Chemical Resistance Guide

THERMOPLASTIC PIPING SYSTEMS

CHEMICAL RESISTANCE GUIDE

Thermoplastics:
ABS, PVC, CPVC, PE, PEX, PP, PVDF

Elastomers:
EPDM, FPM (FKM), SBR,
BUNA-N (Nitrile)

IPEX
Committed to Excellence

Chemical Resistance Guide

Technical Information

About IPEX

At IPEX, we have been manufacturing non-metallic pipe and fittings since 1951. We formulate our own compounds and maintain strict quality control during production. Our products are made available for customers thanks to a network of regional stocking locations throughout North America. We offer a wide variety of systems including complete lines of piping, fittings, valves and custom-fabricated items.

More importantly, we are committed to meeting our customers' needs. As a leader in the plastic piping industry, IPEX continually develops new products, modernizes manufacturing facilities and acquires innovative process technology. In addition, our staff take pride in their work, making available to customers their extensive thermoplastic knowledge and field experience. IPEX personnel are committed to improving the safety, reliability and performance of thermoplastic materials. We are involved in several standards committees and are members of and/or comply with the organizations listed on this page.

For specific details about any IPEX product, contact our customer service department.

CHEMICAL RESISTANCE GUIDE

INTRODUCTION

Thermoplastics and elastomers have outstanding resistance to a wide range of chemical reagents. The chemical resistance of plastic piping is basically a function of the thermoplastic material and the compounding components. In general, the less compounding components used the better the chemical resistance. Thermoplastic pipes with significant filler percentages may be susceptible to chemical attack where an unfilled material may be affected to a lesser degree or not at all.

Some newer piping products utilize a multi-layered (composite) construction. Both thermoplastic and non-thermoplastic materials are used for the layers. Layered composite material pipe may have chemical resistance that differs from the chemical resistance of the individual material. Such resistance however, is a function both of temperatures and concentration, and there are many reagents which can be handled for limited temperature ranges and concentrations. In borderline cases, it will be found that there is limited attack, generally resulting in some swelling due to absorption. There are also many cases where some attack will occur under specific conditions, but for many such applications, the use of plastic will be justified on economic grounds when considered against alternative materials. Resistance is often affected (and frequently reduced) when handling a number of chemicals or compounds containing impurities. For this reason, when specific applications are being considered, it may be worthwhile to carry out tests using the actual product that will be encountered in service. The listing that follows does not address chemical combinations.

The data in the following tables were obtained from numerous sources in the industry. The information is based on immersion tests on unstressed coupons, experiments and, when available, actual process experience as well as data from tests inclusive of stress from temperature and pressure. The end user should be aware of the fact that actual service conditions will affect the chemical resistance.

Chemicals that do not normally affect the properties of an unstressed thermoplastic may cause completely different behavior (such as stress cracking) when under thermal or mechanical stress (such as constant internal pressure or frequent thermal or mechanical stress cycles). Chemical resistance data from immersion tests cannot be unconditionally applied to thermoplastic piping components subjected to continuous or frequent mechanical or thermal stresses.

When the pipe will be subject to a continuous applied mechanical or thermal stress or to combinations of chemicals, testing that duplicates the expected field conditions as closely as possible should be performed on representative samples of the pipe product to properly evaluate plastic pipe for use in this application.

RATINGS

1 High Resistance - All materials belonging to this class are completely or almost completely inert when used with the specified chemical at the specified concentration/temperature levels.

2 Limited Resistance - All materials belonging in this class are partially attacked by the specified chemicals at the specified concentration/temperature levels. Life expectancy is thus shortened and it is recommended to use a higher safety factor than that adopted for Class 1 materials.

3 No Resistance - All materials in this class are severely attacked by the specified chemicals at the specified concentration/temperature levels. They should, therefore, not be used.

The absence of any class indication for any given materials, signifies the absence of data for such material(s) with respect to the specific chemical(s), temperature(s) and concentration(s).

THERMOPLASTICS

ABS - (Acrylonitrile-Butadiene-Styrene) is ideal for residential and commercial sanitary (DWV) systems. With a working pressure up to 230 psi, ABS is also suitable for industrial applications such as mine slurry lines. Temperature range is -40°C (-40°F) to 82°C (180°F). ABS is resistant to a wide variety of materials ranging from sewage to household chemicals. It is joined by solvent cementing or threading.

PVC - (Polyvinyl Chloride) is the most frequently specified of all thermoplastic-piping materials. It has been used successfully for over 60 years. PVC is characterized by distinctive physical properties, and is resistant to corrosion and chemical attack by acids, alkalis, salt solutions and many other chemicals. It is attacked, however by polar solvents such as ketones and aromatics. Of the various types and grades of PVC used in plastic piping, Type 1, Grade 1 PVC (Cell Classifications 12454) conforming to ASTM D1784, is the most common. The maximum service temperature for PVC is 60°C (140°F) under pressure and 82°C (180°F) in drainage. With a design stress of 2,000 psi, PVC has the highest long-term hydrostatic strength 22.7°C (73°F) of any other major thermoplastic material used for piping. PVC piping is joined by solvent cementing, threading, flanging, grooving, gasketed joints, or mechanical joints.

CPVC - (Chlorinated PVC) (Cell Classification 23447), conforming to ASTM D 1784 has physical properties at 22.7°C (73°F) similar to those of PVC; its chemical resistance is similar to or generally better than that of PVC. With a design stress of 2,000 psi and maximum service temperature of 93.3°C (200°F), CPVC has proven to be an excellent piping material for hot corrosive liquids, hot and cold water distribution and similar applications above the temperature range of PVC. CPVC piping is joined by solvent cementing, threading, flanging or grooved joints.

PE - (Polyethylene) is a member of the polyolefin group. It is tough and flexible even at subfreezing temperatures. Pipes are generally formulated with only an antioxidant and some pigments, usually carbon black, to screen out ultraviolet radiation. ASTM D 1248 classifies three types. Type I low density, Type II medium density and Type III high density. Pipe is usually made from medium or high density for higher strength and hardness. PE is generally used for gas distribution, water lines and slurry lines.

PEX - (Cross-linked Polyethylene) is high density PE that undergoes a treatment to link single strands of PE through radical reactions between the molecules to form a dense network with up to 80% crosslinking. The primary reason to crosslink PE is to raise the thermal stability of the material. Service temperatures are raised to 82°C (180°F). PEX pipe is primarily used for plumbing and radiant floor heating systems.

PP - (Polypropylene) is a lightweight polyolefin and generally high in chemical resistance. Although Type 1 polypropylene conforming to ASTM D2146 is slightly lower in physical properties than PVC, it is chemically resistant to organic solvents as well as acids and alkalis. Generally, polypropylene should not be used in contact with strong oxidizing acids, chlorinated hydrocarbons and aromatics. Polypropylene has a design stress of 1,000 psi at 22.7°C (73°F), and has proven to be an excellent material for laboratory and industrial drainage pipe where mixtures of acids, bases and solvents are involved. Polypropylene is joined by the electro fusion process, socket/butt/IR welding as well as mechanical joints.

PVDF - (Polyvinylidene Fluoride) is a strong, abrasion-resistant thermoplastic with excellent heat stability and chemical resistance typical of fluorocarbon polymers. It can be used in temperatures up to 149°C (300°F) with a wide variety of acids, bases and organic solvents, and is ideally suited for handling wet or dry chlorine, bromine and other halogens. No other thermoplastic piping material can approach the combination of strength, chemical resistance and operating temperature that PVDF piping systems can offer. Electro fusion socket/butt/IR welding, threading, or flanged connections are the joining methods used for PVDF.

ELASTOMERS

BUNA-N - (Nitrile) (NBR) is a general purpose oil resistant polymer known as nitrile rubber. BUNA-N is a copolymer of butadiene and acrylonitrile. BUNA-N has good solvent, oil, water and hydraulic fluid resistance. It displays good compression set, abrasion resistance and tensile strength. BUNA-N 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. Temperature range -54°C (-65°F) to 135°C (275°F).

EPDM - (EPM) is an elastomer made from ethylene-propylene 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, ageing and ozone resistance. It is fairly good with ketones and alcohols and has an excellent temperature range from -54°C (-65°F) to 49°C (300°F).

Fluorocarbon - (FPM) (FKM) (Viton®) 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. Temperature range -29°C (-15°F) to 204°C (400°F).

SBR - (Styrene-Butadiene) The basic monomers are butadiene and styrene, with styrene content approximately 23.5%. It is useful over a temperature range of -57°C (-70°F) to 107°C (224°F). It is compatible with water, alcohol, and weak acids but is not compatible with mineral oils, petroleum greases and fuels.

Teflon® - (PTFE) Polytetrafluoroethylene has outstanding resistance to chemical attack by most chemicals and solvents. PTFE has a temperature rating of -29°C (-20°F) to 204°C (400°F) in valve applications. PTFE, a self lubricating compound, is used as a seat material in ball valves. PTFE is not included in this chart because it is resistant to all listed compounds.

Viton® is a registered trademark of DuPont Dow Elastomers.

