CPVC Chemical Resistance Guide

FIRST EDITION

CPVC CHEMICAL RESISTANCE GUIDE

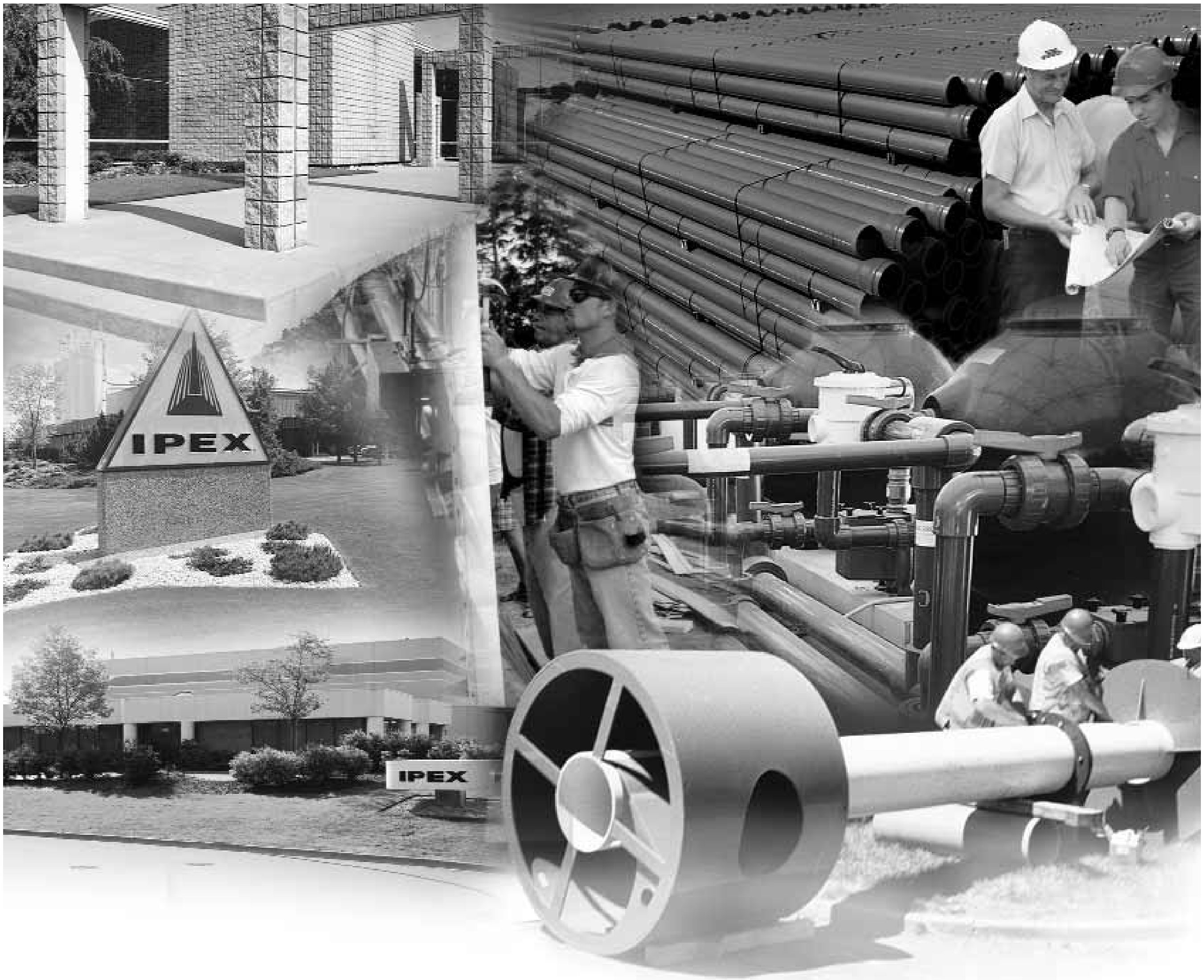
Thermoplastics:
CORZAN® Chlorinated-Polyvinyl Chloride (CPVC)

IPEX

Chemical Resistance Guide

CORZAN® Chlorinated-Polyvinyl Chloride (CPVC)

1st Edition



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 from coast-to-coast. 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.

