	140	140		140		250	B to 200	B to 140	C	190	A	B	B	B	B			C			B	A		B
Aluminum Chloride (Aqueous) $AlCl_3$	Sat'd.	160	180	180	140	B to 212	140		250	176	B to 200	B to 200	176	A	C	C	C	C	C	C	C	C	C	C	A	C	C
Aluminum Fluoride AlF_3	Sat'd.	160	180	180	73	B to 212	140		250	B to 300	B to 200	B to 200	176	A	C	C	C	C	C	C	C		C	C	B	C	C
Aluminum Hydroxide $Al(OH)_3$	Sat'd.	160	180	180	140	B to 212	140		250	176	160	B to 180	176		C	C	C	C	B	B	C		B	B	A	A	C

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI / IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Aluminum Nitrate $Al(NO_3)_3 \cdot 9H_2O$	Sat'd.		180	180	140	B to 212	140		250	176	140	B to 200	B to 400	A	C	C	C	C	C	C	C	C	C		A	A	C
Aluminum Potassium Sulfate (Alum) $AlK(SO_4)_2 \cdot 12H_2O$	Sat'd.	160	180	140	140	B to 212	140		400	B to 200	B to 200	B to 200	248	A	B	B	B	B			C			B	A		B
Aluminum Sulfate (Alum) $Al_2(SO_4)_3$	Sat'd.	160	180	140	140	B to 212	140		250	B to 300	B to 300	B to 200	B to 390	A	C	C	C	C	C	C	C		C	C		B	
Ammonia Gas NH_3	100%	C	C	140	140		140		400	140	B to 140	140	C	A	B			C	A		A				A	A	B
Ammonia Liquid NH_3	100%	160	C	140	C		140		400	212	70	B to 160	C	A	C	C	C	C			A			A	A	A	C
Ammonium Acetate CH_3COONH_4	Sat'd.	120	180	73	140	B to 212	140		400	140	140	140			C	C	C	C							B		
Ammonium Bifluoride NH_4HF_2	Sat'd.		180	180	140		140		400	140	B to 140	C	140	A	C			C	C	C	C	C	C	C	B	B	B
Ammonium Carbonate $(NH_4)_2CO_3$	Sat'd.		180	212	140	B to 248	140		400	176	B to 200	B to 200	212		C			C			A to 140	C		B	B	B	B
Ammonium Chloride NH_4Cl	Sat'd.	120	180	212	140	B to 212	140		400	300	B to 200	B to 212	250	A	C			C	C	C	C	C	C	C	B	C	
Ammonium Fluoride NH_4F	10%	120	180	212	140	B to 212	140		400	300	B to 200	B to 100	140	A	C			C			C				C		C
Ammonium Fluoride NH_4F	25%	120	180	212	C		140		400	300	B to 120	B to 100	140	A	C			C			C				C		C
Ammonium Hydroxide NH_4OH	10%	120	C	212	140		140		400	B to 300	200	200	B to 190	A	C	C		C			C			B	A	A	C
Ammonia Hydroxide NH_4OH	Sat'd.								400	B to 300	C	200	B to 190	A	C	C					C			B to 70	A to 140		C
Ammonium Nitrate NH_4NO_3	Sat'd.	120	180	212	140	B to 212	140		400	B to 300	200	200	176	A	C	C		C								A	C
Ammonium Persulphate $(NH_4)_2S_2O_8$			180	140	140	B to 212	140		200	B to 70	C	70	B to 140		C	C	C	C	C	C	C	C	C	B	A		C
Ammonium Phosphate (Monobasic) $NH_4H_2PO_4$	All	120	180	212	140	B to 248	140		400	B to 200	200	B to 200	B to 180	A	C	C	C	C	B	B	C		B	A	A	A	C
Ammonium Sulfate $(NH_4)_2SO_4$		120	180	212	140	B to 212	140		400	300	200	200	176	A	C	C	C	C	B	B	C	B	B	B	B	B	C
Ammonium Sulfide $(NH_4)_2S$	Dilute	120	180	212	140		140		350	B to 300	B to 180	B to 160	B to 70		C	C	C	C	C	C	C		C		B		C
Ammonium Thiocyanate NH_4SCN	50 - 60%	120	180	212	140	B to 212	73			B to 300	B to 180	B to 200	B to 190		C	C	C	C	C	C	C		C		A	A	C
Amyl Acetate $CH_3COOC_5H_{11}$		C	C	C	C	B 122	73		100	210	C	C	C		B	B	B	B	B	B	B	A	B	A	A	A	
Amyl Alcohol $C_5H_{11}OH$			C		C	B to 212	B to 140		400	B to 300	B to 180	B to 200	B to 212	A	A	A	A	A	B	B	B		B	A	A	A	A

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
n-Amyl Chloride $CH_3(CH_2)_3CH_2Cl$		C	C	C	C		C		400	C	C	C	200		A	A	A	A	A	A	A	A	A	A	A	A	
Aniline $C_6H_5NH_2$		C	C		C	B to 68	C		200	B to 140	C	C	B to 70	A	C	C	C	C	B	B	C	B	B	A	A	A	C
Aniline Hydrocloride $C_6H_5NH_2 \cdot HCl$	Sat'd.		C		C		140							C	C	C	C	C	C	C	C	C	C	C	C	C	
Anthraquinone $C_{14}H_8O_2$			180		140		C						C						C	C	C						
Anthraquinone Sulfonic Acid $C_{14}H_7O_2 \cdot SO_3 \cdot H_2O$			180	73	140		C																				
Antimony Trichloride $SbCl_3$	Sat'd.		180	140	140	B to 140	140			C	70	B to 70	70	A	C	C	C	C	C	C	C	C	C	C	C	C	
Aqua Regia (Nitrohydrochloric Acid)		C	B to 73	C	C	C	C		200	C	C	C	B to 190	C	C	C	C	C	C	C	C	C	C		B		
Argon Ar	Dry								350	B to 400	250	B to 100	B to 500		A		A		A		A				A	A	A
Arsenic Acid H_3AsO_4	80%		180	140	140	B to 248	140		400	B to 176	B to 200	B to 180	140	A	C	C	C	C	C	C	C		C	B	A	B	
Asphalt			C	73	C		73		350	C	C	C	212		A	A	A	A	A	A	A	A	A	A	A	A	A
Barium Carbonate $BaCO_3$	Sat'd.	120	180	140	140	B to 248	140		400	B to 300	140	B to 160	248		A	A	A	A	B	B	B	B	B	A	A	A	
Barium Chloride $BaCl_2 \cdot 2H_2O$	Sat'd.	120	180	140	140	B to 212	140		400	B to 300	B to 200	B to 160	B to 400	A	A	A	A	A	B	B	C	B	B	B	A		A
Barium Hydroxide $Ba(OH)_2$	Sat'd.	73	180	140	140				400	B to 300	B to 220	B to 200	248		C	C	C	C	B	B	C		B	A	A	A	
Barium Nitrate $Ba(NO_3)_2$	Sat'd.	73	180	140	73		140		250	176	140	B to 200	248	A	C	C	C	C	A	A	A		A		A		
Barium Sulfate $BaSO_4$	Sat'd.	73	180	140	140	B to 212	140		400	B to 300	B to 200	B to 200	B to 380	A	B	B	B	B	B	B	A		B	A	A	A	
Barium Sulfide BaS	Sat'd.	73	180	140	140				400	B to 310	B to 200	B to 200	B to 400		C	C	C	C	B	B	C		B	A	A	A	C
Beer		120	180	180	140	B to 248	B to 140		300	120	B to 250	B to 140	B to 300		A	A	A	A	C	C	C		C	A	A	A	A
Beet Sugar Liquors			180	180	140		73			B to 300	200	B to 180	B to 400				A		B	B	B				A	A	
Benzaldehyde C_6H_5CHO	10%	C	B to 73	73	B to 73		73			200	C	C	C	A	A	A	A	A	C	C	B		C	A	A	A	A
Benzene C_6H_6		C	C	C	C	C	B to 68	C	250	C	C	C	B to 140	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Benzene Sulfonic Acid $C_6H_5SO_3H$	10%		180	180	140		B to 73			C	C	B to 100	200		B	B	B	B	C	C	C		C	B	B	B	
Benzoic Acid C_6H_5COOH		160	180	73	140				350	C	C	B to 150	176		C	C	C	C	C	C		C	A	A	A	A	