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Acetaldehyde	3	3	3	3	3	3	3	3	2	3				3						3		
Acetaldehyde Aqueous, 40%	2	3							1	1	1	2	3	3						3		
Acetamide	1			1					1						1					1		
Acetic Acid, 10%	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Acetic Acid, 20%	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Acetic Acid, 25%	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Acetic Acid, 30%	1	2	2	1		2			1	1	1	1	1	1	1	1	1	1		3	3	
Acetic Acid, 60%	1	2	2	1		2			1	1	1	2	2	1	1	1	2	2		3	3	
Acetic Acid, 80%	1	2	2	1				2	1	3	3	3	3	1	1	1	2	2		3	3	
Acetic Acid, 85%	1			3					1					1						3		
Acetic Acid Glacial, 100%	2	3	3	2	3	3	3	3	1	2	2		3	1	2	2		3		3	3	
Acetic Acid, Hot,																						
Acetic Acid, Vapor	1			1					1											1		
Acetic Anhydride	3								1	2	2		3	3	3	3		3		3	3	
Acetone	3			3					1	1	1			3						3		
Acetone, 5%	3			3					1											3		
Acetone, pure	3	3	3	3	3	3	3	3	1	1	1			2		3		3		3	3	
Acetone, up to 5%				1																		
Acetonitrile									1					2						3		
Acetopheneditin																						
Acetophenone									1		3			1		1				3		3
Acetyl Acetone	3			3										3								
Acetyl Bromide														1								
Acetyl Chloride	3			3					1					1								
Acetyl Nitrite	3			3										1								
Acetyl-dI-Alanine																						
Acetyl-dI-Valine-n																						
Acetyl-dl-Leucine-n																						
Acetyl-dl-Methionine-n																						
Acetyl-dl-Tryptophan-n																						
Acetylene Gas, 100%	3			3					1					1						1		
Acetylene Tetrabromide																						
Acetylnitrile			3	3	3				1		1			2		3		3		3		3
Acetylsalicylic Acid																						
Acrylonitrile	3			3					2					1						3		
Adipic Acid, Sat'd	1	1	2	1					1	1	1	1	1	1		1						
Aero Lubriplate																						
Alanine-dI																						
Alcohols	1			1					1					1								
Allyl Alcohol, 96 %	2	3	3	1					1	1	1		1	1						3		3
Allyl Chloride	3			3										1								
Aloin																						
Aluminum Acetate, Sat'd	1			1					1					1						2		
Aluminum Ammonium	1			1					1					1								
Aluminum Bromide	1			1					1					1								
Aluminum Chloride, Sat'd	1	1	1	1		1			1	1	1	1	2	1	1	1	1	1	1	1		1
Aluminum Fluoride, Sat'd	1		1	1					1					1		1				1		1
Aluminum Hydroxide, Sat'd	1		1	1					1					1		1				1		
Aluminum Nitrate, Sat'd	1		1	1					1					1		1				1		

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Acetaldehyde				2					1	2	3			2	3						2
Acetaldehyde Aqueous, 40%				2					1	1	1	1	1	2	3						2
Acetamide	1			1					1					3						1	3
Acetic Acid, 10%	1			1					1	1	2			2	3					3	1
Acetic Acid, 20%	1			1					1	1	2			2	3					2	1
Acetic Acid, 25%	1			1					1	1	2			2	3					3	1
Acetic Acid, 30%	1			1					1		3			1						2	1
Acetic Acid, 60%	1			1									3	1						3	1
Acetic Acid, 80%	1			2					2		3	3	3	1				2		3	2
Acetic Acid, 85%	1																			3	2
Acetic Acid Glacial, 100%	1			1					3	3	1	3	3	2	3	3	3	3		2	1
Acetic Acid, Hot																				3	3
Acetic Acid, Vapor	1																				
Acetic Anhydride	1			1					2					3						3	3
Acetone									1	1	1			3	3	3				3	3
Acetone, 5%				1																	
Acetone, pure									1	1	1					3		3			
Acetone, up to 5%																					
Acetonitrile				1					3												2
Acetopheneditin	1																				
Acetophenone	1			1					1					3						3	3
Acetyl Acetone									1					3						3	3
Acetyl Bromide																					
Acetyl Chloride									3					3							3
Acetyl Nitrite									3					3							
Acetyl-dI-Alanine	1																				
Acetyl-dI-Valine-n	1																				
Acetyl-dl-Leucine-n	1																				
Acetyl-dl-Methionine-n	1																				
Acetyl-dl-Tryptophan-n	1																				
Acetylene Gas, 100%	1			1					1					1						1	1
Acetylene Tetrabromide	3								1					1						3	3
Acetylnitrile									2							2					
Acetylsalicylic Acid	1																				
Acrylonitrile	1								3											3	2
Adipic Acid, Sat'd	1								1	1	1			1	1	1					1
Aero Lubriplate									3					1						1	1
Alanine-dI	1																				
Alcohols									1					1							
Allyl Alcohol, 96 %	1			1					2	2	2	3		2	3			3		1	
Allyl Chloride				2					3					2						2	
Aloin	1																				
Aluminum Acetate, Sat'd	1								1					3						2	3
Aluminum Ammonium	1			1					1					1						1	1
Aluminum Bromide				1					1					1						1	1
Aluminum Chloride, Sat'd	1			1					1	1	1			1	1	1	1	1	1	1	1
Aluminum Fluoride, Sat'd	1			1					1					1						1	1
Aluminum Hydroxide, Sat'd	1			1					1					1						1	
Aluminum Nitrate, Sat'd	1			1					1					1						1	1

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Aluminum Oxalate																						
Aluminum Oxide																						
Aluminum Oxychloride	1			1					1					1								
Aluminum Potassium Sulfate, Sat'd	1			1					1					1						1		
Aluminum Salts																						
Aluminum Sodium Sulfate																						
Aluminum Sulfate, Sat'd	1	1	1	1		1		1	1	1	1	1	1	1	1	1	1	1	1	1		1
Alums, NH3-Cr-K																						
Ambrex 33 (Mobil)																						
Ambrex 830 (Mobil)																						
Amines																						
Amino Acetic Acid																						
Aminobutric-a-dI Acid																						
Aminoisobutyric-2 Acid																						
Ammonia Anhydrous																						
Ammonia Gas	1			1					1					3						3		
Ammonia Gas, Cold	1	1	1						1	1	1			1	1	2	2	2		3		
Ammonia Liquid	2		3	1					1					1		1				1		
Ammonium Acetate, Sat'd	1	1	2	1					1	1	1	1	1	1	1	1	1	1		1		
Ammonium Benzoate				1					1													
Ammonium Bifluoride, Sat'd	1			1					1					1								
Ammonium Bisulfide	1													1								
Ammonium Bromide																						
Ammonium Carbonate, Sat'd	1	1	2	1					1	1	1	1	1	1	1	1	1	1	1	1		1
Ammonium Chloride, Sat'd	1		1	1		1		1	1		1		2	1		1		1		1	1	1
Ammonium Citrate				1																		
Ammonium Dichromate	1			1										1								
Ammonium																						
Ammonium Fluoride, 10%	1			1					1					1						1		
Ammonium Fluoride, 20%	1		2	1		1			1		1			1		1		3		1	1	1
Ammonium Fluoride, 25%	1		2	1		1			1		1			1		1		3		1	1	1
Ammonium Fluoro Silicate																						
Ammonium Glycolate																						
Ammonium Hydroxide,10%	1	1	1	3	3	3	3	3	1	1	1	1	2	1	1	1	1	1	1	1	1	1
Ammonium	1			1					1					1						1		
Ammonium Molybdate																						
Ammonium Nitrate, Sat'd	1		1	1		1		1	1		1		1	1		1		1		1	1	
Ammonium Nitrite																						
Ammonium Oxalate																						
Ammonium Oxylate																						
Ammonium Persulfate	1		1	1					1					1						1		
Ammonium Persulfate,10%																						
Ammonium Phosphate, Dibasic	1	1	1	1		2			1	1	1	1	1	1	1	1	1	1	1	1		3
Ammonium Phosphate, Monobasic	1	1	1	1					1	1	1	1	1	1	1	1	1	1	1	1		