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, where 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 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

Ratings are according to the product and suppliers.

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).

Note: Chemical resistance data is found in a laboratory setting and cannot account for all possible variables of an installed application. It is up to the design engineer or final user to use this information as guidance for a specific application design.

If a material is chemically resistant to the concentrated form of a specific chemical, it should be resistant to the diluted form of that same chemical.

All Chemical Resistance data for Corzan® Chlorinated-Polyvinyl Chloride (CPVC) contained within this manual has been provided, with written consent, by Lubrizol Corporation.

Notes

CORZAN® CHLORINATED-POLYVINYL CHLORIDE (CPVC)

All Chemical Resistance data for Chlorinated-Polyvinyl Chloride (CPVC) contained within this manual has been provided, with written consent, by Lubrizol Corporation.

One of the key advantages of Corzan® CPVC is its excellent resistance to a broad range of corrosive environments. By replacing traditional materials with Corzan® CPVC, engineers can extend equipment service life and reduce maintenance, while minimizing process life-cycle costs.

This technical report is intended to provide engineers and end users with guidance as to the suitability of Corzan® industrial process piping systems in corrosive applications. In general, Corzan® CPVC is inert to most mineral acids, bases, salts, and aliphatic hydrocarbons, and compares favorably to other non-metals in these chemical environments. Specific use conditions must also be considered since these will determine the chemical resistance of any thermoplastic piping system. Variables that can affect chemical resistance include chemical concentration, temperature, pressure, external stress, and final product quality. Since the number of possible use conditions is so large, the final decision regarding material suitability often must be based on in-service testing.

The information contained in this report for process piping systems was developed to include conditions that are most often encountered in the industry. CPVC samples were immersed in the particular reagent for at least 90 days at 73°F (23°C) and 180°F (82°C).

Test data was reviewed in conjunction with field experience and information gathered from various sources to develop recommendations shown.

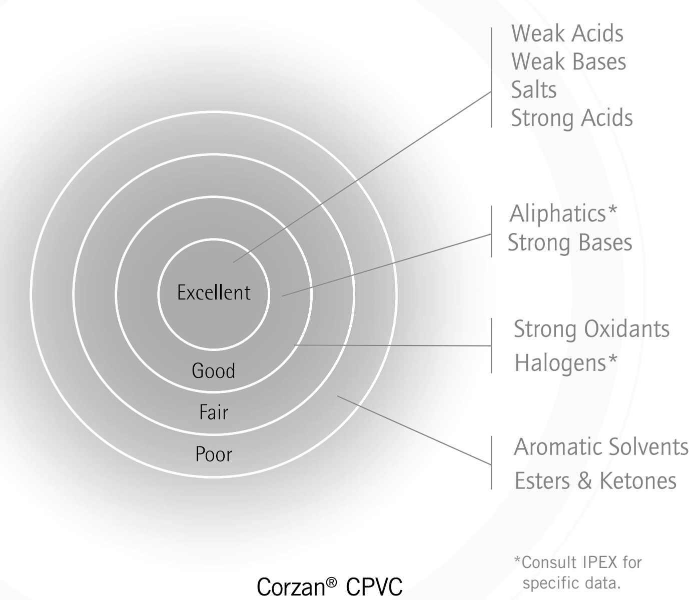
Note: Recommendations are based on specific use conditions and may not apply to all situations. For this reason, the final decision regarding material suitability must rest with the end user. The notes following the chemical resistance chart list specific areas where caution must be used when considering Corzan® CPVC. Additional chemical resistance data will become available as testing of Corzan® CPVC continues. Consult with IPEX or visit our website for the most current Corzan® CPVC chemical resistance information.

CPVC products are made with base resins having different molecular weights and chlorine content as well as different compound additives. Therefore, the compatibility recommendations made in this document can only apply to the products with which they have been tested (i.e. IPEX Corzan CPVC products.)

Information presented within this report is based on test data and field experience of CPVC manufactured by IPEX and is not intended to reflect the properties found with other suppliers of CPVC materials.