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Benzyl Alcohol $C_6H_5CH_2OH$			C	120	C	B to 122	140		400	C	C	B to 70	B to 250		A	A	A	A	B	B	B		B	A	A	A	A
Bismuth Carbonate $(BiO)_2CO_3$			180	180	140		140			70	70	70	B to 200														
Black Liquor	Sat'd.		180	140	140		120		225	220	140	70	212		C	C	C	C	B	B	B		B	B	A	B	
Bleach (Sodium Hypochlorite)	12% Cl	73	185	120	140		73																				
Blood									200	70	C	70	70		B		B		C	C			B		A	A	
Borax $Na_3B_4O_7{\bullet}_{10}H_2O$	Sat'd.	160	180	212	140		140			300	B to 200	B to 200	200		A	A	A	A	A	A	B	A	A	A	A	A	
Boric Acid H_3BO_3	Sat'd.	160	180	212	140	B to 212	140			B to 300	B to 200	B to 200	185	A	B	B	B	B	C	C	B		C	B	A	B	
Brine	Sat'd.		180	140	140		140		400	B	B	B	B		A	A	A		C	C	C	B	C	B	A	B	
Bromic Acid $HBrO_3$			180	C	140	B to 212	C			200	C	C	200		C	C	C	C									C
Bromine Br_2	Liquid	73	C	C	C	B to 248	C		300	C	C	C	B to 350	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Bromine Br_2	Gas, 25%		180	C	140		C		200	C	C	C	B to 180	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Bromine Water	Sat'd.		180	C	140	B to 176	C		300	C	C	C	B to 210	C	C	C	C	C	C	C	C		C				C
Butadiene $H_2C{=}CHHC{=}CH_2$	50%		180	C	140		73		C	C	C	C	70		A	A	A	A	A	A	A	A	A	A	A	A	A
Butane C_4H_{10}	50%		180	140	140		140	73	350	C	B to 250	B to 200	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	A
Butyl Acetate $CH_3COOCH_2CH_2CH_2CH_3$		C	C	C	C	C	C		175	C	C	C	C		B	B	B	B	B	B	B		B	A	A	A	
Butyl Alcohol $CH_3(CH_2)_2CH_2OH$			C	180	140		140		300	B to 250	B to 190	140	B to 390	A	B	B	B			B			A	A	A	A	B
Butyl Cellosolve			C		73				200	B to 300	C	C	C	A	A	A	A	A	A	A			A	A	A	A	
n-Butyl Chloride C_4H_9Cl		C	C						400	C	C	C	70		B	B	B	B	B	B	B		B	B	B	B	
Butylene © $CH_3CH{=}CHCH_3$	Liquid			C	140		120		400	C	250	C	B to 400		A	A	A	A			A			A	A	A	
Butyl Phthalate $C_{16}H_{22}O_4$			C	180		B 140				250	C	C	C														
Butyl Stearate					73				250	C	C	C	B to 400		A	A	A	A	B	B			B	A	A	A	
Butyric Acid $CH_3CH_2CH_2COOH$		C	C	180	73		73		300	C	C	C	C		A	A	A	A	C	C	C	C	C	B	A	A	
Calcium Bisulfide $Ca(HS)_2{\bullet}_6H_2O$			73		C		140		200	200	B to 140	140	140												A		

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Calcium Bisulfite $Ca(HSO_3)_2$			180	180	140		C		350	C	B to 200	B to 200	B to 400		C	C	C	C	C	C	C		C	B	A		
Calcium Carbonate $CaCO_3$			180	180	140	B to 248	140		350	B to 210	B	140	248		C	C	C	C	B	B	B		B	A	A	A	A
Calcium Chlorate $Ca(ClO_3)_2 \cdot {}_2H_2O$			180	180	140	B to 248	140		350	B to 200	B to 200	B to 200	B to 190	140	B	B	B	B	B	B	B	B	B	B	A		C
Calcium Chloride $CaCl_2$		120	180	180	140	B to 248	B to 176		350	B to 212	B to 200	B to 200	300	A	B	B	B	B	A	A	C		C	B	A	B	B
Calcium Hydroxide $Ca(OH)_2$		160	180	180	140		140		250	210	B to 200	B to 220	212		C	C	C	C	C	C	C		C	A	A	A	C
Calcium Hypochlorite $Ca(OCl)_2$	30%	160	180	140	140		140		200	B to 310	C	C	B to 400	90	C	C	C	C	C	C	C		C	B	B	B	C
Calcium Nitrate $Ca(NO_3)_2$			180	180	140		140		200	B to 300	B to 200	B to 200	B to 390	C	B	B	B	B	B	B			B		A		B
Calcium Oxide CaO			180		140		140			B	B to 200	B to 200	140						A	A	B				A	A	
Calcium Sulfate $CaSO_4$		100	180	180	140	B to 212	140		200	B to 300	B to 176	B to 70	B to 212	A	A	B	B	B	A	A	B	A	A	A	A	A	A
Camphor $C_{10}H_{16}O$		C		73	73		73		350	C	100	C	70		B	B	B	B	B	B	B		B	A	A	A	
Cane Sugar $C_{12}H_{22}O_{11}$			180	180	140		140		400						A	A	A	A	A	A	A	A	A	A	A	A	
Caprylic Acid $CH_3(CH_2)COOH$									350		C		B to 140						A	A	B		A		A		
Carbitol			C		73				200	B to 80	B to 80	C	C		B	B	B	B	B	B	B		B		B		
Carbon Dioxide CO_2	Dry, 100%	160	180	140	140	B to 212	140		400	B to 250	200	B to 200	212	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Carbon Dioxide CO_2	Wet	160	180	140	140		140		400	B to 250	140	C	212	A	A	A	A	A	B	B	B	B	B	A	A	A	A
Carbon Disulfide CS_2		C	C	C	C		B to 68		200	C	C	C	B to 400	A	B	B	B	B	A	A	A		A	A	A		C
Carbon Monoxide CO	Gas		180	180	140	B to 140	140		400	B to 300	160	140	B to 400	A	A	A	A	A	A	A	B		A	A	A	A	
Carbon Tetrachloride CCl_4		C	C	C	73	C	C	B to 73	350	C	C	C	B to 350	A	A	A	A	A	C	C	A		C	A	A	A	B
Carbonic Acid H_2CO_3	Sat'd.	185	180	140	140		140		350	B to 300	70	200	B to 400	A	C	C	C	C	B	B	B	B	B	A	A	A	
Castor Oil			C	140	140		73		350		212	200	B to 400	550	A	A	A	A	A	A	A	A	A	A	A	A	A
Caustic Potash (Potassium Hydroxide) KOH	50%	160	180	180	140		140			200	B to 150	B to 70	B to 140														

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Caustic Soda (Sodium Hydroxide) Na0H	40%	160	180	180	140		140			B to 200	212	B to 200	80														
Cellosolve			C	73	73		C		200		C		C	A	A	A	A	A	A	A	A		A		A		
Cellosolve Acetate $CH_3COOCH_2CH_2OC_2H_5$			C	73	73				300	C	C	C	C		B		B			B					B		
Chloral Hydrate $CCl_3CH(OH)_2$			180	C	140		120			B to 70	C	70	C														
Chloramine NH_2Cl	Dilute		C	73	73		73			70		B to 80	70		B	B	B	B	C	C	C				B		
Chloric Acid $HClO_3 \cdot {}_7H_2O$	10%		180	73	140		73		140	212	C	B to 120	B to 120		C	C	C	C	C	C	C	C	C	C	B	C	
Chloric Acid $HClO_3 \cdot {}_7H_2O$	20%		185	73	140		73		140	212	C	70	C		C	C	C	C	C	C	C	C	C	C	C	C	
Chlorine Gas (Moisture Content < 150 ppm)									400	C	C	C	B	A	C	C	C	C	B	A*	A*	B	B	B	A		C
Chlorine Gas (Moisture Content > 150 ppm)		C	C	C	C		C		400	C	C	C	C		C	C	C	C	C	C	C	C	C	C	C	C	C
Chlorine	Liquid	C	C	C	C		C			C	C	C	B		B	B		B	C	C	C		C	C	C	C	
Chlorinated Water (< 3500 ppm)									400					73	B	B	C	C			C		C	B	A	A	C
Chlorinated Water (> 3500 ppm)									400					73	C	C	C	C			C			C	A	B	C
Chloroacetic Acid $CH_2ClCOOH$	50%	C	180	C	140		120		200	B to 175	C	C	C		C	C	C	C	C	C	C		C	C	C	C	C
Chlorobenzene C_6H_5Cl	Dry	C	C	73	C		C	C	200	C	C	C	B to 400	A	A	A	A	A	C	C	B		C	A	A	A	
Chloroform $CHCl_3$	Dry	C	C	C	C		C	C	200	C	C	C	B to 400	A	A	A	A	A	C	C	C		C	A	A	A	
Chlorosulfonic Acid $ClSO_2OH$			73	C	73		C		200	C	C	C	C		C	C	C	C	B	B	C	C	B	C	C	C	C
Chromic Acid H_2CrO_4	10%	73	180	140	140	B to 212	73		350	70	C	C	B to 400	C	C	C	C	C	C	C	C	C	C	B to 212	A to 70		C
Chromic Acid H_2CrO_4	30%	C	180	73	140	B to 212	73		350	70	C	C	B to 400	C	C	C	C	C	C	C	C	C	C	B to 212	B to 70		C
Chromic Acid H_2CrO_4	50%	C	C	73	C	B to 212	73		200	C	C	C	B to 400	C	C	C	C	C	C	C	C	C		C	B to 70		C
Citric Acid $C_6H_8O_7$	Sat'd.	160	180	140	140	B to 248	140		200					A	C	C	C	C	C	C	C		C	B	A	A	C
Coconut Oil			C	73	140	B to 248	73		400	C	250	C	B to 390		B	B	B	B	C	C	B		C	B	A		
Coffee			180	140	140		140			B to 140	140	140	B to 200		A	A	A	A	C	C	C			A	A	A	A
Coke Oven Gas				73	140		140		400	C	C	C	B to 390		B	B	B	B	A	A	A	A	A	A	A	A	

