

**CHEMICAL RESISTANCE TABLE**

The following table gives qualitative information as to the resistance of PVDF (polyvinylidene fluoride), PP (polypropylene), and HDPE (high density polypropylene) to specific chemicals under various conditions. The values given correspond to the most accurate information available from raw materials suppliers of the specific resins, based upon testing results and other relevant literature.

It should be emphasized that this data has been compiled for initial consultation purposes. The information is in no way intended to replace testing based on actual conditions. Also, the user should contact a competent corrosion expert (certified by NACE or with sufficient experience in these materials) to verify any recommendation or to interpret the tables. Furthermore, any special or unusual factors, including the length of time or level of stress in the system, should be taken into consideration. In all circumstances, the Engineering Department of Asahi/America, Inc. should be consulted to review and verify final recommendations.

The following symbols are used in the table:

- RESISTANT SYMBOL**  
On the basis of the data, little or no effect on the material has been evident within the given range of pressure and temperature limits.
- CONDITIONALLY RESISTANT SYMBOL**  
Suitability has to be checked in each individual case. Further testing may have to be performed to offer a specific recommendation. Please consult with the Engineering Department of Asahi/America for a specific recommendation.
- 0 NON-RESISTANT SYMBOL**  
The material is generally regarded to be unsuitable. Therefore, the application is not recommended.

The following abbreviations are used for concentrations in some cases where a specific numeric value is not given.

- VL — aqueous solution, percentage of mass less than 10%
- L — aqueous solution, percentage of mass higher than 10%
- GL — aqueous solution, saturated at 68° F (20° C)
- TR — minimum technically pure concentration
- H — commercially available concentration

The following footnotes are used in the body of the table:

1. Penetration of HCl possible
2. Oxidizing
3. Penetration of HF possible
4. Medium might cause stress cracking
5. Penetration of HBr possible



**Precautionary Note:**  
Mixed use applications in recirculating **domestic hot water systems**, may contain copper components that are used in hot water heaters, distribution headers, plumbing connections, and other equipment. Careful design is important and proper installation in accordance to the Copper Development Association- CDA Publication A4015-14/16 “*The Copper Tube Handbook*”, will eliminate conditions that could cause copper erosion and corrosion, which can have negative effects on thermoplastic piping systems. Further information can be found in the Plastic Pipe Institute’s Technical Note- TN57;  
**PPI TN-57/2018: Proper Integration of Copper Tubing and Components with PP-R Piping Materials for**

**Plumbing Applications**

<https://plasticpipe.org/pdf/tn-57.pdf>

Note: Hydronic and other hot water heating systems are typically not affected by copper erosion due to the lower flow velocities, lower dissolved oxygen, and oxidant levels. The presence of oxidants and oxygen, in extreme hot water is typically found only in domestic (potable) water applications.

### **Disclaimer**

Asahi/America, Inc. provides this guide to assist engineers in the design of systems, installers in the installation and owners in the operation. This guide is designed to provide the best possible recommendations known at the time of printing. Each and every type of piping system is different and no one recommendation can cover all conditions. This guide is made available to assist in the design and installation, but in no way should be construed as a written recommendation on any system. Each system should be individually designed and installed based on the responsibility and decisions of the purchaser. This guide is not a substitute for contacting Asahi/America for specific recommendations on a system. In addition, Asahi/America is not responsible for items not appearing in the guide or recommendations that may have changed after the printing of this guide. It is recommended in each case to consult Asahi/America for specific recommendations on each system.

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Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Acetaldehyde	40	PVDF	0					
		PP	————					
		HDPE	————					
	100	PVDF	0					
		PP	••••					
		HDPE	••••					
Acetaldehyde and Acetic acid	90/10	PVDF	0					
		PP	••••					
		HDPE	••••					
Acetic acid aqueous	10	PVDF	————					
		PP	————					
		HDPE	————					
Acetic acid aqueous (glacial acetic acid)	min 96	PVDF	————	••••••				
		PP	————	••••••				
		HDPE	————	••••••				
Acetic acid-ethyl ester (ethyl acetate)	TR	PVDF	••••••					
		PP	••••••					
		HDPE	••••••					
Acetic acid-methyl ester (methyl acetate)	TR	PVDF	————					
		PP	————					
		HDPE	————					
Acetic anhydrid	TR	PVDF	0					
		PP	————	••••••				
		HDPE	————	••••				
Acetone	GL	PVDF	0					
		PP	————					
		HDPE	————					
Acetophenone	100	PVDF	0					
		PP	————					
		HDPE	————					
	TR	PVDF	————					
		PP	————	••••••				
		HDPE	————					
Acrylic acid ethylic ester	100	PVDF	••••					
		PP	————					
		HDPE	————					
Acrylonitrile	TR	PVDF	••••					
		PP	————	••••				
		HDPE	————					
Adipic acid aqueous	GL	PVDF	————					
		PP	————					
		HDPE	————					
Air*	TR	PVDF	————					
		PP	————					
		HDPE	————					
Allyl alcohol (2-propen-1-ol)	96	PVDF	————					
		PP	————					
		HDPE	————					
Aluminium chloride	GL	PVDF	————					
		PP	————					
		HDPE	————					
Aluminium fluoride	GL	PVDF	————					
		PP	————					
		HDPE	————					
Aluminium sulphate	GL	PVDF	————					
		PP	————					
		HDPE	————					
Alums (metal(I)-and metal (III)-sulphates)	GL	PVDF	————					
		PP	————					
		HDPE	————					