Classification:

R	Recommended
N	Not Recommended
C	Caution, further testing suggested - suspect with certain stress levels
–	Incomplete data
A	Case by case approval, contact IPEX
blank	No Data Available



Corzan® CPVC

Chemical Resistance for Industrial Piping Applications

CORZAN® (CPVC)
CHEMICAL RESISTANCE DATA

Reagent		Maximum Temperature						
	23°C (73°F)	41°C (105°F)	52°C (125°F)	54°C (130°F)	66°C (150°F)	77°C (170°F)	82°C (180°F)	93°C (200°F)
A								
Acetaldehyde	N	N	N	N	N	N	N	N
Acetic acid, up to 10%	R	R	R	R	R	R	R	
Acetic acid, >10%	C	C	C	C	C	C	C	C
Acetic acid, glacial	N	N	N	N	N	N	N	N
Acetic anhydride	N	N	N	N	N	N	N	N
Acetone, up to 5%	R	R	R	R	R	R	R	
Acetone, > 5%	C	C	C	C	C	C	C	C
Acetone, pure	N	N	N	N	N	N	N	N
Acetyle nitrile	N	N	N	N	N	N	N	N
Acrylic acid	N	N	N	N	N	N	N	N
Acrylonitrile	N	N	N	N	N	N	N	N
Adipic acid, saturated in water	R	R	R	R	R	R	R	R
Alcohols	C	C	C	C	C	C	C	C
Allyl alcohol	C	C	C	C	C	C	C	C
Ally chloride	N	N	N	N	N	N	N	N
Alum, all varieties	R	R	R	R	R	R	R	R
Aluminum acetate	R	R	R	R	R	R	R	R
Aluminum chloride	R	R	R	R	R	R	R	R
Aluminum fluoride	R	R	R	R	R	R	R	R
Aluminum hydroxide	R	R	R	R	R	R	R	R
Aluminum nitrate	R	R	R	R	R	R	R	R
Aluminum sulfate	R	R	R	R	R	R	R	R
Amines	N	N	N	N	N	N	N	N
Ammonia	N	N	N	N	N	N	N	N
Ammonium acetate	R	R	R	R	R	R	R	R
Ammonium benzoate	R	R	R	R	R	R	R	R
Ammonium bifluoride	R	R	R	R	R	R	R	R
Ammonium carbonate	R	R	R	R	R	R	R	R
Ammonium chloride	R	R	R	R	R	R	R	R
Ammonium citrate	R	R	R	R	R	R	R	R
Ammonium dichromate	R	R	R	R	R	R	R	R
Ammonium fluoride	R	R	R	R	R	R	R	R
Ammonium hydroxide, 28%	N	N	N	N	N	N	N	N
Ammonium hydroxide, 10%	N	N	N	N	N	N	N	N
Ammonium hydroxide, 3%	C							N
Ammonium nitrate	R	R	R	R	R	R	R	R
Ammonium persulfate	R							–
Ammonium phosphate	R							C

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CORZAN® (CPVC)