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Copper Acetate $Cu(C_2H_3O_2)_2 \cdot H_2O$	Sat'd.		73	73	73				350	B to 300	C	C	C		C	C	C	C	C	C	C		C	B	A		
Copper Carbonate $CuCO_3$	Sat'd.		180		140		140		350	B to 210	C	70	B to 190											B	A		
Copper Chloride $CuCl_2$	Sat'd.	73	180	140	140		140		350	B to 212	176	B to 210	B to 400	A	C	C	C	C	C	C	C	C	C	B	A		C
Copper Cyanide CuCN			180		140	B to 212	140		350	B to 300			B to 390		C	C	C	C	C	C	C	A	C	B	A		C
Copper Fluoride $CuF_2 \cdot 2H_2O$	2%		180	73	140		140			B to 250	80	140	B to 190	A													
Copper Nitrate $Cu(NO_3)_2 \cdot 3H_2O$	30%		180	140	140					B to 210	B to 230	B to 200	212	A	C	C	C	C	C	C	C		C	B	A		C
Copper Sulfate $CuSO_4 \cdot 5H_2O$	Sat'd.	120	180	120	140	B to 212	140			B to 300	B to 212	200	B to 212	A	C	C	C	C	C	C	C		C	A	A	A	C
Corn Oil			C	73	140		120		400	C	250	C	B to 400		B	B	B	B	B	B	B	B	B	A	A	A	A
Corn Syrup			185	140	140		140			200	200	C	212														
Cottonseed Oil		120	C	140	140		B to 140		400	B to 70	200	C	B to 400		B	B	B	B	B	B	B		B	A	A	A	
Creosote			C	73	C		140		350	C	B to 220	C	B to 400		B	B	B	B	A	A	A	A	A	A	A	A	B
Cresol $CH_3C_6H_4OH$	90%	C	C	B to 73	C	B to 68	73		200		C	C	B												B		
Cresylic Acid	50%		180		140		C		200	C	C	C	140		A	A	A	A	A	A	B	A	A	A	A	A	A
Crude Oil			C	140	140	B to 212	C		400	C	B to 250	C	B to 300		C	C	C	C	C	C	B			A	A	A	C
Cuprlc Sulfate $CuSO_4 \cdot 5H_2O$	Sat'd.	100	180	73	140				250					A													
Cuprous Chloride CuCl	Sat'd.	70	180		140		140		350					A	C			C									C
Cyclohexane C_6H_{12}		73	C	C	C	B to 248	C		300	C	250	C	B to 400		A	A	A	A	B	B	A		B	A	A	A	
Cyclohexanol $C_6H_{11}OH$		C	C	140	C	B to 104	73		250	C	B to 70	B to 70	B to 400						A	A			A	A	A	A	
Cyclohexanone $C_6H_{10}O$	Liquid	C	C	73	C	C	C	C	200	C	C	C	C		B	B	B	B	B	B	B		B	B	A		
Detergents (Heavy Duty)			C	180	140		B to 140								A	A	A	A	A	A	A	A	A	A	A	A	A
Dextrin (Starch Gum)	Sat'd.		180	140	140		140		200	176	B to 180	B to 200	212		A	A	A	A	B	B	B				A		A
Dextrose $C_6H_{12}O_6$			180	140	140		140		400	200	200	200	B to 400		A	A			A						A		
Diacetone Alcohol $CH_3COCH_2C(CH_3)_2OH$			C	120	C				350	B to 300	C	C	C		A	A	A	A	A	A	A	A	A	A	A	A	A

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI / IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Dibutoxyethyl Phthalate $C_{20}H_{30}O_6$			C		C										A	A	A	A	A	A	A		A		A		
Dibutyl Phthalate $C_6H_4(COOC_4H_9)_2$		C	C	73	C		73		350	B to 250	C	C	C		A	A	A	A	A	A	A				A		
Dibutyl Sebacate $C_4H_9OCO(CH_2)_8OCOC_4H_9$				73	73		73		350	C	C	C	C														
Dichlorobenzene $C_6H_4CI_2$		C	C	C	C		C			C	C	C	B						A	A			A		A		
Dichloroethylene $C_2H_4CI_2$			C	C	C		C		350	C	C	C	200				B			B					B		
Diesel Fuels			C	140	140	B to 212	73		350	C	B	C	C		A	A	A	A	A	A	A	A	A	A	A	A	A
Diethylamine $C_4H_{10}NH$		C	C		C	C	C		200	70	C	70	C	A	C	C	C	C	A	A	C			A	A	A	C
Diethyl Cellosolve $C_6H_{14}O_2$																			A	A			A		A		
Diethyl Ether $C_4H_{10}O$		C	C	73	73		C	B to 73		C	C	C	C	A													
Diglycolic Acid $0(CH_2COOH)_2$	Sat'd.		180	140	140		140		250	B to 300	200	B to 200	C														
Dimethylamine $(CH_3)_2NH$				73	140	C	73			B to 140	C	C	C						C						A		
Dimethyl Formamide $HCON(CH_3)_2$		C	C	180	C		120	C	250	B to 122	C	C	C		B	B	B	B	B	B	B				A		
Dioctyl Phthalate $C_6H_4(COOC_8H_{17})_2$		C	C	C	C		73		200	C	C	C	C		A	A	A	A	C	C	C						
Dioxane $C_4H_8O_2$			C	C	C		140			B to 160	C	C	C	A	A	A	A	A	A	A	A					A	
Diphenyl Oxide $(C_6H_5)_2O$	Sat'd.						73			C	C	C	B to 310		A	A	A	A	A								
Disodium Phosphate Na_2HPO_4			180	140	140		140		400	B to 210	70	80	90	A	B	B	B	B	B	B					A		
Dow Therm A $C_{12}H_{10}•C_{12}H_{10}O$					C				212	C	C	C	B to 350	A	A	A	A	A	B	A	A		A	A	A	A	
Ether ROR		C	C	C	C		73			C	C	C	C		A	A	A		B	B	B	A	A	A	A	A	A
Ethyl Acetate $CH_3COOCH_2CH_3$		C	C	C	C		73	C	200	B to 158	C	C	C		A	A	B		A	A	A			A	A	A	
Ethyl Acrylate $CH_2=CHCOOC_2H_5$			C		C				350	C	C	C	C		A	A			A	A	A		A	A	A	A	
Ethyl Alcohol (Ethanol) C_2H_5OH			C	140	140		140	73	300	200	B to 200	158	C	A	A	A	A	A	A	A	A	A	A	A	A	A	
Ethyl Benzene $C_6H_5C_2H_5$				C	C				350	C	C	C	70		B	B			B	B	B		B		A		
Ethyl Chloride C_2H_5CI	Dry		C	C	C		C		350	140	200	C	B to 400	A	A	A	B		A	A	A	A	A	A	A	A	

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Ethylene Bromide $BrCH_2CH_2Br$	Dry		C		C				350						A					A	A				A		
Ethylene Chloride (Vinyl Chloride) CH_2CHCl	Dry	C	C	C	C		C		350	C	C	C	200												A		
Ethylene Chlorohydrin $ClCH_2CH_2OH$			C	73	C				200	C	C	C	70	A								A					
Ethylene Diamine $NH_2CH_2CH_2NH_2$		C		73	C		140			B to 300	80	B to 90	C		A	C		A	A	B				A		A	A
Ethylene Dichloride $C_2H_4Cl_2$	Dry	C	C	C	C		C		350	C	C	C	B to 400	A	A	A			A	A	A		A		A	A	
Ethylene Glycol $OHCH_2CH_2OH$		73	C	212	140	B to 212		B to 220	400	250	250	250	B to 250	A	A	A	A	A	A	A	A		A	A	A	A	A
Ethylene Oxide CH_2CH_2O			C	C	C		73		400	C	C	C	C		A	A			B	A	A		A		A		
Ethyl Formate										C	C	C	B to 400		A	A			A	A			A		A		
Fatty Acids R-COOH		160	73	120	140		120		400	C	B to 250	C	250	A	C	C	C	C	C	C	C		C		A		
Ferric Chloride (Aqueous) $FeCl_3$	Sat'd.	120	180	140	140	B to 212	140		400	B to 300	B to 200	160	176	A	C	C	C	C	C	C	C	C		C	C	C	C
Ferric Hydroxide $Fe(OH)_3$	Sat'd.	160	180	140	140		140		400	B to 210	B to 176	B to 200	B to 200						C	C			C		A		C
Ferric Nitrate $Fe(NO_3)_3 \bullet {}_9H_2O$	Sat'd.	160	180	140	140	B to 212	140		400	B to 300	B to 176	B to 200	B to 400	A	C	C	C	C	C	C	C		C	B	A	A	C
Ferric Sulfate $Fe_2(SO_4)_3$		160	180	140	140	B to 212	140		200	B to 280	B to 200	B to 200	176	A	C	C	C	C	C	C	C		C	B	A	A	C
Ferrous Chloride $FeCl_2$	Sat'd.	160	180	140	140	B to 212	140		400	210	B to 200	200	185	A	C	C	C	C	C	C	C	C	C	C	C	C	C
Ferrous Hydroxide $Fe(OH)_2$	Sat'd.	160	180	140	140		140		400	B to 200	B to 176	B to 200	212						C						A		
Ferrous Nitrate $Fe(NO_3)_2$		160	180	140	140		140		400	B to 210	B to 200	B to 200	212	A											A	A	
Ferrous Sulfate $FeSO_4$		160	180	140	140	B to 212	140		400	B to 200	B to 200	B to 200	B to 200	A	C	C	B		C	C	C	C	C	A	A	A	B
Fish Oil			180	180	140		140		300	C	250	B to 70	B to 400		A	A	C		B	A	A		A	A	A	A	A
Flue Gas															A	A			A	A	A		A	A	A	A	
Fluoroboric Acid HBF_4		73	73	140	140		140		350	70	C	70	140		B	B			C	C			C		A		C
Fluorine Gas F_2	Dry, 100%		73	C	73		C		C		C		C	B to 300	B	B			C	C	A				A	A	
Fluorine Gas F_2	Wet	C	73	C	73		C		C		C		C	C	C	C			C	C	C				A	A	