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Aluminum Oxalate	2																				
Aluminum Oxide	1																				
Aluminum Oxychloride																					
Aluminum Potassium Sulfate, Sat'd	1			1					1					1						1	1
Aluminum Salts									1						1					1	1
Aluminum Sodium Sulfate	1																				
Aluminum Sulfate, Sat'd	1								1	1	1			1	1	1	1	1			1
Alums, NH3-Cr-K									1					1						1	1
Ambrex 33 (Mobil)									1					1						1	3
Ambrex 830 (Mobil)									1					1						1	3
Amines									3					2						3	1
Amino Acetic Acid	1																				
Aminobutric-a-dI Acid	1																				
Aminoisobutyric-2 Acid	1																				
Ammonia Anhydrous	2																				3
Ammonia Gas	1			1					1					3						1	1
Ammonia Gas, Cold									1					1	3					1	1
Ammonia Liquid	1								1					3		3				2	3
Ammonium Acetate, Sat'd	1			1					1	1	1	2		1	1	1		1		1	
Ammonium Benzoate																					
Ammonium Bifluoride, Sat'd	1			1					1					1						1	
Ammonium Bisulfide																				1	
Ammonium Bromide	1																				
Ammonium Carbonate, Sat'd	1			1					1	1	1	1		1	1	1	1				1
Ammonium Chloride, Sat'd	1			1					1					1		1		1		1	1
Ammonium Citrate																					
Ammonium Dichromate	2								2					1						1	
Ammonium				1																	
Ammonium Fluoride, 10%	1								1												
Ammonium Fluoride, 20%														1				3			
Ammonium Fluoride, 25%	1								1					1				3		1	
Ammonium Fluoro Silicate				1																	
Ammonium Glycolate	1																				
Ammonium Hydroxide	1	2							1	1	1	1		1	2	2				1	2
Ammonium	1			1					1					1						1	1
Ammonium Molybdate	1			1																	
Ammonium Nitrate, Sat'd	1			1					1					1		1		1		1	1
Ammonium Nitrite									1											1	1
Ammonium Oxalate			1																		
Ammonium Oxylate	2																				
Ammonium Persulfate	1								1					1						3	3
Ammonium Persulfate,10%									1											3	3
Ammonium Phosphate, Dibasic	1			1					1	1	1	1		1	1	1	1	1		1	
Ammonium Phosphate, Monobasic	1								1	1	1	1		1	1	1	1	1		1	1

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Ammonium Phosphate	1	1	1	1					1	1	1	1	1	1	1	1	1	1	1			
Ammonium Potassium	1			1					1					1						1		
Ammonium Sulfamate				1																		
Ammonium Sulfate	1	1	2	1					1	1	1	1	1	1	1	1	1	1	1	1		
Ammonium Sulfide, Dilute	1		2	1					1		1			1		1				1		1
Ammonium Sulfocyanide																						
Ammonium Tartarate				1																		
Ammonium Thiocyanate	1			1					1					1						1		
Ammonium Thioglycolate																						
Amonia Acetate, Sat'd	1			1					1											1		
Amonia Gas	1			3					1											3		
Amonia Liquid	3			3					1											1		
Amyl Acetate	3		3	3		3			2	2				1	2	2		2		3		3
Amyl Alcohol, Pure	1	1	2	1		1		1	1	1	1	1	1	1	1	1	1	1	2	3		3
Amyl Borate																						
Amyl Chloride	3			3					3					1						3		
Amyl Chloronaphthalene																						
Amyl Naphthalene																						
Amyl Phthalate																						
Ang-25 (Glyceral Ester)																						
Aniline	3		3	3		3		3	2					1	1	2		3		3		3
Aniline Chlorohydrate	2		3	3		3		3	2		2		3	1		2						
Aniline Dyes																						
Aniline Hydrochloride,	1	2		3					1	1	2			1								
Aniline Sulphate																						
Animal Oil																						
Anthranilac Acid																						
Anthraquinone	1			1					1													
Anthraquinone Sulfonic	1			1					1													
Antimony Trichloride	1	1	1	1					1	1	1			1	1	1				2		
Aqua Regia	1	2	2	2	2	2	2	2	2	3	3	3	3	2						3		
Arachidic Acid																						
Argon, Dry																						
Aromatic Fuel, 50%																						
Aromatic Hydrocarbons	3			3																		
Arsenic Acid, 80%	1	1	2	1	2	2	2	2	1	1	1	1	2	1	1	1	1	1	1			
Arsenic Trioxide (Powder)	1																					
Arylsulfonic Acid	1																					
Ascorbic Acid																						
Askarel																						
Asphalt	3			3					1					1								
ASTM Oil, No. 1	1																					
ASTM Oil, No. 2	1																					
ASTM Oil, No. 3	1																					
Atropine Sulfate																						
Aurex 903R (Mobile)																						
Automatic Transmission																						
Automotive Brake Fluid	2								1											3		
Bardol B																						
Barium Acetate, Sat'd																						

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
°F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Ammonium Phosphate									1	1	1	1		1	1	1	1	1		1	
Ammonium Potassium	1			1					1					1						1	1
Ammonium Sulfamate				1																	
Ammonium Sulfate	1			1					1	1	1	1		1	1	1	1	1		1	1
Ammonium Sulfide, Dilute	1			1					1					1						1	1
Ammonium Sulfocyanide	1																				
Ammonium Tartarate																					
Ammonium Thiocyanate,	1													1						1	
Ammonium Thioglycolate	2																				
Amonia Acetate, Sat'd	1																				
Amonia Gas	1																				
Amonia Liquid	1																				
Amyl Acetate	1			1					2		3		3	1	2	3		3		3	3
Amyl Alcohol, Pure	1			1					1	1	1			2						2	1
Amyl Borate									3					3						1	3
Amyl Chloride				2					3					1							3
Amyl Chloronaphthalene									3					1						3	3
Amyl Naphthalene									3					1						3	3
Amyl Phthalate	1																				
Ang-25 (Glyceral Ester)									1					1						2	1
Aniline	1			1					1					1	2	2				3	3
Aniline Chlorohydrate														1		2					
Aniline Dyes									2					2						3	1
Aniline Hydrochloride	1			1					1	1	1	1	1	2						3	2
Aniline Sulphate	2																				
Animal Oil									2					1						1	3
Anthranilac Acid	1																				
Anthraquinone																					
Anthraquinone Sulfonic	1													1							
Antimony Trichloride	1			1					1					1						1	
Aqua Regia	3				3				1	1	1	1	1	2						3	3
Arachidic Acid				1																	
Argon, Dry									1					1							
Aromatic Fuel, 50%									3					1						2	3
Aromatic Hydrocarbons																					
Arsenic Acid, 80%	1			1					1	1	1	1		1	1	1	1	1		1	1
Arsenic Trioxide (Powder)	2			1																1	
Arylsulfonic Acid	1																				
Ascorbic Acid				1																	
Askarel									3					1						2	3
Asphalt	3								3					1						2	3
ASTM Oil, No. 1									3					3						1	3
ASTM Oil, No. 2									3					1						1	3
ASTM Oil, No. 3									3					1						1	3
Atropine Sulfate	1																				
Aurex 903R (Mobile)									3					1						1	3
Automatic Transmission									3					1						1	
Automotive Brake Fluid	1								1					3							1
Bardol B									3					1						3	3
Barium Acetate, Sat'd									1					1						1	1

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Barium Bromide																						
Barium Carbonate, Sat'd	1		1	1					1		1			1		1				1		1
Barium Chloride, Sat'd	1	1	1	1					1		1			1		1				1		1
Barium Cyanide																						
Barium Hydroxide, 10%	1	1	1	1					1	1	1			1		2						
Barium Hydroxide, Sat'd	1	1	1	1					1	1	1			1		2				1		1
Barium Nitrate, Sat'd	1			1					1					1						1		
Barium Sulfate, Sat'd	1	1	1	1					1		1			1	1	1				1	1	1
Barium Sulfide, Sat'd	1	1	1	1					1					1	1	1				1	1	1
Bayol 35																						
Bayol D																						
Beer	1	1	1	1					1	1	1			1	1	1	1			1	1	1
Beet Sugar Liquors	1			1					1					1								
Benzal Chloride																						
Benzaldehyde	3		3	3					3		3			1		2				3		3
Benzaldehyde, 1%																						
Benzaldehyde, 10%	1			1					1					1						3		
Benzaldehyde, >10%	3																					
Benzaldehyde, 10%																						
Benzaldehyde, 5%																						
Benzalkonium Chloride	1																					
Benzamide																						
Benzene	3	3	3	3					2		3		3	1	2	2				3	3	3
Benzene Sulfonic Acid, Sat'd	3	3	3	3	3	3	3	3	1	1	1	3	3	1	1	1						
Benzene Sulfonic Acid, 10%	3	3	3	3	3	3	3	3	1	2	3			2	1	2						
Benzenesulfonic Acid	3			3					3					2								
Benzenesulfonic Acid, 10%	1			1					1					1								
Benzine	1	1	1						2					1	1	1	1	1	1			
Benzochloride																						
Benzoic Acid, All	1	1	2	1		2			1	1	1	1	1	1	1	1	1	1	1	1		1
Benzoic Acid Crystals																						
Benzoic Sulfimide																						
Benzophenone																						
Benzotrichloride																						
Benzotrifluoride																						
Benzoyl Benzoic Acid																						
Benzoyl Chloride																						
Benzyl Acetate																						
Benzyl Alcohol	2			1					1	1	2			1	1	2				3		3
Benzyl Alcohol, 1,5%																						
Benzyl Benzoate																						
Benzyl Chloride					1																	
Beryllium Sulfate																						
Bismuth Carbonate	1				1				1					1								
Black Liquor	1				1				1					1								
Black Point 77																						
Blast Furnace Gas																						
Bleach, 12% Active Cl2				1					1					1								
Bleach, 5% Active Cl2	1			1					1					1								
Bleach Liquor																						