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Ammonium sulfamate	R	R	R	R	R	R	R	R
Ammonium sulfate	R	R	R	R	R	R	R	R
Ammonium sulfide	R	R	R	R	R	R	R	R
Ammonium thiocyanate	R	R	R	R	R	R	R	R
Ammonium tartrate	R	R	R	R	R	R	R	R
Amyl acetate	N	N	N	N	N	N	N	N
Amyl alcohol	C	C	C	C	C	C	C	C
Amyl chloride	N	N	N	N	N	N	N	N
Aniline	N	N	N	N	N	N	N	N
Antimony trichloride	R	R	R	R	R	R	R	R
Aqua regia	R							N
Aromatic hydrocarbons	N	N	N	N	N	N	N	N
Arsenic acid	R							–
B								
Barium carbonate	R	R	R	R	R	R	R	R
Barium chloride	R	R	R	R	R	R	R	R
Barium hydroxide	R	R	R	R	R	R	R	R
Barium nitrate	R	R	R	R	R	R	R	R
Barium sulfate	R	R	R	R	R	R	R	R
Barium sulfide	R	R	R	R	R	R	R	R
Beer	R	R	R	R	R	R	R	R
Beet sugar liquors	R	R	R	R	R	R	R	R
Benzaldehyde	N	N	N	N	N	N	N	N
Benzene	N	N	N	N	N	N	N	N
Benzoic acid, saturated in water	R							N
Benzyl alcohol	N	N	N	N	N	N	N	N
Benzyl chloride	N	N	N	N	N	N	N	N
Bismuth carbonate	R	R	R	R	R	R	R	R
Black liquor	R	R	R	R	R	R	R	R
Bleach, household (5% Cl)	R	R	R	R	R	R	R	R
Bleach, industrial (15 Cl)	R	R	R	R	R	R	R	R
Borax	R	R	R	R	R	R	R	R
Boric acid	R	R	R	R	R	R	R	R
Brine acid	R	R	R	R	R	R	R	
Bromine	N	N	N	N	N	N	N	N
Bromine, aqueous, saturated	R	R	R	R	R	R	R	R
Bromobenzene	N	N	N	N	N	N	N	N

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Bromotoluene	N	N	N	N	N	N	N	N
Butanol	C	C	C	C	C	C	C	C
Butyl acetate	N	N	N	N	N	N	N	N
Butyl carbitol	N	N	N	N	N	N	N	N
Butyl cellosolve	N	N	N	N	N	N	N	N
Butyric acid, up to 1%	R	R	R	R	R	R	R	
Butyric acid, > 1%	C	C	C	C	C	C	C	C
Butyric acid, pure	N	N	N	N	N	N	N	N
C								
Cadmium acetate	R	R	R	R	R	R	R	R
Cadmium chloride	R	R	R	R	R	R	R	R
Cadmium sulfate	R	R	R	R	R	R	R	R
Calcium acetate	R	R	R	R	R	R	R	R
Calcium bisulfide	R	R	R	R	R	R	R	R
Calcium bisulfite	R	R	R	R	R	R	R	R
Calcium carbonate	R	R	R	R	R	R	R	R
Calcium chlorate	R	R	R	R	R	R	R	R
Calcium chloride	R	R	R	R	R	R	R	R
Calcium hydroxide	R	R	R	R	R	R	R	R
Calcium hypochlorite	R	R	R	R	R	R	R	R
Calcium nitrate	R	R	R	R	R	R	R	R
Calcium oxide	R	R	R	R	R	R	R	R
Calcium sulfate	R	R	R	R	R	R	R	R
Cane sugar liquors	R	R	R	R	R	R	R	R
Caprolactam	N	N	N	N	N	N	N	N
Caprolactone	N	N	N	N	N	N	N	N
Carbitol	N	N	N	N	N	N	N	N
Carbon dioxide	R	R	R	R	R	R	R	R
Carbon disulfide	N	N	N	N	N	N	N	N
Carbon monoxide	R	R	R	R	R	R	R	R
Carbon tetrachloride	N	N	N	N	N	N	N	N
Carbonic acid	R	R	R	R	R	R	R	R
Castor oil	C	C	C	C	C	C	C	C
Caustic potash	R	R	R	R	R	R	R	
Caustic soda	A	A	A	A	A	A	A	A
Cellosolve, all types	N	N	N	N	N	N	N	N
Chloric acid	R	R	R	R	R	R	R	