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Ammonia gas	TR	PVDF	————	••••••••				
		PP	————					
		HDPE	————					
Ammonia liquid	TR	PVDF	0					
		PP	————					
		HDPE	————					
Ammonia solution aqueous (ammonia water)	33	PVDF	0					
		PP	————					
		HDPE	————					
Ammonia aluminium sulphate (ammonia alum)	L	PVDF	————					
		PP	————					
		HDPE	————					
Ammonia carbonate and ammonium hydrogen carbonate	GL	PVDF	————					
		PP	————					
		HDPE	————					
Ammonium chloride	GL	PVDF	————					
		PP	————					
		HDPE	————					
Ammonium iron (III) sulphate (iron alum)	L	PVDF	————					
		PP	————					
		HDPE	————					
Ammonium fluoride	L	PVDF	————					
		PP	————					
		HDPE	————					
Ammonium nitrate	GL	PVDF	————					
		PP	————					
		HDPE	————					
Ammonium phosphate	GL	PVDF	————					
		PP	————					
		HDPE	————					
Ammonium sulphide	L	PVDF	————					
		PP	————					
		HDPE	————					
Ammonium sulphate	GL	PVDF	————					
		PP	————					
		HDPE	————					
Amyl acetate	TR	PVDF	————					
		PP	••••					
		HDPE	————	••••				
Aniline hydrochloride aqueous	GL	PVDF	————					
		PP	————					
		HDPE	————					
Aniline pure	TR	PVDF	————					
		PP	••••••••					
		HDPE	————					
Anone	TR	PVDF	————					
		PP	••••••••					
		HDPE	————	••••				
Anthraquinone sulphone acid	GL	PVDF	————					
		PP	————					
		HDPE	————	••••••				
Anti-freezers (motor vehicles)	H	PVDF	————					
		PP	————					
		HDPE	————					
Antimony chloride aqueous	90	PVDF	————					
		PP	————					
		HDPE	————					
Aqua regia (HCl/HNO2)	75/25	PVDF	••••					
		PP	0					
		HDPE	0					

\* Compressed air is not recommended for any system except Air-Pro.

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Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Arsenic acid aqueous	80	PVDF						
		PP				••••••••		
		HDPE						
Barium carbonate	GL	PVDF						
		PP						
		HDPE						
Barium chloride	GL	PVDF						
		PP						
		HDPE						
Barium hydroxide	GL	PVDF	0					
		PP						
		HDPE						
Barium salts	GL	PVDF						
		PP						
		HDPE						
Barium sulphate	GL	PVDF						
		PP						
		HDPE						
Beater glue	H	PVDF						
		PP						
		HDPE						
Beer	H	PVDF						
		PP						
		HDPE						
Beer dye (sugar dye)	VL	PVDF						
		PP						
		HDPE						
Bees-wax	H	PVDF						
		PP		••••••••				
		HDPE			••••			
Benzaldehyde	GL	PVDF		••••••••••				
		PP						
		HDPE				••••		
Benzene	TR	PVDF		••••••••				
		PP	••••					
		HDPE	••••					
Benzene	H	PVDF						
		PP	••••					
		HDPE		••••••••				
Benzene - benzole mixture	80/20	PVDF						
		PP	••••					
		HDPE		••••••••				
Benzoic acid	GL	PVDF						
		PP						
		HDPE						
Benzoyl chloride	TR	PVDF		••••••••				
		PP	••••					
		HDPE	••••••••••					
Benzyl alcohol	TR	PVDF			••••••••			
		PP			••••••••			
		HDPE			••••			
Bisulphite lye containing SO <sub>2</sub>	GL	PVDF						
		PP						
		HDPE						
Bleaching solution (sodium hypochloride)	20	PVDF	••••••••••					
		PP	••••••~••••					
		HDPE	••••					
Boric acid aqueous	GL	PVDF						
		PP						
		HDPE						

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Borax, aqueous (sodium tetraborate)	GL	PVDF						
		PP						
		HDPE						
Bromine liquid	TR	PVDF						
		PP	0					
		HDPE	0					
Bromine fumes	TR	PVDF						
		PP	0					
		HDPE	0					
Bromine <sup>5</sup> (bromine water)	GL	PVDF						
		PP	••••					
		HDPE						
Butadiene gas	TR	PVDF						
		PP	••••					
		HDPE	••••					
Butane gas	TR	PVDF						
		PP						
		HDPE						
Butanediol aqueous	L	PVDF						
		PP						
		HDPE						
Butanediol	TR	PVDF						
		PP						
		HDPE						
Butanol (butyl alcohol)	TR	PVDF					••••	
		PP						
		HDPE						
1,2,4-Butanetriol	TR	PVDF						
		PP						
		HDPE						
2-Butene-1,4-diol	TR	PVDF						
		PP						
		HDPE						
Butindiol	TR	PVDF						
		PP						
		HDPE						
Butyric acid (and isobutyric acid)	TR	PVDF	••••••••••					
		PP						
		HDPE		••••				
Butylacetate	TR	PVDF						
		PP	••••					
		HDPE	••••					
Butylene liquid	TR	PVDF						
		PP	••••					
		HDPE						
Butylene glycol (1,4-butanediol) aqueous	TR	PVDF						
		PP		••••••••				
		HDPE						
Butylene glycol (ethylene glycol monobutyl ether)	TR	PVDF						
		PP						
		HDPE						
Butylphenol	GL	PVDF						
		PP						
		HDPE						
Butylphenone	GL	PVDF						
		PP						
		HDPE	0					
Butylphthalate (dibutylphthalate)	TR	PVDF						
		PP		••••••~••••				
		HDPE		••••••••				