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Barium Bromide	1																				
Barium Carbonate, Sat'd	1			1					1					1						1	1
Barium Chloride, Sat'd	1			1					1		1			1						1	1
Barium Cyanide				1																	
Barium Hydroxide, 10%									1					1							
Barium Hydroxide, Sat'd	1			1					1					1						1	
Barium Nitrate, Sat'd	1			1					1					1						1	1
Barium Sulfate, Sat'd	1			1					1					1						1	1
Barium Sulfide, Sat'd	1			1					1					1						1	1
Bayol 35									3					1						1	3
Bayol D									3					1						1	3
Beer	1			1					1					1						1	1
Beet Sugar Liquors	1								1					1						1	1
Benzal Chloride				3																	
Benzaldehyde	3			3					1		1			3		3				3	3
Benzaldehyde, 1%	1																				
Benzaldehyde, 10%	1								1					3						3	3
Benzaldehyde, >10%																					
Benzaldehyde, 10%	1																				
Benzaldehyde, 5%	1																				
Benzalkonium Chloride	2																				
Benzamide				1																	
Benzene	2			3					3		3		3	1		2				3	3
Benzene Sulfonic Acid, Sat'd	1	1	2	1	1				3					1	1	1				2	3
Benzene Sulfonic Acid, 10%	3			1					3					1						3	3
Benzenesulfonic Acid	1			1					3					1							3
Benzenesulfonic Acid, 10%	1								3					1						3	3
Benzine									3					1	1	1				1	3
Benzochloride									1					1						3	3
Benzoic Acid, All	1			1					1		3			1	1	1	1	2		3	3
Benzoic Acid Crystals	1																				
Benzoic Sulfimide				1																	
Benzophenone									1					1							3
Benzotrichloride				3																	
Benzotrifluoride				3																	
Benzoyl Benzoic Acid				1																	
Benzoyl Chloride				2																	
Benzyl Acetate	2																				
Benzyl Alcohol	1								2					1						3	3
Benzyl Alcohol, 1,5%	2																				
Benzyl Benzoate														1						3	
Benzyl Chloride				3					3					3						3	
Beryllium Sulfate				1																	
Bismuth Carbonate	1			1					1					1						1	
Black Liquor	1			1					2					1						2	1
Black Point 77									1					1						1	2
Blast Furnace Gas									3					1						3	3
Bleach, 12% Active Cl2									1					1						3	3
Bleach, 5% Active Cl2									1					1						3	
Bleach Liquor									1					1						3	3

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Blood																						
Borax, Sat'd	1	1	2	1					1	1	1	1	1	1	1	1	1	1	2			
Bordeaux Mixture																						
Boric Acid, 10%	1		2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
Boric Acid, Sat'd	1		2	1					1	1	1	1	1	1	1	1	1	1		1	1	1
Boron Fluids (HEF)																						
Boron Trifluoride																						
Brake Fluid																						
Brine, Sat'd	1	1	1	1		1			1	1	1	1	1	1	1	1	1	1		1		
Brom-113																						
Brom-114																						
Bromic Acid	1			1					3					1								
Bromic Acid, 10%	1		1	1		1		1						1		1		1		1		1
Bromine, Aqueous																						
Bromine Liquid	3		3	3		3		3	3		3		3	1	1	1	1	1		3		3
Bromine Pentafluoride																						
Bromine Trifluoride																						
Bromine Vapor, 25%	1			1					3					1						3		
Bromine Water cold, Sat'd	3													1						3		
Bromoacetic Acid																						
Bromobenzene																						
Bromobutyric-2 Acid																						
Bromochloro																						
Bromoform																						
Bromosalicylic Acid, Sat'd																						
Bromotoluene	3													1								
Bunker Oil																						
Butadiene	1		1	1					1	1	1			1	1	1	1	1				
Butadiene, 50%	1			1					3					1								
Butadiene Gas	1			1					1					1						3		
Butanane-2,4-p-Methoxy																						
Butane, 50%	1			1					1					1						1		
Butane, Gas	1			1					1					1								
Butter - Animal Fat																				1		
Butyl Acetate	3		3	3		3		3	2					1	2					3		3
Butyl Acetyl Ricinoleate																						
Butyl Acrylate Pure	3			3					3					1								
Butyl Alcohol	1		2	1	1				1		1		2	1		1		2		2		
Butyl Benzoate																						
Butyl Bromide													1									
Butyl Butyrate																						
Butyl Carbitol																						
Butyl Cellosolve														1								
Butyl "Cellosolve" Adipate																						
Butyl Chloride				3																3		
Butyl Ether	3			3					3					1						3		
Butyl Glycolate																						
Butyl Mercaptan														1								
Butyl Oleate																						
Butyl Phenol	2		2	1					3		3			1		1						

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Blood														1						1	
Borax, Sat'd	1			1					1	1	1	1		1	1	1	1			1	1
Bordeaux Mixture									1					1						2	1
Boric Acid, 10%	1								1	1	1	1	1	1							
Boric Acid, Sat'd	1			1					1	1	1	1	1	1						2	1
Boron Fluids (HEF)									3					1						2	3
Boron Trifluoride	2																				
Brake Fluid									1					3							1
Brine, Sat'd									1	1	1	1	1	1	1	1	1	1		1	1
Brom-113									3												3
Brom-114									3					2						2	3
Bromic Acid				1					2					1							
Bromic Acid, 10%																					
Bromine, Aqueous				1																	
Bromine Liquid	3			3					3					1						3	3
Bromine Pentafluoride									3					3						3	3
Bromine Trifluoride									3					3						3	3
Bromine Vapor, 25%	1								3					1						3	3
Bromine Water cold, Sat'd	3								3					1							
Bromoacetic Acid				1																	
Bromobenzene	3								3					1							3
Bromobutyric-2 Acid	2																				
Bromochloro									3					1						3	
Bromoform	3			3																	
Bromosalicylic Acid, Sat'd	1																				
Bromotoluene	3													1							
Bunker Oil									3					1						1	3
Butadiene				1					2					2							
Butadiene, 50%	1								3					1						3	3
Butadiene Gas									3					1						3	3
Butanane-2,4-p-Methoxy	3																				
Butane, 50%	1			1					3					1						1	2
Butane, Gas														1							
Butter - Animal Fat									1					1						1	3
Butyl Acetate				1					1					2				3		3	3
Butyl Acetyl Ricinoleate									1					1						2	3
Butyl Acrylate Pure									3					3						3	3
Butyl Alcohol	1			1					2				1	1				2		1	1
Butyl Benzoate									1					1						3	3
Butyl Bromide																					
Butyl Butyrate									1					1						3	
Butyl Carbitol									1					1							
Butyl Cellosolve				1					2					3						3	
Butyl "Cellosolve" Adipate									2					2						3	
Butyl Chloride	3													1							
Butyl Ether				1										3							
Butyl Glycolate				1																	
Butyl Mercaptan																					
Butyl Oleate									2					1						3	
Butyl Phenol	1			2										2							

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Butyl Phthalate	3			3																		
Butylamine, Sat'd																						
Butylene, Liquid	2													2								
Butyric Acid	1								1	1	2											
Butyric Acid, pure	1								1	1	2			1	1	1	1	2				
Calcium Bisulfide	1	1	1	1					1	1	1			1	1	1				1	1	1
Calcium Bisulfite	1	1	1	1					1	1	1			1	1	1				1	1	1
Calcium Carbonate	1	1	1	1	1	1			1	1	1			1	1	1				1	1	1
Calcium Chlorate	1	1	1	1					1					1	1	1				1	1	
Calcium Chloride, Sat'd	1		2	1					1	1	1		2	1	1	1	1	1		1	1	1
Calcium Hydroxide, 30%	1	1	1	1					1	1	1			1	2	2						
Calcium Hydroxide, Sat'd	1	1	1						1	1	1	1		2								
Calcium Hypochlorite		2							1	1				1		1		2		1	1	1
Calcium Nitrate, Sat'd	1	1	1	1	1	1			1					1	1					1	1	1
Calcium Sulfate	1	1	1	1					1					1	1	1				1	1	1
Calcium Sulfide, Sat'd	1	1	1	1					1					1	1	1				1	1	1
Camphor Oil	1								3	3	3			1	1	1				3	3	3
Carbon Dioxide, Pure Anhydrous	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1	1	1	1
Carbon Dioxide, Pure Moist	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1	1	1	1
Carbon Disulfide	2		3	3		3		3	1		3		3	1	1	1	1	1		3	3	3
Carbon Monoxide, Gas	1	1	1	1					1	1	1			1	1	1				1	1	1
Carbon Tetrachloride	2		3	1					3	3	3			1	1	1				3	3	3
Carbonic Acid, Sat'd	1	1	1	1										1	1	1						
Caustic Potash, 50%	1	1	2						1	1	1	1	1									
Caustic Soda, 10%	1	1	2						1	1	1	1	1									
Caustic Soda, 50%	1	1	1						1	1	1	1	1									
Caustic Soda, up to 40%	1	1	2						1	1	1	1	1									
Chloral Hydrate, All									2													
Chloramine (Diluted)	1			1					1					1								
Chloric Acid, 10%	1	1	2											1	1							
Chloric Acid, 20%	1	1	2	1					1		3	3	3	1	1	1	1	1				
Chlorinated Water, 0.3%(Sat'd)	1	1	1	1	1	1	1		2					2								
Chlorine, Liquid	3								3	3	3			1	1	1				3	3	3
Chloroacetic Acid, 50%	1	1	2						1	1	1											
Chlorobenzene, Dry	3	3	3	3	3				3	3	3			1		2				3	3	3
Chloroform, Dry	3	3		3	3	3	3	3	2		3		3	1	1	1	1	1		3	3	3
Chlorosulfonic Acid	2		3						3	3	3	3	3	2		3		3				
Chrome Alum	1	1	2	1	1	1	1	1	1	1	1		2	1	1							
Chromic Acid, 10%	1		2	1	1	1	1	1	1		2		3	1		1		3		2		3
Chromic Acid, 30%	1		2	1	1	1	1	1	2		3		3	1		1		2		3	3	3
Chromic Acid, 50%	1	1	2	1				2	2		3	3	3	1	1	1	1	2	2	3	3	3
Cider	1			1					1					1	1	1						
Coconut Oil	1	1	2						1	1	1			1	1	1	1	1	1			
Compressed Air	2								2					1	1	1						
Copper Chloride, Sat'd	1		1	1	1	1	1	1	1	1	1			1	1	1	1	1		1		
Copper Cyanide	3	3	3	1					1	1	1			1	1	1				1	1	1
Copper Fluoborate	1	1	1	1					3	3	3			1	1	1				1	1	1
Copper Nitrate, 30%	1		2	1					1	1	1			1	1	1				1	1	1
Copper Salts	1	1	2						1	1	2			1	1	1	1	1				