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Chlorinated solvents	N	N	N	N	N	N	N	N
Chlorinated water, (hypochlorite)	R	R	R	R	R	R	R	R
Chlorine, dry gas	A	A	A	A	A	A	A	A
Chlorine, liquid	N	N	N	N	N	N	N	N
Chlorine, trace in air	R	R	R	R	R	R	R	R
Chlorine, wet gas	A	A	A	A	A	A	A	A
Chlorine dioxide, aqueous, saturated	R	R	R	R	R	R	R	R
Chlorine water, saturated	R	R	R	R	R	R	R	R
Chlorobenzene	N	N	N	N	N	N	N	N
Chloroform	N	N	N	N	N	N	N	N
Chromic acid, 40% (concentrated)	R	R	R	R	R	R	R	
Chromium nitrate	R	R	R	R	R	R	R	R
Citric acid	R	R	R	R	R	R	R	R
Citrus oils	N	N	N	N	N	N	N	N
Coconut oil	N	N	N	N	N	N	N	N
Copper acetate	R	R	R	R	R	R	R	R
Copper carbonate	R	R	R	R	R	R	R	R
Copperchloride	R	R	R	R	R	R	R	R
Copper cyanide	R	R	R	R	R	R	R	R
Copper fluoride	R	R	R	R	R	R	R	R
Copper nitrate	R	R	R	R	R	R	R	R
Copper sulfate	R	R	R	R	R	R	R	R
Corn oil	N	N	N	N	N	N	N	N
Corn syrup	R	R	R	R	R	R	R	R
Cottonseed oil	N	N	N	N	N	N	N	N
Creosote	N	N	N	N	N	N	N	N
Cresol	N	N	N	N	N	N	N	N
Crotonaldehyde	N	N	N	N	N	N	N	N
Cumene	N	N	N	N	N	N	N	N
Cupric fluoride	R	R	R	R	R	R	R	R
Cupric sulfate	R	R	R	R	R	R	R	R
Cuprous chloride	R	R	R	R	R	R	R	R
Cyclohexane	N	N	N	N	N	N	N	N
Cyclohexanol	N	N	N	N	N	N	N	N
Cyclohexanone	N	N	N	N	N	N	N	N

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D								
Detergents	C	C	C	C	C	C	C	C
Dextrin	R	R	R	R	R	R	R	R
Dextrose	R	R	R	R	R	R	R	R
Dibutyl Phthalate	N	N	N	N	N	N	N	N
Dibutyl ethyl phthalate	N	N	N	N	N	N	N	N
Dichlorobenzene	N	N	N	N	N	N	N	N
Dichloroethylene	N	N	N	N	N	N	N	N
Diethylamine	N	N	N	N	N	N	N	N
Diethyl ether	N	N	N	N	N	N	N	N
Dill oil	N	N	N	N	N	N	N	N
Dimethylformamide	N	N	N	N	N	N	N	N
Disodium phosphate	R	R	R	R	R	R	R	R
Distilled water	R	R	R	R	R	R	R	R
E								
EDTA, tetrasodium	R	R	R	R	R	R	R	R
Esters	N	N	N	N	N	N	N	N
Ethanol, up to 5%	R	R	R	R	R	R	R	
Ethanol > 5%	C	C	C	C	C	C	C	C
Ethers	N	N	N	N	N	N	N	N
Ethyl acetate	N	N	N	N	N	N	N	N
Ethyl acrylate	N	N	N	N	N	N	N	N
Ethyl benzene	N	N	N	N	N	N	N	N
Ethyl chloride	N	N	N	N	N	N	N	N
Ethyl ether	N	N	N	N	N	N	N	N
Ethylene bromide	N	N	N	N	N	N	N	N
Ethylene chloride	N	N	N	N	N	N	N	N
Ethylene diamine	N	N	N	N	N	N	N	N
Ethylene glycol, up to 50%	R	R	R	R	R	R	R	
Ethylene glycol, > 50%	C	C	C	C	C	C	C	C
Ethylene oxide	N	N	N	N	N	N	N	N
F								
Ferric chloride	R	R	R	R	R	R	R	R
Ferric hydroxide	R	R	R	R	R	R	R	R
Ferric nitrate	R	R	R	R	R	R	R	R