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Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Calcium carbonate	GL	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Calcium chlorate	GL	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Calcium chloride aqueous	GL	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Calcium hydroxide	GL	PVDF	•••••	•••••	•••••	•••••	•••••	•••••
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Calcium hypochlorite (chloride of lime), aqueous	L	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Calcium nitrate aqueous	GL	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Calcium sulphate	GL	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Calcium sulphide	VL	PVDF	_____	_____	_____	_____	_____	_____
		PP	•••••	•••••	•••••	•••••	•••••	•••••
		HDPE	•••••	•••••	•••••	•••••	•••••	•••••
Camphoric oil (Camphor oil)	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	0	_____	_____	_____	_____	_____
		HDPE	0	_____	_____	_____	_____	_____
Carbolineum	H	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Carbon monoxide gas	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Carbonic disulphide	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	0	_____	_____	_____	_____	_____
		HDPE	•••••	_____	_____	_____	_____	_____
Carbon dioxide gas	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Carbonic acid aqueous	GL	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Carbonic acid dry	H	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Carbonic acid wet	H	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Castor oil	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Caustic Lye aqueous	50	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Caustic lye aqueous	L	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Caustic soda (sodium hydroxide)	60	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Chloroacetic acid (mono), aqueous	L	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chloroacetic acid (mono), aqueous	85	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chloral (trichloroacetaldehyde)	TR	PVDF	•••••	•••••	•••••	•••••	•••••	•••••
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chloral hydrate	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	•••••	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chloramine aqueous	L	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chlorodiphenyl	H	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chloroethane (ethyl chloride)	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	0	_____	_____	_____	_____	_____
		HDPE	•••••	_____	_____	_____	_____	_____
2-Chlorethanol (ethylenechlorohydrin)	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chloric acid aqueous	1	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	•••••	•••••	•••••	•••••	•••••
		HDPE	_____	_____	_____	_____	_____	_____
	10	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	•••••	•••••	•••••	•••••	•••••
		HDPE	_____	_____	_____	_____	_____	_____
20	PVDF	_____	_____	_____	_____	_____	_____	
	PP	_____	_____	_____	_____	_____	_____	
	HDPE	_____	_____	_____	_____	_____	_____	
Chloride or lime (slurry in water)	any	PVDF	_____	_____	_____	_____	_____	_____
		PP	_____	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chlorine liquid	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	0	_____	_____	_____	_____	_____
		HDPE	0	_____	_____	_____	_____	_____
Chlorine gas, wet	0.5	PVDF	•••••	•••••	•••••	•••••	•••••	•••••
		PP	•••••	_____	_____	_____	_____	_____
		HDPE	•••••	_____	_____	_____	_____	_____
	1	PVDF	•••••	•••••	•••••	•••••	•••••	•••••
		PP	0	_____	_____	_____	_____	_____
		HDPE	0	_____	_____	_____	_____	_____
Chlorine gas, dry	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	0	_____	_____	_____	_____	_____
		HDPE	•••••	_____	_____	_____	_____	_____
Chlorine water (chlorine)	GL	PVDF	_____	_____	_____	_____	_____	_____
		PP	•••••	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chlormethyl	100	PVDF	_____	_____	_____	_____	_____	_____
		PP	0	_____	_____	_____	_____	_____
		HDPE	_____	_____	_____	_____	_____	_____
Chlorobenzene	TR	PVDF	_____	•••••	•••••	•••••	•••••	•••••
		PP	•••••	_____	_____	_____	_____	_____
		HDPE	•••••	_____	_____	_____	_____	_____
Chloroform (trichloromethane)	TR	PVDF	_____	_____	_____	_____	_____	_____
		PP	•••••	_____	_____	_____	_____	_____
		HDPE	•••••	_____	_____	_____	_____	_____

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Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Chloromethane (methylchloride gas)	TR	PVDF	—					
		PP	—					
		HDPE	••••					
Chlorosulphonic acid	TR	PVDF						
		PP	0					
		HDPE	0					
Chrome alum aqueous	GL	PVDF	—					
		PP	—					
		HDPE	—					
Chrome acid <sup>4)</sup> (chrome (VI)-oxide <sup>4)</sup> aqueous	20	PVDF	—					
		PP	—••••••••					
		HDPE	—••••					
	40	PVDF	—					
		PP	—••••••••					
		HDPE	••••					
Chromosulphuric acid Chromic acid/sulphuric acid	15/35/50	PVDF	—					
		PP	0					
		HDPE	0					
Citric acid	GL	PVDF	—					
		PP	—					
		HDPE	—					
Citric acid aqueous	VL	PVDF	—					
		PP	—					
		HDPE	—					
Coconut butter alcohol	TR	PVDF	—					
		PP	—••••••••					
		HDPE	—••••••••					
Common salt aqueous	VL	PVDF	—					
		PP	—					
		HDPE	—					
Common salt (natrium chloride)	GL	PVDF	—					
		PP	—					
		HDPE	—					
Copper (II)-chloride	GL	PVDF	—					
		PP	—					
		HDPE	—					
Copper (II)-cyanide	GL	PVDF	—					
		PP	—					
		HDPE	—					
Copper fluoride aqueous	GL	PVDF	—					
		PP	—					
		HDPE	—					
Copper (II)-nitrate aqueous	30	PVDF	—					
		PP	—					
		HDPE	—					
Copper (II)-nitrate	GL	PVDF	—					
		PP	—					
		HDPE	—					
Copper (II)-sulphate	GL	PVDF	—					
		PP	—					
		HDPE	—					
Copper sulphate aqueous	GL	PVDF	—					
		PP	—					
		HDPE	—					
Cotton seed oil	TR	PVDF	—					
		PP	—					
		HDPE	—					
Cresol aqueous	<90	PVDF	—					
		PP	—					
		HDPE	—					

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Cresol aqueous	≥90	PVDF	—					
		PP	—					
		HDPE	—••••••••					
Crotonaldehyde	TR	PVDF	—					
		PP	—					
		HDPE	—					
Cyanide of potassium (potassium cyanide)	L	PVDF	—					
		PP	—					
		HDPE	—					
Cyanide of potassium aqueous	GL	PVDF	—					
		PP	—					
		HDPE	—					
Cyclohexanol	TR	PVDF	—					
		PP	—					
		HDPE	—					
Cyclohexanone	TR	PVDF	—					
		PP	—••••••••					
		HDPE	—••••••••					
Cyclohexane	TR	PVDF	—					
		PP	—					
		HDPE	—					
Decalin® (decahydro-naphthaline)	TR	PVDF	—					
		PP	••••					
		HDPE	—••••••••					
Detergents	H	PVDF	—					
		PP	—					
		HDPE	—					
Dextrine aqueous	L	PVDF	—					
		PP	—					
		HDPE	—					
Dextrose (starch sugar glucose)	20	PVDF	—					
		PP	—					
		HDPE	—					
1,2-Diaminoethane (ethylene diamine)	TR	PVDF	—					
		PP	—					
		HDPE	—					
Dibutyl phthalate	TR	PVDF	—					
		PP	—••••••••					
		HDPE	—••••~••••					
Dichloroethane (vinylidene dichloride and vinylene dichloride)	TR	PVDF	—					
		PP	0					
		HDPE	0					
Dichloroethylene (11 and 12)	TR	PVDF	—					
		PP	0					
		HDPE	—					
Dichloroacetic acid aqueous	50	PVDF	—					
		PP	—					
		HDPE	—					
Dichloroacetic acid aqueous	TR	PVDF	—					
		PP	—••••••~••••					
		HDPE	—					
Dichloroacetic acid methyl ester	TR	PVDF	—					
		PP	—••••~••••					
		HDPE	—					
Dichlorobenzene	TR	PVDF	—					
		PP	••••					
		HDPE	••••					
Diesel fuel	H	PVDF	—					
		PP	—					
		HDPE	—••••~••••					