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Fluorosilicic Acid (Hydrofluosilicic Acid) H_2SiF_6	50%		73	73	140	B to 212			300	B to 300	160	158	185							C	C		C	B	B	B	C
Formaldehyde HCHO	Dilute	160	73	140	140	B to 176			300	212	140	150	C	A	A	A	B		C	C	B			A	A	A	
Formaldehyde HCHO	35%	160	C	140	140	B to 212	140	100	300	212	140	150	C	A	A	A	B		C		B			A	A	A	
Formaldehyde HCHO	50%		C		140		140		300	B to 140	C	B to 70	C	A	B	B	B		C		B			B	A	A	
Formic Acid HCOOH		C	C	140	73	B	140		300	210	C	B	B	A	C	C	B		C	C	C	B	C	A	A	A	
Freon 11 CCl_3F	100%	C	73	C	140		73		300	C	B to 250	C	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon 12 CCl_2F_2	100%		73	73	140		73		C	B	B	B	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon 21 $CHCl_2F$	100%			C	C		C		300	C	C	C	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon 22 $CHClF_2$	100%		73	73	C		C		C	140	C	250	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon 113 $C_2Cl_2F_3$	100%			C	140		73		300	C	B	B	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Freon 114 $C_2Cl_2F_4$	100%			C	140		73		300	B	B	B	C	A	A	A	A	A	B	B	B		B	A	A	A	A
Fructose $C_6H_{12}O_6$	Sat'd.	73	180	180	140		140		300										A	A			A	A	A	A	
Furfural C_4H_3OCHO		C	C	C	C		C		300	B to 160	C	C	C		A	A	A	A	A	A	A		A	A	A	A	A
Gallic Acid $C_6H_2(OH)_3CO_2H{\bullet}H_2O$			73		140		73		300	C	C	C	B to 400		B	B	C		C	C	C		C	A	A	A	
Gasoline (Leaded)		C	C	C	B		73		200	C	190	C	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Gasoline (Unleaded)		C	C	C	B		73		200	C		C	190	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Gasohol		C	C	C	B		73		200					A	A	A	A	A	A	A	A	A	A	A	A	A	A
Gasoline (Sour)		C	C	C	B		C		200	C	250	C	B to 250	A	B	B			A	A	A		A	B	A	A	
Gelatin			180	180	140		140		300	200	200	200	212		C	C	B		C	C	C		C	C	C	A	
Glauber's Salt									200	B to 200	C	B to 200	B to 400		A	A		A	A	A			A	A	A	A	
Glucose $C_6H_{12}O_6{\bullet}H_2O$		120	180	212	140		140		400	B to 212	200	200	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	A
Glue				140	140		140		400	B	B	B	B		A	A	A	A	A	A	A	A	A	A	A	A	A
Glycerin $C_3H_5(OH)_3$		140	180	212	140		140	B to 320	400	B to 200	250	B to 180	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Glycol Amine															C	C	C		A	A	A		A		A		
Glycolic Acid $OHCH_2COOH$	Sat'd.		180	73	140		140		200	140	B	140	C		B	B			C	C	C		C		A		

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Glyoxal OCHCHO							140								B	B	B		C	C	C		C		A	A	
Grease										C	100	C	140		C	C	C	C	A	A	A		A		A	A	
Green Liquor		160	180		140					B to 300	B to 200	B to 160	B to 400		C	C	C		A	A		A	A		A	A	
Gypsum	Slurry								350						A	A	B	B	A	A	B	A	A	A	A	A	A
Heptane C_7H_{16}		73	180	C	140		73		300	C	250	B to 200	200		A	A	A		A	A	A	A	A	A	A	A	
n-Hexane C_6H_{14}		C	73	73	73				300	C	250	B to 140	B to 250		A	A	A		A	A	A	A	A	A	A	A	
Hexanol $CH_3(CH_2)_4CH_2OH$			180		140		140		300	C	140	C	212		A	A	A		A	A	A		A	A	A	A	
Hydraulic Oil (Petroleum)					73		73		300	C	250	C	70	A	A	A	B		A	A	A		A	A	A		
Hydrazine H_2NNH_2			C	73	C				250		C	C	C	A	C	C	C	C	C	C	C		C		A		
Hydrobromic Acid HBr	20%	73	73	140	140	B to 212	140		250	B to 300	C	C	200	A	C	C	C	C	C	C	C	C	C	C	C	C	C
Hydrobromic Acid HBr	50%	C		120		B to 140	140		250	200	C	C	200	A	C	C	C	C	C	C	C	C	C	C	C	C	C
Hydrochloric Acid HCl	10%	C	180	140	140	B to 212		73	250	176	B to 150	140	230	A	C	C	C	C	C	C	C	C	C	C	B	C	C
Hydrochloric Acid HCl	30%	C	180	140	140	B to 212			250	B to 130	B to 70	B to 100	160		C	C	C	C	C	C	C	C	C	C	B	C	C
Hydrocyanic Acid HCN	10%	160	180	73	140	B to 248	140		250	B to 300	B to 200	C	B to 400		C	C	C	C	C	C	C	C	C	C	A	B	C
Hydrofluoric Acid HF	Dilute	73	73	180	73	B to 212	140		300	212	B to 70	B to 185	212	A	C	C	C	C	C	C	C	C	C	C	C	C	C
Hydrofluoric Acid HF	30%	C	73	140	73		140		300	B to 140	C		212	A	C	C	C	C	C	C	C	C	C	C	C	C	C
Hydrofluoric Acid HF	50%	C	C	73	73	B to 212	120		300	B to 140	C	C	70	A	C	C	C	C	C	C	C	C	C	C	C	C	C
Hydrofluosilicic Acid	50%								300	140	B to 220	C	B to 400	C	B	B			C	C	C		C	B	B	B	C
Hydrogen H_2	Gas		73	140	140	B to 248	140		300	200	B to 220	200	210		A	A	A	A	A	A	A	A	A	A	A	A	A
Hydrogen Peroxide H_2O_2	50%		180	73	140	B to 212	140	B to 73	300	B to 100	C	C	70	A	C	C	C	C	C	C	B	C	C	A	A	A	C
Hydrogen Peroxide H_2O_2	90%		180	C	140		73		30	B to 70	C	C	C	C	C	C	C	C	C	C	B	C	C	A	A	A	C
Hydrogen Sulfide H_2S	Dry		180	150	140	B to 248	140			250	140	140	C	A	B				B		B				A	B	
Hydrogen Sulfide H_2S	Wet		180		140		140			130	C	70	C	A	C	C	C	C	C	C	C		C	C	A	C	C

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Hydrogen Sulfite H_2SO_3															C	C	C	C	C	C	C		C	C	A		C
Hypochlorous Acid HOCl	10%	73	180	73	140	B to 212	140		300	104	C	C	120														C
Inks				140			140		300	B	B	B	70		A	A	A		C	C	C		C		A		
Iodine I_2	10%	C	73	73	C	B to 176	C		200	B to 160	80	B to 80	190	B to 70	C	C	C	C	C	C	C		C	C	C	C	C
Iron Phosphate														A	C	C	C	C					B	A	A	A	C
Isobutane									140	C	250	C	250		A	A	A	A	A	A	A	A	A	A	A	A	A
Isobutyl Alcohol $(CH_3)_2CHCH_2OH$		C	C	73			140		300	B to 300	C	160	B to 400												A		
Isooctane $(CH_3)_3CCH_2CH(CH_3)_2$				C			73	73	300	C	250	C	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Isopropyl Acetate $CH_3COOCH(CH_3)_2$		C	C				73		200	B to 160	C	C	C	A	A				A	A	A		A	A	A	A	A
Isopropyl Alcohol $(CH_3)_2CHOH$			C	212	140	C	140	B to 130	300	160	70	B to 120	170	550	A	A	A	A	A	A	A	A	A	A	A	A	A
Isopropyl Ether $(CH_3)_2CHOCH(CH_3)_2$			C	C	C		73		140	C	C	C	C		A	A		A	A	A	A	A	A	A	A	A	
JP-3 Fuel									200	C	70	C	140		A	A	A	A	A	A	A	A	A	A	A	A	A
JP-4 Fuel			C	C	B		73		300	C	250	C	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	A
JP-5 Fuel			C	C	B		73		300	C	250	C	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	A
JP-6 Fuel									200	C	B to 120	C	70		A	A	A	A	A	A	A	A	A	A	A	A	A
Kelp Slurry															B	B	B	B	B	B	B		B	A	A	A	
Kerosene		73	B	C	B		C		250	C	250	C	B to 400	A	A	A	A	A	A	A	A	A	A		A	A	A
Ketchup					73				250	210	200	70	200		C	C	C		C	C	C		C	B	A	A	
Ketones		C	C	C	C		73		200	200	200	C	C	A	A	A	A		A	A	A		A	A	A	A	
Kraft Liquors		73	180		140		120		250						C	C	C	C	C	C	C		C		A		
Lactic Acid $CH_3CHOHCOOH$	25%	73	180	212	140		140		300	212	80	70	B to 400	A	C	C	C	C	C	B	C		B	A	A	A	
Lactic Acid $CH_3CHOHCOOH$	80%	C	C	140	73		140		300	176	80	70	B to 400	A	C	C	C	C	C	B	C		B	A	A	A	
Lard Oil			C		140		C		300						C	C	C	C	B	B	B		B		A		C
Latex				140			140		200	B to 200	200	160	160		A	A			A	A			A		A		
Lauric Acid $CH_3(CH_2)_{10}COOH$			180	140	140		120		300	C	70	70	70						C	C			C		A		
Lauryl Chloride $CH_3(CH_2)_{10}CH_2Cl$			73		140	B to 248	120		300										C	C			C		A		