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Butyl Phthalate																					
Butylamine, Sat'd																					
Butylene, Liquid									2					1							
Butyric Acid																					
Butyric Acid, pure									2					2							
Calcium Bisulfide									1					1							
Calcium Bisulfite									1					1							3
Calcium Carbonate									1					1							
Calcium Chlorate														1							1
Calcium Chloride, Sat'd									1					1	1	1	1	1			1
Calcium Hydroxide, 30%									1					1							
Calcium Hydroxide, Sat'd									1	1	1	1		1	1	1	1	1			1
Calcium Hypochlorite									1					1							3
Calcium Nitrate, Sat'd																					1
Calcium Sulfate									1					1							
Calcium Sulfide, Sat'd									1												1
Camphor Oil														1							
Carbon Dioxide, Pure Anhydrous	1	1	1	1	1	1			1	1	1	1	2	1	1	1	1	1		1	1
Carbon Dioxide, Pure Moist	1	1	1	1	1	1			1	1	1	1	2	1	1	1	1	1		1	1
Carbon Disulfide									3	3	3	3	3	1							3
Carbon Monoxide, Gas									3	3	3	3	3	1							1
Carbon Tetrachloride									3					1	1	1					3
Carbonic Acid, Sat'd																					1
Caustic Potash, 50%									1	1	1	2									1
Caustic Soda, 10%									1	1	1			2	2	2					1
Caustic Soda, 50%									1	1	1			2							
Caustic Soda, up to 40%									1	1	1			2							
Chloral Hydrate, All									2					2							
Chloramine (Diluted)									1					1							
Chloric Acid, 10%									1	1	1										
Chloric Acid, 20%									1	1	1	1	1	1				3			
Chlorinated Water,0.3%(Sat'd)	1	1	1	1	1	1	1	1	1					1						1	1
Chlorine, Liquid									3					1							
Chloroacetic Acid, 50%									2												3
Chlorobenzene, Dry									3	3	3			1							3
Chloroform, Dry									3	3	3	3	3	2							3
Chlorosulfonic Acid									3		3		3	2							3
Chrome Alum									1	1	1	1		1	1	1	1	1	1		3
Chromic Acid, 10%									1					1							3
Chromic Acid, 30%									1		3		3	1							
Chromic Acid, 50%									2	2	2			1	1	1					3
Cider	1								1					1							
Coconut Oil														1	1	1					3
Compressed Air	1	1												1							
Copper Chloride, Sat'd									1					1							1
Copper Cyanide																					1
Copper Fluoborate														1							
Copper Nitrate, 30%									1					1	1	1					
Copper Salts	1	1	1					1	1	1	1		1	1	1	1					1

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Copper Sulfate, Sat'd	1	1	1	1	1	1			1	1	1			1	1	1				1	1	1
Cottonseed Oil	1	1	1	1					1	1	1			1	1	1				1	1	1
Creosols	2		3	2		3			1					1	1	1				1	1	1
Creosylic Acid	2		3	1										1		2						
Cresol, 50%	2		3	2		3			1					1	1	1				1	1	1
Cresol, 90%	3	3	3	3	3	3			2					1	1	1				3		
Cyclohexane	3	3	3	3	3	3			1		2			1	1	1	1	2				
Cyclohexanol	1	1	1						1	1	2			1	1	2	2					
Cyclohexanone	3	3	3	3	3	3	3	3	1	2	3	3	3	1	2	2		3		3	3	3
Decahydronaphthalene	1	1	1						3	3	3			1	1	1						
Detergent, Water Solution	1	1	2						1	1	1	1		1	1	1	1	1				
Di(Butoxyethyl) Phthalate	3	3	3	3	3	3			3	3				1								3
Dibutyl Phthalate									1	2	2			1	1	2						
Dibutyl Sebacate									1					1								
Dichloro Ethane	3	3		3					1					1	1	1				3	3	3
Dichlorobenzene									2					1	1	1	2					
Dichloroethylene	3	3	3						2					1	1	1						
Diethyl Ether	3	3	3	3	3	3			1	1	1			1		3						
Diglycolic Acid, Sat'd	1	1	2						1	1	1			1								
Diisobutyl Ketone									1					1	1	2						
Dimethylamine	2		3						1		2			2		3						
Dimethylformamide	2								1					2								
Dinonyl Phthalate									1													
Dioctyl Phthalate	3	3	3						1	2	2											
Dioxane									2	2	2											
Ethers	3	3	3	3	3	3			3	3	3											
Ethyl Acetate	3	3	3	3	3	3	3	3	1	2	2	3	3	2	2	2		3		3	3	3
Ethyl Alcohol	1	1	2	1					1	1	1	1	1	1	1	1	1	1		3	3	3
Ethyl Benzene									2					1								
Ethyl Ether	3	3	3	3	3	3			3	3	3			1								
Ethylene Chloride									2					1	1	1	1	2				
Ethylene Chlorohydrin	3	3	3	3	3	3								1		2		3				
Ethylene Diamine	2								1					2	2							
Ethylene Glycol, 100%	1	1	1	3					1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ethylene Glycol, 50%				1	1	1	1															
Ethylene Oxide									2					1	1	1	2					
Fatty Acids	1	1	1	1	1	1			1	1	1			1	1	1	1			1	1	1
Fatty Alcohol Sulfamate	1	1	2						1	1	2			1	1	1	1	1				
Ferric Chloride	1		2	1					1	1	1			1	1	1				1	1	1
Ferric Chloride, Sat'd	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	
Ferric Nitrate, Sat'd	1	1	1	1										1	1	1				1	1	1
Ferric Sulfate	1	1	1	1					1					1	1	1				1	1	1
Ferrous Chloride, Sat'd	1	1	1	1	1	1			1					1	1	1				1	1	1
Ferrous Sulfate	1	1	1	1					1					1	1	1				1	1	1
Fluorine Gas (Dry), 100%	2		3						3	3	3			1								
Fluosilicic Acid, 30%	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1				3
Formaldehyde	1		2	1				2	1	1	1			1	1	1	1	1		1	1	1
Formamide									1	1	1											
Freon 12, 100%	1													2								
Fruit Juice, Pure	1	1	1						1	1	1	1	1	1	1	1	1	1				

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Copper Sulfate, Sat'd									2					1	1	1					1
Cottonseed Oil									1					1	1	1					
Creosols									3	3	3			1							3
Creosylic Acid											2			1	1	1					3
Cresol, 50%									3	3	3			1							3
Cresol, 90%									3	3	3			2							
Cyclohexane	1	1	1						3	3	3			1							3
Cyclohexanol	1	1	1											1							3
Cyclohexanone	1	2	2						3	3	3	3	3								
Decahydronaphthalene									3	3	3			1							3
Detergent, Water Solution		1	1	1						1	1	1			1	1	1				
Di(Butoxyethyl) Phthalate									1					2							1
Dibutyl Phthalate	1	2	2						2					2							3
Dibutyl Sebacate	1								1					1							3
Dichloro Ethane														3							
Dichlorobenzene	2													1							3
Dichloroethylene									1					1							
Diethyl Ether									1					1							3
Diglycolic Acid, Sat'd	1	1	1						1					1	1	1					
Diisobutyl Ketone	1								2												
Dimethylamine									3					2							
Dimethylformamide	1		2						2												3
Dinonyl Phthalate	2								2					1							
Dioctyl Phthalate	2								2					1							3
Dioxane	1	1	1						1												3
Ethers									2		3										3
Ethyl Acetate	1	2	2						1		3		3	3		3		3			3
Ethyl Alcohol	1	1	1						1	1	1	1		1	1	1	1	1			1
Ethyl Benzene														2							3
Ethyl Ether									2		3			3	3	3					3
Ethylene Chloride	2								2	2				1	1	2					1
Ethylene Chlorohydrin									3		3										1
Ethylene Diamine	1	1	1						1	1	1			2	2						
Ethylene Glycol, 100%	1	1	1	1					1	1	1			1	1	1	2				1
Ethylene Glycol, 50%																					1
Ethylene Oxide									2												3
Fatty Acids												1									3
Fatty Alcohol Sulfamate	1	1	1						1	1	1			1	1	1					
Ferric Chloride									1	1	1			1							
Ferric Chloride, Sat'd									1	1	1	1	1	1							1
Ferric Nitrate, Sat'd														1							1
Ferric Sulfate									1					1							1
Ferrous Chloride, Sat'd									1												
Ferrous Sulfate									1					1							
Fluorine Gas (Dry), 100%																					
Fluosilicic Acid, 30%									2					1							
Formaldehyde									1					1				3			2
Formamide	1	1	1						1					1							
Freon 12, 100%									2					2							1
Fruit Juice, Pure	1	1	1						1	1	1	1	1	1	1	1	1	1			