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# CHEMICAL RESISTANCE

# CHEMICAL RESISTANCE TABLE

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Diethanolamine	TR	PVDF						
		PP	=====					
		HDPE	=====					
Diethyl ether (ethyl ether)	TR	PVDF						
		PP	.....					
		HDPE	.....					
Diglycolic acid aqueous	GL	PVDF						
		PP	=====					
		HDPE	=====					
Dibexylphthalate	TR	PVDF						
		PP	=====					
		HDPE						
Diisobutyl ketone (2,6-dimethyl-4-heptanone)	TR	PVDF	=====	.....				
		PP	=====					
		HDPE	=====					
Diisooctyl phthalate	TR	PVDF						
		PP	=====	.....				
		HDPE	=====	.....				
Diisopropyl ether	TR	PVDF						
		PP	.....					
		HDPE	=====	.....				
Dimethylamine gas	100	PVDF						
		PP	=====					
		HDPE	=====	.....				
Di-n-Butylether	TR	PVDF						
		PP	.....					
		HDPE	.....					
Dinonylphthalate ( DNP)	TR	PVDF						
		PP	=====	.....				
		HDPE	=====	.....				
Diocetylphthalate (DOP)	TR	PVDF						
		PP	=====	.....				
		HDPE	=====	.....				
1,4-Dioxan (diethylene dioxide)	TR	PVDF	.....					
		PP	.....					
		HDPE	=====					
Emulsions photographic	H	PVDF						
		PP	=====					
		HDPE	=====					
Enzyme mash	H	PVDF						
		PP	=====					
		HDPE	=====					
Ester	40	PVDF						
		PP	.....					
		HDPE	.....					
Ethanol (ethyl alcohol)	TR	PVDF	=====	.....				
		PP	=====					
		HDPE	=====					
Ethyl acetate	100	PVDF						
		PP	=====	.....				
		HDPE	=====	.....				
Ethyl alcohol aqueous	96	PVDF						
		PP	=====					
		HDPE	=====					
Ethyl alcohol + acetic acid (enzyme compound)	H	PVDF						
		PP	=====					
		HDPE	=====					
Ethyl alcohol (enzyme mash)	H	PVDF						
		PP	=====					
		HDPE	=====					

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Ethyl alcohol methylated with Toluol 2%	96	PVDF						
		PP	=====					
		HDPE	=====					
Ethyl benzene	TR	PVDF	.....					
		PP	.....					
		HDPE	.....					
Ethyl chloride gas (chloroethane)	TR	PVDF						
		PP	0					
		HDPE	0					
Ethylenechlorohydrin (chloroethanol)	TR	PVDF	=====					
		PP	=====					
		HDPE	=====					
Ethylenediamine (1,2-diaminoethane)	TR	PVDF	.....					
		PP	=====					
		HDPE	=====					
Ethylene glycol (1,2-ethanediol)	TR	PVDF	=====					
		PP	=====					
		HDPE	=====					
Ethylene oxide gas (oxiran)	TR	PVDF						
		PP	0					
		HDPE	=====					
Ethyl ether .	100	PVDF						
		PP	.....					
		HDPE	.....					
Exhaust gases containing SO <sub>2</sub>	VL	PVDF	=====					
		PP	=====					
		HDPE	=====					
Exhaust gases containing carbon dioxide	any	PVDF	=====					
		PP	=====					
		HDPE	=====					
Exhaust gases containing hydrochloric acid <sup>1)</sup>	any	PVDF	=====					
		PP	=====					
		HDPE	=====					
Exhaust gases containing hydrogen fluoride	VL	PVDF	=====					
		PP	=====					
		HDPE	=====					
Exhaust gases containing nitrogen	VL	PVDF	=====					
		PP	=====					
		HDPE	=====					
Exhaust gases containing oleum	VL	PVDF	0					
		PP	0					
		HDPE	0					
Exhaust gases sulphuric acid wet	any	PVDF	=====					
		PP	=====					
		HDPE	=====					
Fatty acids	100	PVDF						
		PP	.....					
		HDPE	=====	.....				
Fertilizer salt	H	PVDF						
		PP	=====					
		HDPE	=====					
Fixing solutions photographic	H	PVDF						
		PP	=====					
		HDPE	=====					
Fluor gas, dry	TR	PVDF						
		PP	0					
		HDPE	0					
Fluorammonium aqueous	20	PVDF						
		PP	=====					
		HDPE	=====					

# CHEMICAL RESISTANCE TABLE

# CHEMICAL RESISTANCE

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Fluosilicic acid aqueous	32	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
	40	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Formaldehyde aqueous	40	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Formic acid aqueous	85	PVDF	—	—	—	—	—	—
		PP	•••••	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Fructose	L	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Fruit juices, pulp	H	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Fruit pulp	H	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Fuel oil	H	PVDF	—	—	—	—	—	—
		PP	•••••	—	—	—	—	—
		HDPE	•••••	—	—	—	—	—
Furfuryl alcohol	TR	PVDF	—	—	—	—	—	—
		PP	•••••	—	—	—	—	—
		HDPE	••••	—	—	—	—	—
Gaswater	H	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Gelatine	L	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Glacial acetic acid	100	PVDF	—	—	—	—	—	—
		PP	•••••	—	—	—	—	—
		HDPE	••••	—	—	—	—	—
Glucose aqueous	20	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
	GL	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Glycerine (glycerol), aqueous	any	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Glycol aqueous	H	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Glycocol aqueous	10	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Glycolic acid aqueous	30	PVDF	—	—	—	—	—	—
		PP	•••••	—	—	—	—	—
		HDPE	—	—	—	—	—	—
	70	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Heptane	TR	PVDF	—	—	—	—	—	—
		PP	•••••	—	—	—	—	—
		HDPE	••••	—	—	—	—	—

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Hexane	TR	PVDF	—	—	—	—	—	—
		PP	—	•••••	—	—	—	—
		HDPE	—	•••••	—	—	—	—
Hexanetriol (1,2,6)	TR	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrazine hydrate	TR	PVDF	•••••	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrobromic acid (solution) aqueous <sup>4)</sup>	48	PVDF	—	—	—	—	—	—
		PP	—	•••••	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrochloric acid aqueous <sup>14)</sup>	VL	PVDF	—	—	—	—	—	—
		PP	—	—	—	••••	—	—
		HDPE	—	—	—	—	—	—
	>32	PVDF	—	—	—	—	—	—
		PP	—	•••••	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrocyanic acid	L	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrocyanic acid aqueous	TR	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrofluoric acid aqueous <sup>34)</sup>	4	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
	40	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	•••••	—	—	—	—
	60	PVDF	—	—	—	—	—	—
		PP	—	—	—	••••	—	—
		HDPE	—	•••••	—	—	—	—
	70	PVDF	—	—	—	—	—	—
		PP	—	•••••	—	—	—	—
		HDPE	—	•••••	—	—	—	—
Hydrofluosilicic acid aqueous	32	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
	40	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrogen bromide gas <sup>5)</sup>	TR	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrogen chloride gas wet and dry <sup>2)</sup>	TR	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrogen gas	TR	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—
Hydrogen peroxide aqueous	30	PVDF	—	—	—	—	—	—
		PP	—	•••••	—	—	—	—
		HDPE	••••	—	—	—	—	—
	90	PVDF	—	—	—	—	—	—
		PP	••••	—	—	—	—	—
		HDPE	••••	—	—	—	—	—
Hydrogen sulphide aqueous	GL	PVDF	—	—	—	—	—	—
		PP	—	—	—	—	—	—
		HDPE	—	—	—	—	—	—