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Lead Acetate $Pb(CH_3COO)_2 \cdot 3H_2O$	Sat'd.		180	180	140	B to 212	140		300	200	B to 140	B to 140	C		C	C			C	C	C		C		A		
Lead Chloride $PbCl_2$			180	140	140		120		300	176	140	C	212	A													
Lead Nitrate $Pb(NO_3)_2$	Sat'd.		180	140	140		120		300	B to 300	B to 220	200	212	A							A				A		
Lead Sulfate $PbSO_4$			180	140	140		120		300	B to 210	120	B to 180	212	A	B	B			C	C	C		C		B		
Lemon Oil			C	C				B to 73	300	C	70	C	70						C	C			C	B	A	A	
Lime Sulfur			73	73	73		120			B to 300	B to 220	B to 180	B to 420		C	C	C	C	A	A	A		A		A		
Linoleic Acid			180	180	140				300	C	C	C	C		C	C	C	C	C	C	C		C	C	B	B	C
Linseed Oil		73	C	140	140	B to 248	B to 73		300	C	200	B to 180	250		A	A	A	A	A	A	A	A	A	A	A	A	A
Lithium Bromide LiBr				140	140		140	B to 212	300					A													
Lithium Chloride LiCl				140	140		120			160	160	160	160	A	B	B	B		B	B	C		B		A		
Lithium Hydroxide LiOH				140			120			160	C	70	C		C	C	C	C	A	A			A		A		
Lubricating Oil (ASTM #1)			180	C	140	B to 248	73		350	C	180	150	70		A	A	A	A	A	A	A	A	A	A	A	A	A
Lubricating Oil (ASTM #2)			180	C	140		73		350	C	B to 180	C	70-300		A	A	A	A	A	A	A	A	A	A	A	A	A
Lubricating Oil (ASTM #3)			180	C	140		73		350	C	180	C	350		A	A	A	A	A	A	A	A	A	A	A	A	A
Ludox															C	C	C	C	A	A	A		A		A		
Magnesium Carbonate $MgCO_3$		120	180	212	140	B to 212	140		225	B to 300	140	B to 180	212		B	B			B	B	B		B	A	A	A	
Magnesium Chloride $MgCl_2$	Sat'd.	120	180	140	140	B to 140	140		400	230	176	B to 200	185	A	A	A	B	B	C	C	C		C	C	C	C	A
Magnesium Citrate $MgHC_6H_5O_7 \cdot 5H_2O$			180		140		140		300	176	140		212														
Magnesium Oxide MgO		160													A	A				A			A				
Magnesium Sulfate $MgSO_4 \cdot 7H_2O$		160	180	212	140	B to 212	140		300	194	B to 230	B to 200	B to 390	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Maleic Acid HOOCCH=CHCOOH	Sat'd.	160	180	140	140	B to 140	140		250		C	C	140	A	C	C	B	C	C	C	C		C	B	A	B	B
Manganese Sulfate $MnSO_4 \cdot 4H_2O$			180	180	140		140		300	176	B to 200	B to 200	212	A	A	A	A		C	C	B		C		A		
Mercuric Chloride $HgCl_2$			180	180	140		140		300	B to 210	B to 200	160	B to 300	A	C	C	C	C	C	C	C	C	C	C	C	C	C

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Mercuric Cyanide $Hg(CN)_2$	Sat'd.		180	140	140	B to 212	140		300	B to 210	B to 160	B to 70	C		C	C	C	C	C	C	C		C		A		C
Mercuric Sulfate $HgSO_4$	Sat'd.		180	140	140		140		300	70	70	B to 70	C	A	C	C	C	C									C
Mercurous Nitrate $HgNO_3 \bullet {}_2H_2O$	Sat'd.		180	140	140		140		300	100	B to 90	90	C	A	C	C	C	C	C	C	C		C	A	A	A	C
Mercury Hg			180	140	140	B to 248	140		300	210	140	140	185	A	C	C	C	C	A	A	A		A	A	A	A	C
Methane CH_4		C	73	73	140		140		300	C	B	B to 140	B		A	A	A	A	A	A	A	A	A	A	A	A	A
Methanol (Methyl Alcohol) CH_3OH			C	180	140		B to 140		300	B to 176	B to 160	160	C	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Acetate $CH_3CO_2CH_3$		C	C	140	C		C		300	160	C	C	C		B	B			B	B	B		B	B	A		
Methyl Acetone														C	A	A	A	A	A	A	A	A	A	A	A	A	A
Methyl Amine CH_3NH_2			C	C	C				300						C	C			A	A	B		A		A		
Methyl Bromide CH_3Br			C	C	C		C		300	C	C	C	185		C	C	B		C	C	B				B		
Methyl Cellosolve $HOCH_2CH_{20}CH_3$			C	73	C		C			C	C	C	C		A	A	B		B	B	B			A	A	A	
Methyl Chloride CH_3Cl	Dry	C	C	C	C		C		250	C	C	C	C		A	A	C	C	A	A	A	A	A	A	A	A	
Methyl Chloroform CH_3CCl_3		C	C	C	C		C		200	C	C	C	C						A	A			A		A		
Methyl Ethyl Ketone (MEK) $CH_3COC_2H_5$		C	C	73	C			C	200	B to 200	C	C	C	A	A	A	A	A	A	A	A		A	A	A	A	A
Methyl Formate										B to 120	C	C	C		A	A	A		A	A	C		A	A	A	A	
Methyl Isobutyl Ketone $(CH_3)_2CHCH_2COCH_3$		C	C	73	C		73		200	B to 130	C	C	C	A					A						A	A	
Methyl Isopropyl Ketone $CH_3COCH(CH_3)_2$			C		C		73		150	C	C	C	C														
Methyl Methacrylate $CH_2=C(CH_3)COOCH_3$			C		73		140		150	C	C	C	C								C						
Methylene Bromide CH_2Br_2			C	C	C		C		250	C	C	C	C														
Methylene Chloride CH_2Cl_2			C	C	C	C	C	C	250	C	C	C	C		B	B	B		B	B	B				A	A	
Methylene Chlorobromide CH_2ClBr			C		C														A	A					A		
Methylene Iodine CH_2I_2			C	C	C		C		200			C	70														
Methylsulfuric Acid CH_3HSO_4			180	140	140					70	C	70	C														
Milk		160	180	212	140	B to 212	140		400	250	250	250	250		B	B	B	B	C	C	C		C	C	A	A	A

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Mineral Oil		73	180	C	140	B to 212		B to 73	300	C	250	B to 200	B to 400		A	A	A	A	A	A	A	A	A	A	A	A	A
Molasses			180	140	140		140		300	B to 212	200	200	212		A	A	A	A	A	A	A		A	A	A	A	A
Monochloroacetic Acid $CH_2ClCOOH$	50%			140	140		140		200		C	70	C	A	C	C	C	C	C	C	C		C	C	C	C	C
Monochlorobenzene C_6H_5Cl			C	73	C		C		200	C	C	C	C	A	A	A			A	A	A	A	A	A	A	A	
Monoethanolamine $HOCH_2CH_2NH_2$					C				100	120	C	C	C	A			C		B	B	B		B		A		
Morpholine C_4H_8ONH				140			140		200	C	C	C	B to 70		B	B			B	B	B		B	B	B	B	
Motor Oil			180	C	140		B to 140		350	C	190	B to 70	190	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Muriatic Acid	37%								250						C	C	C	C	C	C	C	C	C	C	B	C	C
Naphtha			73	73	140	B to 122			200	C	B to 250	C	B to 400		A	A	B		A	A	A	A	A	A	A	A	
Naphthalene $C_{10}H_8$			C	73	C		73		250	C	C	C	176		A	A	B		A	A	A	A		A	A	A	
Natural Gas		73		73	140		140		300	C	250	140	250		A	A	A	A	A	A	A	A		A	A	A	A
Nickel Ammonium Sulfate									250	70	70	70	B to 70		C	C	C	C	C	C	C				A		
Nickel Chloride $NiCl_2$	Sat'd.	160	180	180	140	B to 212	140		406	176	176	B to 200	B to 400	A	C	C	B		C	C	C				A		
Nickel Nitrate $Ni(NO_3)_2 \cdot {}_6H_2O$	Sat'd.	160	180	180	140	B to 248	140		400	212	B to 200	B to 200	248	A	C	C			C	C	C			A	A	A	
Nickel Sulfate $NiSO_4$	Sat'd.	160	180	180	140	B to 212	140		400	176	176	160	B to 400	A	C	C	B		C	C	C						A
Nicotine $C_{10}H_{14}N_2$			180		140		140				C	C	C											B	A		
Nicotinic Acid C_5H_4NCOOH			180		140	B to 212	140			B to 140	70	B to 200			B	B			C	C	C			B	B	B	A
Nitric Acid HNO_3	<10%	C	180	180	140	B to 212			250	B to 104	C	C	B to 185	A	C	C	C	C	C	C	C	C		B	A	A	C
Nitric Acid HNO_3	30%	C	B to 130	140	140	B to 212			250		C	C	B to 185	C	C	C	C	C	C	C	C		B	A		A	C
Nitric Acid HNO_3	40%	C	B to 120	73	140				250	C	C	C	70	C	C	C	C	C	C	C	C		B	A		A	C
Nitric Acid HNO_3	50%	C	110	C	100				250	C	C	C	70	C	C	C	C	C	C	C	C	C		B	A		C
Nitric Acid HNO_3	70%	C	100	C	73				250	C	C	C	C	C	C	C	C	C	C	C	C	C		C	A		C
Nitric Acid	Fuming								70	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	A		C
Nitrobenzene $C_6H_5NO_2$		C	C	C	C	B to 122	C		400	C	C	C	C	A	B	B			A	A	A				A		