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Furfuryl Alcohol									1		2			1	1	2						
Gasoline	1	1	2	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	3	3	3
Gelatin	1	1	1	1		3			1	1	1			1	1	1	1					
Glucose	1	1	2	1					1	1	1	1	1	1	1	1	1	1		1	1	1
Glycerine	1	1	1						1	1	1	1	1	1	1	1	1	1	1			
Glycine, Aqueous	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Glycolic Acid, Sat'd	1								1					1	1	1	1	1				
Heptane	1		2	1					1		2			1	1	1	1	1		1		
n-Hexane	1		2	1					1		2			1	1	1	1	1				
Hydrazine Hydrate	1			3	3	3	3	3	1	1	1											
Hydrobromic Acid, 50%	1	1	1						1	1	1			1	1	1	1	1				
Hydrochloric Acid, 10%	1	1	2						1	1	2	2		1	1	1	1	1	1			
Hydrochloric Acid, 25%	1		2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		2	2	2
Hydrochloric Acid, 36%	1	1	2						1	2				1	1	1	1	1				
Hydrochloric Acid, 37%	1	1	1	2		1		1	1	1	1		2	2	1	1	1	1		1		3
Hydrocyanic Acid	1	1	2						1	1	1			1	1	1	1					
Hydrofluoric Acid, 10%	1		2	1		2			1	1	1		3	1	1	1	1	1				
Hydrofluoric Acid, 60%	2		3	1		2			1		3		3	1	1	1	1	1		3	3	3
Hydrogen Peroxide, 30%	1	1	1	1	1	1	1	1	2	3	3	3	3	1	1	1				1	1	1
Hydrogen Sulfide, Dry	1		2						1	1	1			1	1	1						
Hydroxylamine Sulfate	1	1	1						1	1	1			1	1	1						
Iodine									1					1	1	1						
Isobutane	1								2		3			1	1	1						
Isooctane	1								1		2			1	1	1	1	1				
Isopropyl Acetate	1								1	1	1	1	1	1	1	1	2					
Isopropyl Alcohol			2						1	1	1			1								
Isopropyl Ether	2		3						2		3			1	1	1						
Lactic Acid, 10%	1	2							1	1	1	1	1	1	1	2	2					
Lanolin	1	2							1	1	1			1	1	1	1	1		1	1	1
Lead Acetate, Sat'd	1	1	1	1	1	1	1	1	1		2	2	2	1	1	1	1	1				
Linseed Oil	1	1	2	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1		1		3
Liqueurs	1	1							1					1	1	1	1					
Magnesium Carbonate	1		1	1					1	1	1			1	1	1				1	1	1
Magnesium Chloride, Sat'd	1	1	1	1	1	1	1	1	1	1	1		2	1	1	1	1	1		1	1	1
Magnesium Hydroxide	1	1	1	1	1	1	1		1	1	1	1		1	1	1	1	1	1	1	1	1
Magnesium Nitrate	1	1	1	1					1	1	1			1	1	1				1	1	1
Magnesium Salts	1	1	2						1	1	1	1	1	1	1	1	1	1	1			
Malic Acid	1			1					1		1			1	1	1						
Mercuric Chloride, Sat'd	1	1	1	1					1	1	1			1	1	1						
Mercuric Cyanide, Sat'd	1	1	1	1					1	1	1			1	1	1						
Mercurous Nitrate, Sat'd	1	1	1	1					1	1	1			1	1	1						
Mercury	1	1	1	1					1	1	1			1	1	1						
Mercury Salts	1	1	2						1	1	1			1	1	1	1	1	1			
Methane	1								1					1	1	1						
Methyl Acetate									1	1	1			1	2					3	3	3
Methyl Alcohol	1	1	1	1					1		2		2	1		1		1		3	3	3
Methyl Amine	2		3						1		2			2								
Methyl Bromide	3								3	3	3			1	1	1						
Methylene Chloride	3		3	3	3	3	3	3	3		3		3	1		2		3				
Methylsulfuric Acid	1		2	1					3		3		3									

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
°F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Furfuryl Alcohol	1	1	1						2												
Gasoline	1	1	1						3	3	3	3	3	1	1	1	1	1	1	1	3
Gelatin	1	1	1						1	1				1	1						1
Glucose									1	1	1	1		1	1	1	1	1			1
Glycerine	1	1	1						1	1	1	2	2	1	1	2		2			1
Glycine, Aqueous									1					1	1	1	1	1			
Glycolic Acid, Sat'd	1	1	1						1					1							
Heptane	1		2						1	1	1			1	1	1					3
n-Hexane	1		2						3					1	1	1					3
Hydrazine Hydrate	1	1	1						1					1							
Hydrobromic Acid, 50%	1	1	1						1	1	2			1	1	1	2				
Hydrochloric Acid, 10%	1	1	1						1	1	1	1		1	1	1	1				
Hydrochloric Acid, 25%									1	1	1		3	1	1	1	1	1			
Hydrochloric Acid, 36%	1	1	1						1	1	1	1		1	1	1	1				
Hydrochloric Acid, 37%									1		2		3	1				2			1
Hydrocyanic Acid	1	1	1						1	2				1	2						
Hydrofluoric Acid, 10%									1		3			1							
Hydrofluoric Acid, 60%									2					1				2			
Hydrogen Peroxide, 30%	2	3	3	2	3	3	3	3	2					1	1	2					
Hydrogen Sulfide, Dry									1					1							1
Hydroxylamine Sulfate	1	1	1						1	1				1	1						3
Iodine	1		2						1					1							1
Isobutane														3	3	3					
Isooctane	1		2											1							
Isopropyl Acetate	1	1	1						1	1	1	2		1	1	1	2				3
Isopropyl Alcohol														1	1	1					1
Isopropyl Ether	2													3	3	3					3
Lactic Acid, 10%	1	1	1						2	2	2			1	2	2	2				
Lanolin	1	1	1						2					1	1	1					
Lead Acetate, Sat'd	1	1	1						1	1	1			1	1	1	1	1			
Linseed Oil	1	1	1						2					1	1	1	1	1			3
Liqueurs	1	1							1	1	1			1							
Magnesium Carbonate									1					1							1
Magnesium Chloride, Sat'd									1					1							1
Magnesium Hydroxide	1	1	1	1	1	1			1	1	1	1		1	1	1	1	1		1	1
Magnesium Nitrate									1					1							1
Magnesium Salts	1	1	1						1	1	1	1		1	1	1	1	1			1
Malic Acid									3					1							1
Mercuric Chloride, Sat'd																					1
Mercuric Cyanide, Sat'd																					
Mercurous Nitrate, Sat'd																					
Mercury	1	1	1						1	1	1			1	1	1	1				1
Mercury Salts	1	1	1						1	1	1			1	1	1					
Methane	1													1							3
Methyl Acetate	1								2		3										
Methyl Alcohol									1					2		2		2			1
Methyl Amine	1								1					1							
Methyl Bromide	2													2							
Methylene Chloride	2													2							3
Methylsulfuric Acid									1				3	2				3			