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# CHEMICAL RESISTANCE

# CHEMICAL RESISTANCE TABLE

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Hydrogen sulphide gas, dry	TR	PVDF						
		PP	=====					
		HDPE	=====					
Hydrogen-hyposulphite aqueous	VL	PVDF						
		PP	=====					
		HDPE	=====					
Hydroquinone	L	PVDF						
		PP	=====					
		HDPE	=====	....				
Hydroquinone	GL	PVDF						
		PP	=====					
		HDPE	=====	....				
Hydroxylamine sulphate aqueous	≥12	PVDF						
		PP	=====					
		HDPE	=====					
Iodine, tincture	H	PVDF						
		PP	=====	.....				
		HDPE	=====	....				
Iron (II)-chloride	GL	PVDF						
		PP	=====					
		HDPE	=====					
Iron (III)-chloride	GL	PVDF						
		PP	=====					
		HDPE	=====					
Iron (III)-nitrate	L	PVDF						
		PP	=====					
		HDPE	=====					
Iron (II)-sulphate	GL	PVDF						
		PP	=====					
		HDPE	=====					
Iron (III)-sulphate	GL	PVDF						
		PP	=====					
		HDPE	=====					
Isobutanol	TR	PVDF						
		PP	=====	.....				
		HDPE	=====					
Isobutyric acid	TR	PVDF	.....					
		PP	=====					
		HDPE	=====	.....				
Isooctane	TR	PVDF						
		PP	=====	.....				
		HDPE	=====	.....				
Isopropyl alcohol	TR	PVDF						
		PP	=====					
		HDPE	=====					
Lactic acid	TR	PVDF						
		PP	=====					
		HDPE	=====					
Lactic acid aqueous	90	PVDF						
		PP	=====					
		HDPE	=====					
Lanolin (wool oil)	H	PVDF						
		PP	=====	.....				
		HDPE	=====	.....				
Lead acetate aqueous	GL	PVDF						
		PP	=====	.....				
		HDPE	=====					
Lead tetraethyl (tetraethyl lead)	TR	PVDF						
		PP	=====					
		HDPE	=====					

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Light liquid paraffin	TR	PVDF						
		PP	=====	.....				
		HDPE	=====	.....				
Lighting gas	H	PVDF						
		PP	=====					
		HDPE	=====					
Linseed oil	H	PVDF						
		PP	=====					
		HDPE	=====					
Liquid ammonia (ammonia water)	GL	PVDF	0					
		PP	=====					
		HDPE	=====					
Magnesium carbonate	GL	PVDF						
		PP	=====					
		HDPE	=====					
Magnesium chloride aqueous	GL	PVDF						
		PP	=====					
		HDPE	=====					
Magnesium hydroxide	GL	PVDF						
		PP	=====					
		HDPE	=====					
Magnesium hydroxide carbonate	GL	PVDF						
		PP	=====					
		HDPE	=====					
Magnesium nitrate	GL	PVDF						
		PP	=====					
		HDPE	=====					
Magnesium salts	GL	PVDF						
		PP	=====					
		HDPE	=====					
Magnesium sulphate aqueous	GL	PVDF						
		PP	=====					
		HDPE	=====					
Maize seed oil	TR	PVDF						
		PP	=====	.....				
		HDPE	=====					
Malic acid aqueous	GL	PVDF						
		PP	=====					
		HDPE	=====					
Menthol	TR	PVDF						
		PP	=====	.....				
		HDPE	=====	.....				
Mercury	TR	PVDF						
		PP	=====					
		HDPE	=====					
Mercury (II)-chloride	GL	PVDF						
		PP	=====					
		HDPE	=====					
Mercury (II)-cyanide	GL	PVDF						
		PP	=====					
		HDPE	=====					
Mercury (II)-nitrate	L	PVDF						
		PP	=====					
		HDPE	=====					
Mercury salts	GL	PVDF						
		PP	=====					
		HDPE	=====					
Methane bromide (methyl bromide)	TR	PVDF						
		PP	0					
		HDPE	0					

# CHEMICAL RESISTANCE TABLE

# CHEMICAL RESISTANCE

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Methanol (methyl alcohol)	TR	PVDF	—	•••••				
		PP	—					
		HDPE	—					
Methanesulphonic acid (methylsulphuric acid), aqueous	≥50	PVDF	—					
		PP	•••••					
		HDPE	—					
	>50	PVDF	—					
		PP	••••					
		HDPE	••••					
Methyl alcohol (methanol)	5%	PVDF	—	•••••				
		PP	—					
		HDPE	—					
Methylamine aqueous	32	PVDF	••••					
		PP	—					
		HDPE	—					
Methoxybutanol	TR	PVDF	—	•••••				
		PP	—	•••••				
		HDPE	—	•••••				
Methoxybutyl alcohol	TR	PVDF	—	•••••				
		PP	—	•••••				
		HDPE	—					
Methylbenzoic acids (Toluene acids)	GL	PVDF	—					
		PP	—	••••				
		HDPE	••••					
Methyl bromide	TR	PVDF	—					
		PP	0					
		HDPE	0					
Methyl chloride	TR	PVDF	—					
		PP	0					
		HDPE	••••					
Methylene chloride (dichloromethane)	TR	PVDF	—					
		PP	••••					
		HDPE	••••					
Methyl ethyl ketone	TR	PVDF	0					
		PP	—	•••••				
		HDPE	—	•••••				
Milk	H	PVDF	—					
		PP	—					
		HDPE	—					
Mineral oil	H	PVDF	—					
		PP	—	•••••				
		HDPE	—	•••••				
Mineral water	H	PVDF	—					
		PP	—					
		HDPE	—					
Molasses	H	PVDF	—					
		PP	—					
		HDPE	—					
Naptha	H	PVDF	—					
		PP	—					
		HDPE	—					
Natural gas	TR	PVDF	—					
		PP	—					
		HDPE	—					
N,N-Dimethylformamide	TR	PVDF	0					
		PP	—					
		HDPE	—	••••				
Nickel (II)-chloride	GL	PVDF	—					
		PP	—					
		HDPE	—					