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Nitrogen N_2	Gas								300	B to 350	B to 230	300	B to 400	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Nitroglycerin $CH_2NO_3CHNO_3CH_2NO_3$					C		73	B to 73	70	70	C	70	C		B	B				B	B				A		
Nitrous Acid HNO_2	10%		180	C	140		73		400	100	C	100	C		C	C	C	C	C	C	C			B	B	B	C
Nitrous Oxide N_2O			73	73	73		73	73	400	140	70	B to 80	C	A	B	B			C	B	B				A		
n-Octane C_8H_{18}			C					B to 250	400	C	B to 200	C	B to 400	550	A	A	A	A	A	A	A	A		A	A	A	A
Oleic Acid		160	180	73	140	B to 248	C		250	C	B to 225	C	B to 212	A	B	B	A		B	B	C			B	A	A	A
Oleum (Sulfuric Acid) $xH_2SO_4 \cdot yS0_3$	Fuming	C	C	C	C	C	C			C	C	C	C														
Olive Oil		160	C	73	140	B to 248	B to 68		350	C	250	C	250		A	A	A	A	A	A	A	A	A		A	A	A
Oxalic Acid $HOOCCOOH \cdot {}_2H_2O$	50%	160	180	140	140	B to 122	140		300	300	C	C	B to 400	A	C	C	C		C	C	C	C	C	B	A	A	
Oxygen O_2	Gas	160	180	C	140	B to 212	140		406		C		B to 190	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Ozone O_3			180	C	140		C		300	B	C	C	B	C	A	A	A	A	A	A	A	A	A	A	A	A	A
Palm Oil				73			140		200	C	250	C	250		C	C			C	C	C		C		A		
Palmitic Acid $CH_3(CH_2)_{14}COOH$	10%	73	73	180	140		120		300	C	220	C	400		B	B	B	A	B	B	B		B	B	A	A	A
Palmitic Acid $CH_3(CH_2)_{14}COOH$	70%		73	180	73		120		300	C	220	C	400		B	B	B	A	B	B	B		B	B	A	A	
Parafin $C_{36}H_{74}$		73	180	140	140	B to 212	C		250	C	250	C	400		A	A	A		B	A	A	B	B	A	A	A	A
Peanut Oil			C	140		B to 248			250	C	250	C	400		A	A			A	A			A		A		
n-Pentane $CH_3(CH_2)_3CH_3$		C	C	C	C		C		100	C	250	70	200		A	A	A	A	A	A	A	A	A	A	A	A	A
Peracetic Acid CH_3COOOH	40%	C		73	73			B to 73		C	C	70	C														
Perchloric Acid $HClO_4$	10%					B to 212			250	B to 140	C	140	400	A					C						A		
Perchloric Acid $HClO_4$	70%	73	180	C	73	B to 212	73			B to 140	C	70	400	C					C						B		
Perchloroethylene (Tetrachloroethylene) $Cl_2C=CCl_2$		C	C	C	C	C	C	C	200	C	C	C	400		B	B			B	B	B		B	A	A	A	
Perphosphate			73	140	73				250																		
Phenol C_6H_5OH		C	73	73	73		140	B to 140		C	C	C	B to 210	A	A	A	C		C	C	C		C	A	A	A	

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Phenylhydrazine $C_6H_5NHNH_2$			C	C	C	B to 104	C		B to 70	C	C	C	C														
Phosphate Esters										250	C	C			C	C			C	C			C		A		
Phosphoric Acid H_3PO_4	10%		180	212	140		140		300	B to 300	104	B to 206	B to 400	A	C	C	C	C	C	C	C	C	C	B	A	A	C
Phosphoric Acid H_3PO_4	50%	73	180	212	140	B to 212	140		300	176	B to 104	171	212	A	C	C	C	C	C	C	C	C	C	B	A	A	C
Phosphoric Acid H_3PO_4	85%		180	212	140		73		300	176	C	122	B to 185	A	C	C	C	C	C	C	C	C	C	B	A	B	C
Phosphoric Anhydride P_2O_5			73	73	73					200	B	B	B								C				A		
Phosphorus Pentoxide P_2O_5			73	73	73		140										C				B				A		
Phosphorus Trichloride PCl_3			C	73	C	C	120		300	70	C	C	70	A											A		
Photographic Solutions			180	140	140		140			B to 104	B to 70	B to 140	185							C					A		
Phthalic Acid $C_6H_4(COOH)_2$				140	C		140			B to 100	C	B to 100	C	A	A	A			B	B	C		B		A	A	A
Picric Acid $C_6H_2(NO_2)_3OH$	10%	C	C	73	C	B to 212	73			200	B to 200	70	400		C	C	C	C	C	C	C	C	C	B	A		C
Pine Oil			C	140			B to 73			C	70	C	70		C	C	B		B	B	B		B	A	A	A	
Plating Solutions (Brass)			180	140	140		140		300	70	B	140	140														
Plating Solutions (Cadmium)			180	140	140		140		300	300	B to 180	B to 200	190														
Plating Solutions (Chrome)			180	140	140		140		300	210	C	C	B to 400												A		
Plating Solutions (Copper)			180	140	140		140		300	B to 300	B to 190	B to 160	185														
Plating Solutions (Gold)			180	140	140		140		300	B	B	B	B														
Plating Solutions (Lead)			180	140	140		140		300	B to 300	B to 190	140	185														
Plating Solutions (Nickel)			180	140	140		140		300	B to 300	B	B to 200	185	A		C		C							A		C
Plating Solutions (Rhodium)			180	140	140		140		300	120	B to 200	80	B to 190														
Plating Solutions (Silver)			180	140	140		140		300	B to 300	B to 180	B to 200	B to 190												A		
Plating Solutions (Tin)			180	140	140		140		300	210	B to 180	140	140														
Plating Solutions (Zinc)			180	140	140		140		300	B to 300	B to 180	B	B to 190								B						

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Polysulfide Liquor									300						C	C	C	C	B	B			B		B		C
Polyvinyl Acetate									350	B to 280	80	C	C		B	B	B		A	A	C		A	B	B	B	
Potassium Alum			180		140		140		400	176	B to 180	B to 200	212														
Potassium Aluminum Sulphate			180		140		140		400	176	B to 180	B to 200	212			B		C			C			B	A		B
Potassium Bicarbonate $KHCO_3$	Sat'd.		180	140	140	B to 212	140		400	200	200	200	212								A				A		
Potassium Bichromate $K_2Cr_2O_7$	Sat'd.		180	140	140	B to 212			400	140	140	104	212	A		A		B			B			B	A		
Potassium Bisulfate $KHSO_4$			180	212	140	B to 212	140		400	B	140	70	212	A	B	B	B		C	C	C	C	C		A		
Potassium Bromate $KBrO_3$			180	212	140	B to 212	140		400	212	B to 70	B to 140	212						C	A	A		A		A		
Potassium Bromide KBr			180	212	140	B to 248	140		400	212	200	200	B to 212	A	B	B	B		C	C	C				A		
Potassium Carbonate (Potash) K_2CO_3		73	180	180	140	C	140		400	B	200	200	B to 212	A	B	B	B	B	A	A	A	A	A	A	A	A	B
Potassium Chlorate (Aqueous) $KClO_3$		160	180	212	140	C	140		400	B to 200	70	B to 200	B	C	B	B			A	A	A	A		A	A	A	B
Potassium Chloride KCl		160	180	212	140	B to 212	140		400	B	200	200	212			B	A	A	B	B	B	B	C	B	B	B	A
Potassium Chromate K_2CrO_4			180	212	140		140		400	176	B to 140	140	B to 212	C	A	A	B		B	B	B		B		A	A	
Potassium Cyanide KCN			180	180	140	B to 212	140		400	B	200	200	200		C	C	C	C	B	B	B	B		A	A	A	C
Potassium Dichromate $K_2Cr_2O_7$	Sat'd.		180	180	140		140		400	212	140	120	212	C	B	B	C		B	B	C			A	A	A	
Potassium Ferricyanide $K_3Fe(CN)_6$			180	180	140	B to 248	140		400	70	C	70	B to 212		C	C			B	B	C				A		
Potassium Ferrocyanide $K_4Fe(CN)_6 \cdot 3H_2O$			180	180	140	B to 248	140		400	140	C	70	140		B	B	C	C	C	C	C			B	A		C
Potassium Fluoride KF			180	180	140	B to 212	140		400	200	B to 180	70	212	A											A		
Potassium Hydroxide KOH	25%	160	180	212	140		B to 140	248	300	320	B to 80	B to 212	80	A	C	C	C		B	B	B	B		A	A	A	
Potassium Hypochlorite KClO		160	180		140		120		400	70	C	B to 70	C		C	C					C				A		
Potassium Iodide KI			180	73	73	B to 212	140		400	70		70	B	A	B	B					B	B			A		
Potassium Nitrate KNO_3		160	180	140	140		140		400	B	B to 200	B to 200	212	C	A	A	B	B	B	B	B	B		A	A	A	A

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Potassium Perborate KBO_3			180	140	140		140		400	70	B to 70	70	B to 70	A													
Potassium Perchlorate $KClO_4$			180	140	140		140		200	140	C	70	190														
Potassium Permanganate $KMnO_4$	10%		180	73	140		140		400	210	C	140	B to 212		B	B			A	A	A			A	A	A	
Potassium Permanganate $KMnO_4$	25%		180	73	73	B to 212	140		400	200	C	140	B to 212		B	B			A	A	A			A	A	A	
Potassium Persulfate $K_2S_2O_8$			180	140	140	B to 176	140		400	180	C	B	210														
Potassium Sulfate K_2SO_4		160	180	180	140	B to 212	140		200	176	B to 200	B to 200	212	A	A	A	B	B	A	A	A	A	B	A	A	A	A
Potassium Sulfide K_2S			180	140		68	140		300	70		70	210		C	C	C	C	C	C	C	B		B	B	B	C
Potassium Sulfite $K_2SO_3 \bullet {}_2H_2O$			180	140			140		300	200	B to 150	B to 150	210		B	B	B		C	C	C				A		
Potassium Tetraborate									400					A						A	A		A		A		
Potassium Tripolyphosphate									300					A			B		A		A	A			A		
Propane C_3H_8			73	73	140	B to 248	140		300	C	250	140	250	A	A	A	A	A	A	A	A	A		A	A	A	A
Propargyl Alcohol			C	140	140		140			140	70	70	140														
Propionic Acid $CH_3CH_2CO_2H$		C	C	140		B to 140	140			200		C	C												A		A
Propyl Acetate									140	C	C	C	C					A			A			A	A	A	
Propyl Alcohol $CH_3CH_2CH_2OH$		73	C	140	140	B to 122	B to 140		350	B to 225	180	B to 176	B to 300		A	A	A	A	A	A	A	A		A	A	A	A
n-Propyl Bromide									300						B	B	B		B	B	B				A		
Propylene Glycol	<25%							180	300	200	180	70	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Propylene Glycol	>25%							B to 180	300	200	180	70	250	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Propylene Oxide CH_3CHCH_2O			C	73	C		140		150	C	C	C	C								A				A		
n-Propyl Nitrate									200	C	C	C	C						A	A			A		A		
Pyridine $N(CH)_4CH$			C	C	C	B to 68	73			C	C	C	C		B	B			B	B	B		B	C	B		
Pyrogallic Acid $C_6H_3(OH)_3$					73				150	C	B to 100	C	140		A	A			A	A	A		A	A	A	A	
Pyrrole										C	C	C	C		B	B			B	B	B		B		B		
Quinone $C_6H_4O_2$				140			140			C	C	C	C						A	A			A		A		
Rosin									200	C	B to 200	200	B		C	C			C	C	C		C	A	A	A	