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Milk	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Molasses	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Morpholine									1	1	1			1	1	2						
Naphtha	2		3	1					1		3			1		1						
Naphthalene									1					1	1	2						
Nickel Chloride, Sat'd	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Nickel Nitrate	1	1	1	1					1	1	1		2	1	1	1	1	1		1	1	1
Nickel Sulfate, Sat'd	1	1	1	1					1	1	1			1	1	1				1	1	1
Nitric Acid, 100%														2								
Nitric Acid, 40%	1	1	1	1	1	1	1	1	2		3		3	1	1	1	1	1		3	3	3
Nitric Acid, 60%	1		2	1	1	1	1	1	2		3		3	1	1	1	1	1				
Nitric Acid, 65%	2	2												1	1	1	2					
Nitrobenzene	3	3	3	3	3	3			1		2			1	1	1				3	3	3
Oleic Acid	1	1	1	1					1	1	2			1	1	1	1	1		1		2
Oleum																						
Olive Oil	1	1	2						1	1	1	1		1	1	1	1					
Oxygen Gas	1	1	1	1	1	1			3	3	3			1	1	1				1	1	1
Ozone	1	1	2	1					2	3	3			1	1	1	2					
Palmitic Acid	1								2					1	1	1	1	1	1			
Palmitic Acid, 10%	1	1	1	1							3			1	1	1						
Palmitic Acid, 70%	1	1	1	1							3			1	1	1						
Paraffin			2								1			1	1	1				2	2	2
Paraffin Emulsion	1	1	1	1					1	1	2			1	1	1	1	1				
Perchloric Acid, 10%	1	1	2						1	1	1			1	1	1	1	1				
Perchloric Acid, 70%	1		2						1					1	1	1	1	1				
Perchloroethylene									2					1	1	1	2	2				
Petroleum	1								1	2	2			1	1	1	1	1	1			
Phenol, 90%	1	2							1	1	1			1	1	2						
Phenyl Hydrazine	3	3	3	3	3	3			2	2	2			1	1	1						
Phosgene Gas	1	2	2						2					1	1							
Phosgene Liquid									2													
Phosphoric Acid, 25%	1		2	1				2	1	1	1	1	1	1	1	1	1	1				
Phosphoric Acid, 30%	1	1	2						1	1	1	1		1	1	1	1	1				
Phosphoric Acid, 50%	1	1	1	1				2	1	1	1	1	1	1	1	1	1	1				
Phosphoric Acid, 85%	1	1	1	1				2	1	1	1	1	1	1	1	1	1	1				
Phosphorous Pentoxide	1	1							1					1	1	1	1	1				
Phosphorous Trichloride	3	3	3	3	3	3			1		2			1	1	1						
Phosphorus Oxychloride									1		2											
Phosphorus Pentachloride									1		2											
Potassium Bicarbonate	1	1	2						1	1	1	1	1	1	1	1	1	1				
Potassium Borate	1	1	2						1	1	1			1	1	1				1	1	1
Potassium Bromate	1	1	2	1					1	1	1	1	1	1	1	1	1	1	1			
Potassium Bromide	1	1	2						1	1	1			1	1	1	1	1	1			
Potassium Carbonate	1	1	1						1					1		2				1	1	1
Potassium Chlorate	1	1	1						1	1	1			2								
Potassium Chloride	1	1	1						1	1	1	1	1	1	1	1	1	1	1			
Potassium Chromate	1	1	1						1	1	1			1	1	1	1	1				
Potassium Cyanide	1	1	1						1	1	1			1	1	2						
Potassium Ferricyanide	1	1	1	1					1	1	1		2	1	1	1	1	1		1	1	1
Potassium Fluoride									1	1	1			1	1	1						

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Milk									1					1							1
Molasses	1	1	1						1	1	1	1	1	1	1	1	1	1			
Morpholine	1	1	1						2					2							
Naphtha									3					1		1					3
Naphthalene	1		2											1	1	1					3
Nickel Chloride, Sat'd									1												1
Nickel Nitrate									1					1							1
Nickel Sulfate, Sat'd									1					1	1	1					1
Nitric Acid, 100%																					3
Nitric Acid, 40%									1				3	1				3			3
Nitric Acid, 60%									3	3	3	3	3	2	3	3	3	3			3
Nitric Acid, 65%	2													1	2						3
Nitrobenzene									3	3	3			2	3	3					3
Oleic Acid	1	1	2						2					1	2						3
Oleum														2							3
Olive Oil	1	1	2						2					1	1	1	1				
Oxygen Gas									1					1							3
Ozone	2								1	2				1	2						3
Palmitic Acid	2								2					1	2						1
Palmitic Acid, 10%									2					1	1	1					1
Palmitic Acid, 70%																1					1
Paraffin														1							
Paraffin Emulsion	1	1	2											1	1	1	2				
Perchloric Acid, 10%	1	1	1						1	1	1	2		1	1	1	2				
Perchloric Acid, 70%	1	1	1						1	1	1	2		1	1	1	2				
Perchloroethylene	2													1	1	1					3
Petroleum	1	1	2																		
Phenol, 90%	1	1	2											1	2						
Phenyl Hydrazine	2								2					1	1	2					
Phosgene Gas	2								1	1	1			1	1	2					
Phosgene Liquid									1					1							
Phosphoric Acid, 25%									1	1	1	1	1	1	1	1	1	1			3
Phosphoric Acid, 30%	1	1	1						1	1	1	1	2	1	1	1	1	1			3
Phosphoric Acid, 50%	1	1	1						1	1	1	2	2	1	1	1	1	2			3
Phosphoric Acid, 85%	1	1	2						1	1	1	2		1	1	1	1	2			3
Phosphorous Pentoxide	1	1							1	1	1			1	1	1					
Phosphorous Trichloride														1							3
Phosphorus Oxychloride	1		2						1					1							
Phosphorus Pentachloride	1		2						1					1							
Potassium Bicarbonate	1	1	1						1	1	1			1	1	1					
Potassium Borate	1	1	1						1	1	1			1	1	1					
Potassium Bromate	1	1	2						1	1	1	1	1	1	1	1	1	1			1
Potassium Bromide	1	1	1						1	1	1	1	1	1	1	1	1	1			1
Potassium Carbonate														1							1
Potassium Chlorate	1	1	1						1	1	1	1		1	1	1	1	1			1
Potassium Chloride	1	1	1						1	1	1	1	1	1	1	1	1	1			1
Potassium Chromate	1								1	1	1			1	1	1					1
Potassium Cyanide	1	1	1						1	1	1	1		1	2						1
Potassium Ferricyanide									1					1	1	1	1	1			1
Potassium Fluoride																					1

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Potassium Iodide	1	1	1						1	1	1			1	1	1	1	1				
Potassium Nitrate	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1		1	1	1
Potassium Perborate	1	1	1	1					1					1	1	1						
Potassium Perchlorate	1	1	2						1	1	1			1	1	1	1					
Potassium Permanganate, Sat'd	1	1	2	1	1	1	2		1	1	2			1	1	1	1	1		1	1	1
Potassium Permanganate, 10%	1	1	2	1	1	1	1		1	1	1	1		1	1	1	1	1	1			
Potassium Persulfate	1	1	2	1					1	1	1			1	1	1	1					
Potassium Sulfate	1	1	2						1	1	1			1	1	1	1	1		1	1	1
Propane	1			1					1					1	1	1				1	1	1
1-Propanol	1	2	2						1	1	1			1	1	1	2					
Propargyl Alcohol	1	1	1						1	1	1			1	2	2						
Propionic Acid, 50%	1	1	2						1	1	1			1	1	1						
Propyl Alcohol	1		2	1					1	1	1			1	1	1						
Propylene Oxide	2								1					1	2							
Pyridine	3	3	3	3	3	3			2	2	2			1		3						
Sea Water	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Silicic Acid	1	1	1	1					1	1	1			1	1	1						
Silicone Oil	1	1	3						1	1	1			1	1	1	1	1		1	1	1
Silver Cyanide	1	1	1	1					1	1	1			1	1	1				1	1	1
Silver Nitrate	1		2	1	1	1	1	1	1	1	1		2	1	1	1	1	1		1	1	1
Soaps	1	1	2	1					1	1	1			1	1	1	1	1		1	1	1
Sodium Acetate, Sat'd	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2				
Sodium Benzoate	1	1	2						1	1	1			1	1	1	1	2				
Sodium Bicarbonate	1	1	1						1	1	1	1		1	1	1	1	2				
Sodium Bichromate, Sat'd	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Sodium Bisulfate	1	1	2						1	1	1			1	1	1	1	1				
Sodium Bisulfite	1	1	1	1	1	1	1	1	1	1	1		2	1	1	1	1	1		1	1	1
Sodium Bromide Sat'd	1	1	1	1					1	1	1			1	1	1				1	1	1
Sodium Chlorate, Sat'd	1		2	1					1	1	1			1	1	1				1	1	1
Sodium Chloride	1	1	2	1	1	1			1	1	1	1		1	1	1	1	2		1	1	1
Sodium Chromate	1	1	2						1	1				1	1	1	1	1				
Sodium Ferrocyanide, Sat'd	1	1	1	1																		
Sodium Fluoride	1	1	1	1					1					1	1	1	1	1				
Sodium Hypochlorite	1		2	1					1					1	1	1						
Sodium Iodide	1	1	2						1					1	1	2						
Sodium Nitrate, Sat'd	1	1	1	1					1	1	1			1	1	1	1	1	1	1	1	1
Sodium Nitrite, Sat'd	1								1					1	1	1	1	1	1			
Sodium Oxalate	1	1	2						1					1	1	2						
Sodium Perborate	1	1	1	1	1	1	1	1	1					1	1	1				1	1	1
Sodium Phosphate	1	1	2						1	1	1	1	1	1	1	1	2					
Sodium Sulfate, Sat'd	1	1	1	1					1	1	1	1		1	1	1	1	1	1	1	1	1
Sodium Sulfide	1	1	2	1					1	1	1			1	1	1	1	1		1	1	1
Sodium Sulfite	1	1	1	1					1	1	1			1	1	1	1	1		1	1	1
Sodium Thiosulfate	1	1	2						1	1	1			1	1	1	1	1				
Stannous Chloride, 15%	1	2	2						1	1	1			1	1	1	1	1				
Stearic Acid, 100%	1	1	1	1	1	1			1	2	2			1	1	1	1	1				
Succinic Acid	1	1	1						1	1	1			1	1	1						
Sugar Syrup	1	1	2	1					1	1	1	1		1	1	1	1	1				