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Nickel (II)-nitrate	GL	PVDF	—					
		PP	—					
		HDPE	—					
Nickel salts	GL	PVDF	—					
		PP	—					
		HDPE	—					
Nickel (II)-sulphate	GL	PVDF	—					
		PP	—					
		HDPE	—					
Nicotinic acid	VL	PVDF	—					
		PP	—					
		HDPE	—					
Nitric acid aqueous	VL	PVDF	—					
		PP	—	•••••				
		HDPE	—					
	10-50	PVDF	—					
		PP	••••					
		HDPE	••••					
	>50 <85	PVDF	—	•••••				
		PP	0					
		HDPE	••••					
Nitrobenzene	TR	PVDF	—					
		PP	—	•••••				
		HDPE	—	•••••				
Nitrous fumes <sup>2)</sup>	GL	PVDF	—					
		PP	••••					
		HDPE	••••					
2-Nitrofluorene	TR	PVDF	—					
		PP	—	•••••				
		HDPE	—	••••				
Octylcresole	TR	PVDF	—					
		PP	••••					
		HDPE	••••					
Oil of turpentine	TR	PVDF	—					
		PP	0					
		HDPE	••••					
Oils essential	TR	PVDF	—					
		PP	••••					
		HDPE	••••					
Oils, vegetable and animal	TR	PVDF	—					
		PP	—	•••••				
		HDPE	—	•••••				
Oleic acid	TR	PVDF	—					
		PP	—	•••••				
		HDPE	—	•••••				
Oleum (H <sub>2</sub> SO <sub>4</sub> + SO <sub>3</sub> )	TR	PVDF	0					
		PP	0					
		HDPE	0					
Oleum fumes	VL	PVDF	0					
		PP	0					
		HDPE	0					
	L	PVDF	0					
		PP	0					
		HDPE	0					
Oxalic acid aqueous	GL	PVDF	—					
		PP	—					
		HDPE	—					
Oxygen	TR	PVDF	—					
		PP	—					
		HDPE	—	••••				

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Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Ozone gas <sup>4)</sup>	0.5 ppm	PVDF	—————					
		PP	—————					
		HDPE	●●●●					
Paraffin emulsions	TR	PVDF	—————					
		PP	—————					
		HDPE	—————●●●●●●					
Paraffin oil	TR	PVDF	—————					
		PP	—————●●●●●●					
		HDPE	—————●●●●●●					
Peanut oil	TR	PVDF	—————					
		PP	—————					
		HDPE	—————					
1-Pentanol (n-amylalcohol)	TR	PVDF	—————				●●●●	
		PP	—————					
		HDPE	—————●●●●					
2-Pentanol (sec-n-amylalcohol)	TR	PVDF	—————					
		PP	—————					
		HDPE	—————●●●●					
Peppermint oil	TR	PVDF	—————					
		PP	—————					
		HDPE	—————					
Perchloric acid aqueous	20	PVDF	—————					
		PP	—————					
		HDPE	—————					
	50	PVDF	—————					
		PP	—————●●●●●●					
	70	PVDF	—————					
PP		●●●●						
Perchloroethylene (tetrachloroethane)	TR	PVDF	—————				●●●●	
		PP	—————●●●●●●●●					
		HDPE	—————●●●●					
Petroleum	TR	PVDF	—————					
		PP	—————●●●●●●					
		HDPE	—————●●●●●●					
Petroleum ether	TR	PVDF	—————					
		PP	—————●●●●●●					
		HDPE	—————●●●●●●					
Phenol aqueous	5	PVDF	—————					
		PP	—————					
		HDPE	—————					
	90	PVDF	—————					
		PP	—————					
		HDPE	—————					
Phenylhydrazine	TR	PVDF	—————					
		PP	—————●●●●●●●●					
		HDPE	—————●●●●●●●●					
Phenylhydrochloride	TR	PVDF	—————					
		PP	—————●●●●●●					
		HDPE	—————					
Phosgene gas	TR	PVDF	—————					
		PP	—————●●●●●●●●					
		HDPE	●●●●					
Phosgene liquid	TR	PVDF						
		PP	0					
		HDPE	0					
Phosphates inorganic	GL	PVDF	—————					
		PP	—————					
		HDPE	—————					

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Phosphoric acid aqueous	95	PVDF	—————					
		PP	—————●●●●●●●●					
		HDPE	—————●●●●●●●●					
	50	PVDF	—————					
		PP	—————					
		HDPE	—————					
Phosphoric acid (ortho-)	85	PVDF	—————					
		PP	—————					
		HDPE	—————					
Phosphorus (III) chloride	TR	PVDF	—————					
		PP	—————●●●●					
		HDPE	—————●●●●●●●●					
Phosphorus oxychloride	TR	PVDF	—————					
		PP	—————●●●●					
		HDPE	—————●●●●●●●●					
Phosphorus pentoxide	TR	PVDF	—————					
		PP	—————					
		HDPE	—————					
Phosphorus trichloride	TR	PVDF	—————					
		PP	—————					
		HDPE	—————●●●●●●●●					
Photographic developing agents	H	PVDF	—————					
		PP	—————					
		HDPE	—————					
Phthalic acid	GL	PVDF	●●●●●●●●●●●●●●					
		PP	—————					
		HDPE	—————					
Picric acid (2, 4, 6 trinitrophenole)	GL	PVDF	—————					
		PP	—————					
		HDPE	—————					
Pine needle oil	H	PVDF	—————					
		PP	—————●●●●●●●●					
		HDPE	—————					
Potable water (chlorous)	TR	PVDF	—————					
		PP	—————					
		HDPE	—————					
Potassium aluminium sulphate (potassium alum)	L	PVDF	—————					
		PP	—————					
		HDPE	—————					
Potassium bicarbonate	GL	PVDF	—————					
		PP	—————					
		HDPE	—————					
Potassium bisulphate	GL	PVDF	—————					
		PP	—————					
		HDPE	—————					
Potassium hydrogen sulphite (potassium bisulphite)	L	PVDF	—————					
		PP	—————					
		HDPE	—————					
Potassium borate aqueous	1	PVDF	—————					
		PP	—————					
		HDPE	—————					
Potassium bromate aqueous	10	PVDF	—————					
		PP	—————					
		HDPE	—————					
Potassium bromate	GL	PVDF	—————					
		PP	—————					
		HDPE	—————					
Potassium bromide aqueous	GL	PVDF	—————					
		PP	—————					
		HDPE	—————					