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Salicylic Acid $C_6H_4(OH)(COOH)$				140	140	B to 212	140		300	300	C		300		B	B			C	C	C		C		A		
Selenic Acid H_2SeO_4			180		140		140			70	C	70	C														
Silicic Acid $SiO_2 \cdot nH_2O$			180	140	140	B to 212	140		400	176	176	70	212														
Silicone Oil			180	212	73		73		350	140	212	212	400	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Silver Chloride AgCl		160	180	140	140					70	C	70	90	A	C	C	C	C	C	C	C		C	C	C	C	C
Silver Cyanide AgCN			180	180	140	B to 212	140		350	70	C	70	140		C	C	C	C	C	C	C		C		A to 100		C
Silver Nitrate $AgNO_3$		160	180	180	140		B to 140		350	300	C	B to 200	185	A	C	C	C	C	C	C	C		C	B	A		C
Silver Sulfate Ag_2SO_4		160	180	140	140		140		350	176	140	70	212	A													
Soaps		73	180	140	140		B to 140		400						B	B	A		B	B	B		B	A	A	A	
Sodium Acetate CH_3COONa	Sat'd.		180	212	140	B to 212	140		400	212	C	C	B		A	A	B		B	B	C		B	B	A		
Sodium Aluminate $Na_2Al_2O_4$	Sat'd.				140				300	B to 200	B to 180	140	B to 200		C	C	B		B	B	A		B		A		
Sodium Benzoate C_6H_5COONa			180	140	140		140		300	140	B to 140	B to 70	B to 140														
Sodium Bicarbonate $NaHCO_3$		73	180	212	140	B to 212	140		400	212	B to 200	B to 200	212		A	A	B	B	A	A	C		A	A	A	A	A
Sodium Bichromate	Sat'd.								400	176	140	B to 70	B to 212	C	C	C								A	A	A	
Sodium Bisulfate $NaHSO_4$		73	180	140	140		140			B to 200	B to 200	B to 200	212		C	C	C	C	C	C	C		C	B	A		C
Sodium Bisulfite $NaHSO_3$			180	140	140		140		400	176	160	B to 200	212		B	B			C	C	C		C		A		
Sodium Borate (Borax) $Na_2B_4O_7 \cdot {}_{10}H_2O$	Sat'd.	160	180	180	140		140		300	B to 300	B to 220	B to 200	210	A	A	A			B	B			B	A	A	A	
Sodium Bromide NaBr	Sat'd.	120	180	140	140		140		300	140	C	70	B to 180	A	B	B			C	C	C		C		A		
Sodium Carbonate Na_2CO_3		73	180	212	140	C	140	B to 73	400	176	B to 200	B to 200	212		A	A	B	B	A	A	A	A	A		A	A	C
Sodium Chlorate $NaClO_3$	Sat'd.		180	140	73	C	140		350	B to 200	B to 200	B to 200	B to 200		A	A	C		B	B	B		B	B	A	A	
Sodium Chloride NaCl		120	180	212	140		140		350	B to 212	160	120	212		B	A	A	A	B	B	B	B	C	A	B	B	A
Sodium Chlorite $NaClO_2$	25%		180	73	C		140		200	70	C		B to 140	C													

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Sodium Chromate $Na_2CrO_4 \cdot {}_4H_2O$		120	180	140		B to 176	140			140	140	70	140	C	A	A			B	B	B		B	A	A	A	
Sodium Cyanide NaCN			180	180	140	B to 212	140		350	176	B to 230	140	176	200	275	C	C	C	C	A	A	A	A		A	A	C
Sodium Dichromate $Na_2Cr_2O_7 \cdot {}_2H_2O$	20%		180	180	140		140		300	176	140	C	B to 212	C	C	C	C		B	B	B				A		
Sodium Ferricyanide $Na_3Fe(CN)_6 \cdot {}_2H_2O$	Sat'd.		180	140	140		140		350	300	70	70	140		C	C			C	C					A		
Sodium Ferrocyanide $Na_3Fe(CN)_6 \cdot {}_{10}H_2O$	Sat'd.		180	140	140		140		350	140	80	70	140												A		
Sodium Fluoride NaF		120	180	180	140	B to 212	140		350	140	100	140	140	A	A	A	B		C	C	C				A		
Sodium Hydroxide NaOH	< 5%					B to 68																					
Sodium Hydroxide NaOH	<10%								400	B to 200	212	B to 200	B to 140	A	A		A			A	A		B	A	A	A	
Sodium Hydroxide NaOH	30%	120	180	212	140	C	B to 140		350	B to 130	212	B to 200	80	A	A		B			B	B		B	A	A	A	
Sodium Hydroxide NaOH	50%	120	180	212	140		B to 140	194	350	B to 130	212	B to 200	B to 70	A	B	C	C	C	B	B	B	B	B	A	A	A	B
Sodium Hydroxide NaOH	70%	120	180	212	140		B to 140		350	B to 130	B to 70	B to 200	B to 70	A	C	C	C	C	B	B	B	B	B	A	A	A	B
Sodium Hypochlorite $NaOCl \cdot {}_5H_2O$		120	180	73	73		140	B to 190	350	C	C	C	70		C	C	C	C	C	C	C	C	C	C	C	C	C
Sodium Metaphosphate $(NaPO_3)n$			180	120	140					300	220	150	B to 400	A	C	C	C		C	C	C				A		
Sodium Nitrate $NaNO_3$	Sat'd.	160	180	180	140	B to 212	140		400	200	B to 171	B to 200	212	A	A	A	B	B	A	A	A	A	A	A	A	A	B
Sodium Nitrite $NaNO_2$		160	180	73	140	B to 212	140		400	176	171	B to 140	212		A	A			B	B	B				A		
Sodium Perborate $NaBO_3 \cdot {}_4H_2O$		120	180	73	140		73		350	140	C	B	140	A	C	C			B	B	B			A	A	A	
Sodium Perchlorate $NaClO_4$			180	212	140		140		350	70	C	70	C														
Sodium Peroxide Na_2O_2	10%		180		140		140		250	300	C	C	400	C	C	C	C	C	C	C	C			A	A	A	B
Sodium Phosphate NaH_2PO_4	Acid	120	180	212	140	B to 140	140		400					A	B	B	B	B	B	B	B	A	B	A	A	A	B
Sodium Phosphate NaH_2PO_4	Alkaline		120	180	212		140		400					A	B	B	B	B	B	B	B	A	B	A	A	A	B
Sodium Phosphate NaH_2PO_4	Neutral		120	180	212				400					A	B	B	B	B	B	B	B	A	B	A	A	A	B
Sodium Silicate			180	140	140		140			B to 200	140	B to 200	212		C	C	B		A	A	A		A	A	A	A	

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Sodium Sulfate Na_2SO_4	Sat'd.	160	180	212	140				400	B to 200	200	B to 200	212	A	A	A	B	B	A	A	A	A	A	A	A	A	A
Sodium Sulfide Na_2S	Sat'd.	160	180	212	140		140		350	200	B to 200	B to 200	176		C	C	C	C	B	B	C	B	B	A	A	A	C
Sodium Sulfite Na_2SO_3	Sat'd.	160	180	212	140	B to 212	140	B to 73	350	200	B to 200	B to 200	140		A	A	C		B	B	B		B	B	A	A	
Sodium Thiosulfate $Na_2S_2O_3{\bullet}_5H_2O$			180	180	140		140		350	140		160	140		B	B	C		C	C	C		C		A		
Sour Crude Oil				140	140					C	C	C			C				A	A	A		B	A	A	A	
Soybean Oil				73			140		400	C	250	250	B to 400		A	A	B		A	A	B	A	A	A	A	A	
Stannic Chloride $SnCl_4$	Sat'd.		180	140	140		140		350	300	220	C	B to 400	A	C	C	C	C	C	C	C	C	C	C	C	C	C
Stannous Chloride $SnCl_2$	15%	120	180	140	140		140		350	B to 210	B to 150	B to 140	B to 185	A	C	C	C	C	C	C	C	C	C		A		
Starch			180	140	140		140		300	176	B to 176	212	212		B	B	B	B	B	B	B		B	A	A	A	
Steam (Low Pressure)									400					A	A	A	A	A	A	A	A	A	A	A	A	A	A
Steam (Medium Pressure)									400						A	A	A	A	A	A	A	A	A	A	A	A	A
Steam (High Pressure)									C						C	C	C	C	C	B	A	C	B	A	A	A	C
Stearic Acid $CH_3(CH_2)_{16}COOH$			180	73	140		120		350	C	B to 70	C	140	A	A	A	C	B	C	C	C	B	C	A	A	A	A
Stoddard's Solvent			C		C		73			C	250	C	250		A	A			A	A	A		A		A	A	
Styrene $C_6H_5CH{=}CH_2$				73			C		350	C	C	C	C		B	B	B		B	B	B		B		A		
Succinic Acid $COOH(CH_2)_2COOH$			180	140	140		140		200	140	70	B to 70	B to 176		A	A			A	A	A		A	A	A	A	
Sugar $C_6H_{12}O_6$			180		140		140		350						C	C				B	C		B	A	A	A	
Sulfamic Acid HSO_3NH_2	20%		C	180	C					70	C	B to 150	C		B	B	B		C	C	C		C		A		A
Sulfate Liquors (Oil)	6%		180	140	140				200	B to 250	B to 150	B to 150	170		C	C	C	C	B	A			A		A		C
Sulfite Liquors	6%	73	180		140				350	B	C	B to 70	140								C	B			A		
Sulfur S			180	212	140				350	250	C	70	266	A	C	C	C	C	B	B	C	B	B	B	A		C
Sulfur Chloride S_2Cl_2				C					350	C	C	C	140	A	C	C	C	C	C	C	C	C	C	C	C	C	C
Sulfur Dioxide SO_2	Gas (Dry)	C	73	140	140		140		350	160	C	C	B to 250	A	A	B	A	A	A	A	A		A	A	A	A	A
Sulfur Dioxide SO_2	Gas (Wet)	C	C	140	73		120			140	C	C	B to 140	A	C	B	B	C						C	A	C	C