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Potassium Iodide	1	1	1						1	1	1			1	1	1	1				1
Potassium Nitrate	1	1	1						1					1							1
Potassium Perborate									1					1							1
Potassium Perchlorate	1	1	1						1	1	1			1	1	1	1				1
Potassium Permanganate, Sat'd	1	1	2						1	1	1			1	1	1	1	1		2	1
Potassium Permanganate, 10%									1	1	2			1	1	1				3	1
Potassium Persulfate	1	1	1						1	1	1	1		1	1	1	1				1
Potassium Sulfate	1	1	1						1	1	1	1		1	1	1	1	1			1
Propane	1								1					1							3
1-Propanol	1	1	1						1	1	1			1	1	1					
Propargyl Alcohol	1	1	1						1	1	1			1	1	1					
Propionic Acid, 50%	1	1	1						1	1	1			1	1	2					
Propyl Alcohol									1					1	1	1					1
Propylene Oxide	2								1												3
Pyridine									3	3	3			3	3	3					3
Sea Water									1	1	1	1	1	1	1	1	1	1			1
Silicic Acid									1	1	1			1							
Silicone Oil	1	1	1						2					1	1	1					1
Silver Cyanide														1							
Silver Nitrate									1					1				2			1
Soaps	1	1	1						1	1	1	2		1	1	1	2				1
Sodium Acetate, Sat'd	1	1	1						1	1	1	2		1	1	1	2				3
Sodium Benzoate	1	1	1						1	1	1	2		1	1	1	2				
Sodium Bicarbonate	1	1	1						1	1	1	1		1	1	1	1				1
Sodium Bichromate, Sat'd									1					1							
Sodium Bisulfate	1	1	1						1	1	1	2		2							1
Sodium Bisulfite	1	1	1						1	1	1	2		2							1
Sodium Bromide Sat'd									1					1							
Sodium Chlorate, Sat'd									1					1		1					
Sodium Chloride	1								1	1	1			1	1	1					1
Sodium Chromate	1								1	1	1			1	1	1					
Sodium Ferrocyanide, Sat'd									3					3							
Sodium Fluoride	1								1	1	1			1	1	1					1
Sodium Hypochlorite																					3
Sodium Iodide	1								1	1	1			1	1	1					
Sodium Nitrate, Sat'd	1	1	1						1	1	1			1	1	1					1
Sodium Nitrite, Sat'd	1								1	1	1			1	1	1					1
Sodium Oxalate	1								1					1							
Sodium Perborate									1					1							1
Sodium Phosphate	1	1	1						1	1	1			1	1	1					1
Sodium Sulfate, Sat'd	1	1	1						1	1	2			1	1	1	1				1
Sodium Sulfide	1	1	1						1	1	1			1							1
Sodium Sulfite	1	1	1						1	1	1			1	1	1					1
Sodium Thiosulfate	1	1	1						1	1	1			1	1	1					1
Stannous Chloride, 15%	1	1	1						1	2				1	1	1					1
Stearic Acid, 100%	1		2						1	1	2			1	1	2					1
Succinic Acid	1	1	1						1	1	1			1	1	1	1				
Sugar Syrup	1	1	1						1	1	1	1		1	1	1	1				

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PVC			CPVC					PP					PVDF						ABS		
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	40	60
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	104	140
Sulfur Dioxide Gas, Dry	1	1	1	1					1	1	1		3	1	1	1	1	1		1	1	1
Sulfur Dioxide Gas, Wet	2		3																	1		
Sulfur Dioxide Liquified																						
Sulfuric Acid, 51% to 60%	1	1	1						1	1	1			1	1	1	1	1	2			
Sulfuric Acid, 71% to 80%	1	1	1						1	1	2			1	1	1	1	1	2			
Sulfuric Acid, 96%	1	1	2	1		3		3	3	3	3	3	3	1	2	2		3		3	3	3
Sulfuric Acid, 97%														2								
Sulfurous Acid	1	1	2						1	1	1			1	1	1	1	1				
Tannic Acid	1								1	1	1			1	1	1	1	1				
Tartaric Acid	1	1	2	1					1	1	1			1	1	1	1	1	1			
Tetrachloroethane	3	3	3						2		3			1	1	1	2					
Tetraethyl Lead	1		2	1					1													
Tetrahydrofuran	3	3	3	3	3	3	3	3	2		3		3	1		2		3				
Thionyl Chloride	3			3					3					2								
Toluene	3	3	3	3	3	3	3	3	2	3	3	3	3	1	1	2				3	3	3
Transformer Oil	1		2						1		2									1	1	1
Tributyl Phosphate									1	1	1			1								
Trichloroacetic Acid	2								1	1	1			2								
Trichloroacetic Acid, 50%	1	2	3						1	1	1			1	1	2						
Trichloroethylene	3	3	3	3	3	3			3	3	3			1	1	1				3	3	3
Tricresyl Phosphate									1		2											
Triethanolamine	2		3	2					1					1	3	3				1	1	1
Triethylamine														2								
Trioctyl Phosphate									1													
Turpentine	1	2												1								
Urea	1	1	2						1	1	1			1	1	1	1	2				
Urea, 30%																						
Uric Acid	1		2	1		2														1		
Urine	1	1	2	1					1	1	1			1	1	1	1	1		1	1	1
Vaseline	1		3						1		2			1	1	1						
Vegetable Oil	1	2							1	1	2			1	1	1	1	1				
Vinegar	1	1	1						1	1	1	1		1	1	1	1	1				
Vinyl Acetate	3	3	3	3	3	3			1					2								
Vinyl Chloride														1	1	1	1					
Water, Deionized	1	1	1						1	1	1	1	1	1	1	1	1	1	1			
Whiskey	1	1	1	1					1					1	1	1				1	1	1
Wines	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1	1		1	1	1
Xylene									1	1	2											
Yeast	1	1							1	1	1			1	1	1	1					
Zinc Chloride	1	1	1	1					1	1	1			1	1	1				1	1	1
Zinc Nitrate	1	1	1	1					1	1	1			1	1	1				1	1	1
Zinc Salts	1	1	2						1	1	1			1	1	1	1	1	1			
Zinc Sulfate	1	1	1	1					1	1	1			1	1	1				1	1	1

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

CHEMICAL RESISTANCE CHART

Chemicals	PE			PEX					EPDM					FPM (FKM)						BUNA-N	SBR
Temp. °C	20	40	60	20	40	60	80	100	20	40	60	80	100	20	40	60	80	100	120	20	20
Temp. °F	68	104	140	68	104	140	176	212	68	104	140	176	212	68	104	140	176	212	248	68	68
Sulfur Dioxide Gas, Dry									1					1	1	1	1	1			1
Sulfur Dioxide Gas, Wet														1							3
Sulfur Dioxide Liquified									2					2							
Sulfuric Acid, 51% to 60%	1	1	1						1	1	2			1	1	1	2				3
Sulfuric Acid, 71% to 80%	1	1	2						1	2				1	1	2					3
Sulfuric Acid, 96%									2		3		3	1							3
Sulfuric Acid, 97%																					3
Sulfurous Acid	1	1	1						1	2				1	1	2					1
Tannic Acid	1	1	1						1	2				1	1	2					1
Tartaric Acid	1	1	1						1	2				1	1	1					1
Tetrachloroethane	2													2							3
Tetraethyl Lead									1					1							3
Tetrahydrofuran									3					2							3
Thionyl Chloride									3					1							3
Toluene	2								3	3	3	3	3	2							3
Transformer Oil									3					1							3
Tributyl Phosphate	1	1	1						1												3
Trichloroacetic Acid	1	1	1						2												3
Trichloroacetic Acid, 50%	1	1	1						2					3	3	3					
Trichloroethylene									3	3	3			1							3
Tricresyl Phosphate	1	1	1																		3
Triethanolamine	1	1	1						2					1							1
Triethylamine																					3
Trioctyl Phosphate	2																				
Turpentine	2	2	2											1	1	1					3
Urea	1	1	1						1	1	1			1	1	1					
Urea, 30%																					
Uric Acid																					
Urine	1	1	1						1	1	1			1	1	1					
Vaseline									3	3	3			1							
Vegetable Oil	1	2												1	1	1					3
Vinegar	1	1	1						1	2				2							1
Vinyl Acetate									1		3		3	1							
Vinyl Chloride									2												
Water, Deionized	1	1	1						1	1	2			1	1	1	1	1	1		1
Whiskey									1					1							1
Wines									1					1							1
Xylene														1	2						3
Yeast	1	1	1						1	1				1	1						
Zinc Chloride									1					1							1
Zinc Nitrate									1					1							1
Zinc Salts	1	1	1						1	1	1			1	1	1					
Zinc Sulfate									1					1							1

1 - High Resistance 2 - Limited Resistance 3 - No Resistance

NOTES:

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