# CHEMICAL RESISTANCE TABLE

# CHEMICAL RESISTANCE

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Potassium carbonate (potash)	GL	PVDF	0					
		PP						
		HDPE						
Potassium chlorate	GL	PVDF	••••••••••••••••					
		PP						
		HDPE						
Potassium chloride aqueous	GL	PVDF						
		PP						
		HDPE						
Potassium chromate aqueous	GL	PVDF	••••					
		PP						
		HDPE						
Potassium chrome (III) sulphate (chrome alum)	L	PVDF	••••					
		PP						
		HDPE						
Potassium cyanide (cyanide of potassium)	L	PVDF						
		PP						
		HDPE						
Potassium dichromate aqueous	GL	PVDF						
		PP						
		HDPE						
Potassium ferricyanide and potassium ferrocyanide, aqueous	GL	PVDF						
		PP						
		HDPE						
Potassium fluoride	L	PVDF						
		PP						
		HDPE						
Potassium hexacyano ferrate (II) and (III) yellow and red prussiate	GL	PVDF						
		PP						
		HDPE						
Potassium hypochlorite	L	PVDF	••••					
		PP	••••					
		HDPE	••••••••••					
Potassium iodide	GL	PVDF						
		PP						
		HDPE						
Potassium nitrate aqueous	GL	PVDF						
		PP						
		HDPE						
Potassium perchlorate aqueous	10	PVDF						
		PP						
		HDPE	••••••••					
	GL	PVDF	••••••••••••••••					
		PP						
		HDPE	••••••••					
Potassium permanganate aqueous	6	PVDF						
		PP						
		HDPE						
20	PVDF							
	PP							
	HDPE							
Potassium peroxodisulphate (potassium persulphate)	GL	PVDF						
		PP	••••••••					
		HDPE						
Potassium phosphate	GL	PVDF						
		PP						
		HDPE						
Potassium sulphate	GL	PVDF						
		PP						
		HDPE						

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Potassium sulphide	L	PVDF	••••••••••••••••					
		PP						
		HDPE						
Potatoe spirit oil	TR	PVDF						
		PP						
		HDPE			••••			
Propane gas	TR	PVDF	••••					
		PP						
		HDPE						
Propane liquid	TR	PVDF	••••					
		PP						
		HDPE	••••					
Propionic acid aqueous	50	PVDF						
		PP						
		HDPE						
Propionic acid	TR	PVDF						
		PP						
		HDPE			••••••••			
Propanol-(1) (propyl alcohol)	TR	PVDF						
		PP						
		HDPE						
Propargyl alcohol aqueous	7	PVDF						
		PP						
		HDPE						
Propylene glycol	TR	PVDF						
		PP						
		HDPE						
Pyridine	TR	PVDF						
		PP	••••••••••					
		HDPE	••••••••					
Roaster dry	any	PVDF						
		PP						
		HDPE						
Salicylic acid	GL	PVDF						
		PP						
		HDPE						
Sea water (lake water)	H	PVDF						
		PP						
		HDPE						
Silicic acid aqueous	H	PVDF						
		PP						
		HDPE						
Silicone emulsion	H	PVDF						
		PP						
		HDPE						
Silicone oil	TR	PVDF						
		PP						
		HDPE						
Silver acetate	GL	PVDF						
		PP						
		HDPE						
Silver cyanide	GL	PVDF						
		PP						
		HDPE						
Silver nitrate aqueous	GL	PVDF						
		PP						
		HDPE					••••••••	
Silver salts	GL	PVDF						
		PP						
		HDPE						



# CHEMICAL RESISTANCE

# CHEMICAL RESISTANCE TABLE

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Soaps aqueous	GL	PVDF						
		PP						
		HDPE						
Soda (sodium bicarbonate)	50	PVDF						
		PP						
		HDPE						
Soda lye (sodium hydroxide) aqueous	40	PVDF	0					
		PP						
		HDPE						
	60	PVDF	0					
		PP						
		HDPE						
Sodium acetate	GL	PVDF						
		PP						
		HDPE						
Sodium benzoate	GL	PVDF						
		PP						
		HDPE						
Sodium benzoate aqueous	35	PVDF						
		PP						
		HDPE						
Sodium borate hydrogen peroxide (sodium perborate)	GL	PVDF						
		PP						
		HDPE		••••••••				
Sodium bromide	GL	PVDF						
		PP						
		HDPE						
Sodium carbonate	GL	PVDF						
		PP						
		HDPE						
Sodium carbonate aqueous	50	PVDF						
		PP			••••••••			
		HDPE						
Sodium chlorate aqueous	GL	PVDF	••••••••••••••••					
		PP						
		HDPE						
Sodium chlorite aqueous	2-20	PVDF						
		PP		••••••••				
		HDPE						
Sodium cyanide	GL	PVDF						
		PP						
		HDPE						
Sodium dichromate	GL	PVDF						
		PP						
		HDPE						
Sodium fluoride	GL	PVDF						
		PP						
		HDPE						
Sodium hexacyanferat (II) (sodium ferrocyanide)	GL	PVDF						
		PP						
		HDPE						
Sodium hexacyanferat (III) (sodium ferrocyanide)	GL	PVDF						
		PP						
		HDPE						
Sodium hexametaphosphate	L	PVDF						
		PP						
		HDPE						
Sodium hydrogen carbonate (sodium bicarbonate)	GL	PVDF						
		PP						
		HDPE						