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Sulfur Trioxide SO_3	Gas		C		73		C			B to 120	C	C	B	C	C			C						C	B	B	C
Sulfuric Acid H_2SO_4	<30%	120	180	180	140	B to 248	B to 140	B to 73	250	212	B	158	248	A	C	C	C	C	C	C	C	C	C	C	A	B	C
Sulfuric Acid H_2SO_4	50%	73	180	140	140	B to 212	B to 140	212	250	212	C	158	212	A	C	C	C	C	C	C	C	C	C	C	A	C	C
Sulfuric Acid H_2SO_4	70%	C	180	73	140				200	140	C	C	180	212	C	C	C	C	C	C	C	C	C	C	B	C	C
Sulfuric Acid H_2SO_4	90%	C	150	73	73	B to 212			200	70	C	C	158	212	C	C	C	C	C	C	C	C	C	C	C	C	C
Sulfuric Acid H_2SO_4	100%	C	C	C	C				200	C	C	C	158	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Sulfurous Acid H_2SO_3	Sat'd.		180	140	140	B to 212	140		350	C	C	C	C	A	C	C	C	C	C	C	C	C	C	B	A	A	C
Tall Oil			C	180	140		120		250	C	200	C	200		B	B	B		B	B	B		B	A	A	A	
Tannic Acid $C_{76}H_{52}O_{46}$	10%	C	180	73	140	B to 212	140		250	200	200	B to 200	200		A	A			B	B	C	B	B	B	A	A	
Tanning Liquors		160	180	73	140		120			200	B to 200	70	200		A	A			B						A		
Tar			C		C				250	C	C	C	B		A	A	A	A	A	A	A	A	A	A	A	A	A
Tartaric Acid $HOOC(CHOH)_2COOH$		160	180	140	140	B to 248	140		250	C	200	158	B to 200	A	A	A	C	C	C	C	C	C	C	A	A	A	B
Tetrachloroethane $CHCl_2CHCl_2$				C	C		C	C	400	C	C	C	200												A		
Tetrachloroethylene $Cl_2C=CCl_2$		C	C	C	C		C		350	C	C	C	212														
Tetraethyl Lead $Pb(C_2H_5)_4$			73	73	73				350	C	C	C	120		A	A				B	B		A				
Tetrahydrofuran C_4H_8O		C	C	C	C		C	C		C	C	C	C														
Thionyl Chloride $SOCl_2$			C	C	C	C	C	C		C	C	C	C	A													
Thread Cutting Oils			73	73	73			73	350						A				A	A	A			A	A	A	
Titanium Tetrachloride $TiCl_4$				140	C		120			C	C	C	160	A	C	C					C				B		
Toluene (Toluol) $CH_3C_6H_5$		C	C	C	C		C	C	200	C	C	C	B to 200		A	A	A	A	A	A	A	A		A	A	A	A
Tomato Juice			180	212	140		140		350	70	140	140	140		B				C	C	B				A	A	
Transformer Oil			180	73	140		C		300	C	B	C	300	A	A					A	A				A	A	
Transformer Oil DTE/30			180		140		B to 120		300					A	A					A	A				A	A	
Tributyl Phosphate $(C_4H_9)_3PO_4$			C	C	C		73		300	250	C	C	C		B	B	B		A	A	A			B	A		
Trichloroacetic Acid CCl_3COOH	50%			140	140	B to 104	140		200	C	C	C	C	A	B	C			C	C	C			C	B		

CHEMICAL RESISTANCE CHART

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Trichloroethylene $CHCl{=}CCl_2$		C	C	C	C	B to 176	C	C	200	C	C	C	200	A	A	A	A	A	B	B	B			A	A	A	A
Triethanolamine $(HOCH_2CH_2)_3N$		C	73	140	73	C	73	B to 190		B	C	B	C		C	C			C	C	C	C		C	A		
Triethylamine $(C_2H_5)_3N$				C	140		73	B to 73		160	140	B to 70	C			A	A										
Trimethylpropane $(CH_2OH)_3C_3H_5$				140	73		C			C	C	C	70														
Trisodium Phosphate $Na_3PO_4{\bullet}_{12}H_2O$		73	180	140	140		140		350	212	C	C	B to 300	A	C	C			B	B		A			A	A	
Tung Oil										C	250	B to 120	250		B	B	B		B	B	B			B	A	A	
Turpentine		C	C	C	140		C			C	250	C	B to 200		A	A	A	A	A	A	A	A		A	A	A	A
Urea $CO(NH_2)_2$			180	180	140		140									B	B			C	C	C				A	C
Urine		160	180	180	140		140		400	140	140	C	140						C	C	C			A	A	A	
Varnish									350	C	C	C	B to 400		A	A	B	B	C	C	C			B	A	A	A
Vaseline (Petroleum Jelly)			C	140	C		120		300	C	140	140	140						A	A	A			A	A	A	
Vegetable Oil			C	140	140	B to 248	B to 140		300	C	200	C	200		A	A				A	A			A	A	A	
Vinegar		73	150	140	140		140		300	B to 210	C	C	200		C	C	C	C	C	C	C			A	A	A	B
Vinyl Acetate $CH_3COOCH{=}CH_2$			C	73	C	C	140		350	C	C	C	C		B	B		B	B	B				A		A	
Water (Acid Mine) H_2O		160	180	140	140		140		400	200	B to 210	C	B to 190	A	C	C	C	C	C	C	C	C	C	A	A	A	C
Water (Deionized) H_2O		160	180	140	140		140		400	B to 140	B to 200	B to 150	B to 200	A	B	B	C	C	C	C	C		C	B	A	A	A
Water (Distilled) H_2O		160	180	212	140	B to 248	140		400	140	B to 210		250	A	A	A	B	B	C	C	C	B	C	A	A	A	A
Water (Potable) H_2O		160	180	212	140	B to 248	140		400					A	A	A	A	A	B	B	B	A	B	A	A	A	A
Water (Salt) H_2O		160	180	212	140		140		400	B to 250	B to 210	140	B to 200	A	B	B	B	C	C	C	C	B	C	B	A	A	B
Water (Sea) H_2O		160	180	212	140	B to 248	140		400	B to 250	B to 210	B to 140	212	A	B	B	B	C	C	C	C	B	C	B	B	A	B
Water (Soft) H_2O		160	180	212	140		140		400					A	A	A	A	B	C	C	B	B	C	A	A	A	A
Water (Waste) H_2O		73	180	212	140		140		400					A	B	B	B	B	B	B	B	B	B	B	A		B

CHEMICALS AND FORMULA	CONCENTRATION	PLASTICS MAX TEMPERATURE (°F)							SEAL MATERIALS MAX TEMPERATURE (°F)						METAL												
		ABS	CPVC	PP	PVC	PVDF	PEX	PPSU	PTFE	EPDM	NITRILE (BUNA-N)	POLYCHLORO-PRENE	FKM	GRAPHITE	BRONZE (85% CU)	SILICON BRONZE	ALUMINUM BRONZE	BRASS	GRAY IRON	DUCTILE IRON	CARBON STEEL	3% NI/IRON	NI PLATED DUCTILE	400 SERIES SS	316 SS	630 SS	COPPER
Whiskey			180	140	140	B to 212	140		350	200	200	140	B		C	C	B		C	C	C		C	B	A		A
White Liquor		73	180		140					300	104	140	190		C	C	C		C	C	C		C		A		
Wine		73	180	140	140	B to 248	140		350	200	200	140	200		C	C			C	C	C		C	B	A		
Xylene (Xylol) $C_6H_4(CH_3)_2$		C	C	C	C	C	C	C	350	C	C	C	B to 200	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Zinc Acetate $Zn(CH_3COO)_2 \cdot 2H_2O$			180							140	C	C	C		C	C	C	C	C	C	C		C		A		
Zinc Carbonate $ZnCO_3$			180	140		B to 212	140			70	70	70	70		B	B									B		
Zinc Chloride $ZnCl_2$		120	180	180	140		140		400	210	B to 200	194	212	A	C	C	C		C	C	C		C	C	B	B	
Zinc Nitrate $Zn(NO_3)_2 \cdot 6H_2O$		160	180	180	140		140			180	140	100	190	A											A	A	
Zinc Sulfate $ZnSO_4 \cdot 7H_2O$		160	180	212	140		140		400	B to 300	B to 220	171	B	A	C	C	B		C	C	C	B	C	A	A	A	A

The data set forth herein is provided "as is". NIBCO INC., its distributors and the authors of and contributors to this publication specifically deny any warranty or representation, expressed or implied, for the accuracy and/or reliability of the fitness for any particular use of information contained herein or that any data is free from errors.

NIBCO, its distributors and the authors of and contributors hereto do not assume any liability of any kind whatsoever for the accuracy or completeness of such information. Moreover, there is a need to reduce human exposure to many materials to the lowest practical limits in view of possible long-term adverse effects. To the extent that any hazards may have been mentioned in this publication, we neither suggest nor guarantee that such hazards are the only ones which may exist. Final determination of the suitability of any information or product for the use to be contemplated by the user, the manner of that use, and whether there is any infringement of patents is the sole responsibility of the user. The successful use or operation of valves, fittings or pipe depends on many factors, not just the chemical resistance of their materials. We recommend that anyone intending to rely on any data, information or recommendation or to use any equipment, processing technique or material mentioned in this publication should satisfy himself as to such suitability and that he meets all applicable safety and health standards. We strongly recommend that users seek and adhere to manufacturer's or supplier's current instructions for handling each material they use.