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Sodium hydrogen sulphate	GL	PVDF						
		PP						
		HDPE						
Sodium hydrogen sulphite (sodium bisulphite)	L	PVDF						
		PP						
		HDPE						
Sodium hypochlorite aqueous	10	PVDF	••••••••••••••••					
		PP						
		HDPE						
	20	PVDF	••••••••••••••••					
		PP						
		HDPE						
Sodium hypochlorite (bleaching lye) 15% act Cl <sub>2</sub> aqueous	L	PVDF	0					
		PP	••••					
		HDPE	••••					
Sodium nitrate	GL	PVDF						
		PP						
		HDPE						
Sodium nitrite	GL	PVDF						
		PP						
		HDPE						
Sodium phosphate (-tri-)	GL	PVDF						
		PP						
		HDPE						
Sodium silicate (water glass)	L	PVDF						
		PP						
		HDPE						
Sodium sulphate	GL	PVDF						
		PP						
		HDPE						
Sodium sulphide	GL	PVDF	••••••••••••••••					
		PP						
		HDPE						
Sodium sulphide aqueous	40	PVDF						
		PP						
		HDPE						
Sodium tetraborate (borax)	L	PVDF						
		PP						
		HDPE						
	GL	PVDF						
		PP						
		HDPE						
Sodium thiosulphate	GL	PVDF						
		PP						
		HDPE						
Soybean oil	TR	PVDF						
		PP		••••••••••				
		HDPE		••••••••••				
Spindle oil	TR	PVDF						
		PP		••••••••••				
		HDPE		••••~••••••				
Spirits of all kinds	H	PVDF						
		PP						
		HDPE						
Starch syrup	any	PVDF						
		PP						
		HDPE						
Starch aqueous	any	PVDF						
		PP						
		HDPE						

# CHEMICAL RESISTANCE TABLE

# CHEMICAL RESISTANCE

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Starch sugar (glucose), aqueous	GL	PVDF						
		PP						
		HDPE						
Stearic acid	TR	PVDF						
		PP	.....					
		HDPE	.....					
Succinic acid	GL	PVDF						
		PP						
		HDPE						
Sulphur dioxide aqueous	any	PVDF	0					
		PP						
		HDPE						
Sulphur dioxide wet and aqueous	any	PVDF	0					
		PP						
		HDPE						
Sulphur dioxide, gas dry	any	PVDF						
		PP						
		HDPE						
Sulphur trioxide	TR	PVDF	0					
		PP	0					
		HDPE	0					
Sulphurous acid aqueous	any	PVDF	0					
		PP						
		HDPE						
Sulphuryl chloride (sulphonyl chloride)	TR	PVDF						
		PP	0					
		HDPE	0					
Sulphuric acid	TR	PVDF	.....					
		PP	.....					
		HDPE	.....					
Sulphuric acid aqueous	VL	PVDF						
		PP						
		HDPE						
	10-50	PVDF						
		PP						
		HDPE						
Tallow	TR	PVDF						
		PP						
		HDPE						
Tannic acid (tannin) aqueous	10	PVDF						
		PP						
		HDPE						
Tanning extracts of cellulose	H	PVDF						
		PP						
		HDPE						
Tanning extracts vegetable	H	PVDF						
		PP						
		HDPE						
Tartaric acids aqueous	H	PVDF						
		PP						
		HDPE						
Test benzene	TR	PVDF						
		PP	.....					
		HDPE	.....					
Tetrachloroethane	TR	PVDF	.....					
		PP	.....					
		HDPE	.....					
Tetrachloroethene (perchloroethylene)	TR	PVDF						
		PP	.....					
		HDPE	.....					

Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Tetrachloromethane	TR	PVDF						
		PP	0					
		HDPE	0					
Tetrahydrofuran	TR	PVDF	.....					
		PP	.....					
		HDPE	.....					
Tetralin (tetrahydronaphthaline)	TR	PVDF						
		PP	0					
		HDPE	.....					
Tin (IV)-chloride	GL	PVDF						
		PP						
		HDPE						
Tin (II)-chloride	GL	PVDF						
		PP						
		HDPE						
Thionyl chloride	TR	PVDF	.....					
		PP	0					
		HDPE	0					
Thiophene	TR	PVDF						
		PP	.....					
		HDPE	.....					
Toluene	TR	PVDF						
		PP	.....					
		HDPE	.....					
Transformer oil (insulating oil)	TR	PVDF						
		PP	.....					
		HDPE	.....					
Trichloroacetic acid aqueous	50	PVDF	.....					
		PP						
		HDPE						
Trichloroethylene (trichloroethene)	TR	PVDF						
		PP						
		HDPE	.....					
Tricresyl phosphate	TR	PVDF						
		PP	.....					
		HDPE						
Trietanolamine	L	PVDF						
		PP						
		HDPE	.....					
Triocetyl phosphate		PVDF						
		PP						
		HDPE	.....					
Urea aqueous	L	PVDF						
		PP						
		HDPE						
	GL	PVDF						
		PP						
		HDPE						
Urine		PVDF						
		PP						
		HDPE						
Vinegar (wine vinegar)	H	PVDF						
		PP						
		HDPE						
Vinyl acetate	TR	PVDF						
		PP	.....					
		HDPE	.....					
Vinylidene chloride (1, 1-dichloroethylene)	TR	PVDF						
		PP	0					
		HDPE	0					

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Medium	Concentration	Material	Temperature ° F					
			68	104	140	176	212	248
Water pure	H	PVDF						
		PP						
		HDPE						
Wines and spirits (sodium benzoate)	H	PVDF						
		PP						
		HDPE						
Wine vinegar (edible vinegar)	H	PVDF						
		PP						
		HDPE						
Xylene (all isomers)	TR	PVDF						
		PP	0					
		HDPE	••••••••					
Yeast	GL	PVDF						
		PP						
		HDPE						
Yeast bitter	H	PVDF						
		PP						
		HDPE						
Zinc carbonate	GL	PVDF						
		PP						
		HDPE						
Zinc chloride aqueous	GL	PVDF						
		PP						
		HDPE						
Zinc oxide	GL	PVDF						
		PP						
		HDPE						
Zinc salts	GL	PVDF						
		PP						
		HDPE						
Zinc sulphate aqueous	GL	PVDF						
		PP						
		HDPE						

**Symbols:**

1. Penetration of HCl possible
2. Oxidizing
3. Penetration of HF possible
4. Medium might cause stress cracking
5. Penetration of HBr possible
6. PVDF requires UV protection

**CHEMICAL RESISTANCE CHECK REQUEST FORM  
PIPING SYSTEMS**

Attention: Engineered Products Division

**Requester's Information**

Company Name	
Address	
Phone	
Fax	
Contact Name	

**Project Information**

End User Name	
Project Name	
Contact	
Address	
Phone	

**Chemical Information**

Chemical (s) and Concentration	
Operating Temperature	
Operating Pressure	
Flow Rates	
UV Exposure	

**Comments** *(Note any other information that may assist in material selection)*

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