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Ferric sulfate	R	R	R	R	R	R	R	R
Ferrous chloride	R	R	R	R	R	R	R	R
Ferrous hydroxide	R	R	R	R	R	R	R	R
Ferrous sulfate	R	R	R	R	R	R	R	R
Fluorine gas	N	N	N	N	N	N	N	N
Fluosillicic acid, 30%	R	R	R	R	R	R	R	
Formaldehyde	N	N	N	N	N	N	N	N
Formic acid, up to 25%	R	R	R	R	R	R	R	
Formic acid > 25%	C							N
Freons	C	C	C	C	C	C	C	C
Fructose	R	R	R	R	R	R	R	R
G								
Gasoline	N	N	N	N	N	N	N	N
Glucose	R	R	R	R	R	R	R	R
Glycerine	R	R	R	R	R	R	R	R
Glycol ethers	N	N	N	N	N	N	N	N
Green liquor	R	R	R	R	R	R	R	R
H								
Halocarbon oils	N	N	N	N	N	N	N	N
Heptane	C							–
Hydrazine	N	N	N	N	N	N	N	N
Hydrochloric acid	R	R	R	R	R	R	R	
Hydrochloric acid, 36% concentrated	R	R	R	R	R	R	R	
Hydrofluoric acid, 3%	R							–
Hdrofluoric acid, 48%	C	C	C	C	C	C	C	C
Hydrofluosilicic acid, 30%	R	R	R	R	R	R	R	
Hydrogen peroxide, 50%	R	R	R	R	R	R	R	–
Hydrogen sulfide, aqueous	R	R	R	R	R	R	R	
Hypochlorous acid	C	C	C	C	C	C	C	C
I								
Isopropanol	C	C	C	C	C	C	C	C

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K								
Ketones	N	N	N	N	N	N	N	N
Kraft Liquors	R	R	R	R	R	R	R	R
L								
Lactic acid, 25%	R	R	R	R	R	R	R	R
Lactic acid, 85% (full strength)	R							C
Lead acetate	R	R	R	R	R	R	R	R
Lead chloride	R	R	R	R	R	R	R	R
Lean nitrate	R	R	R	R	R	R	R	R
Lead sulfate	R	R	R	R	R	R	R	R
Lemon oil	N	N	N	N	N	N	N	N
Limonene	N	N	N	N	N	N	N	N
Linseed oil	N	N	N	N	N	N	N	N
Lithium chloride	R	R	R	R	R	R	R	R
Lithim sulfate	R	R	R	R	R	R	R	R
Lubricating oil, ASTM 1,2,3	R							–
M								
Magnesium carbonate	R	R	R	R	R	R	R	R
Magnesium chloride	R	R	R	R	R	R	R	R
Magnesium citrate	R	R	R	R	R	R	R	R
Magnesium fluoride	R	R	R	R	R	R	R	R
Magnesium hydroxide	R	R	R	R	R	R	R	R
Magnesium salts, inorganic	R	R	R	R	R	R	R	R
Magnesium nitrate	R	R	R	R	R	R	R	R
Magnesium oxide	R	R	R	R	R	R	R	R
Magnesium sulfate	R	R	R	R	R	R	R	R
Maleic acid, 50%	R	R	R	R	R	R	R	
Manganese sulfate	R	R	R	R	R	R	R	R
Mercuric chloride	R	R	R	R	R	R	R	R
Mercuric cyanide	R	R	R	R	R	R	R	R
Mercuric sulfate	R	R	R	R	R	R	R	R
Mercurous nitrate	R	R	R	R	R	R	R	R
Mercury	R	R	R	R	R	R	R	
Methane sulfonic acid	R	R	R	R	R	R	R	
Methanol, up to 10%	R	R	R	R	R	R	R	

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Methanol, > 10%	C	C	C	C	C	C	C	C
Methanol, pure	N	N	N	N	N	N	N	N
Methyl cellosolve	N	N	N	N	N	N	N	N
Methyl chloride	N	N	N	N	N	N	N	N
Methly ethyl ketone	N	N	N	N	N	N	N	N
Methyl formate	N	N	N	N	N	N	N	N
Methyl isobutyl ketone	N	N	N	N	N	N	N	N
Methly methacrylate	N	N	N	N	N	N	N	N
Methylamine	N	N	N	N	N	N	N	N
Methylene chloride	N	N	N	N	N	N	N	N
Mineral oil	R							–
Monoethanolamine	N	N	N	N	N	N	N	N
Motor oil	N	N	N	N	N	N	N	N
Muriatic acid	R	R	R	R	R	R	R	
N								
Naphthalene	N	N	N	N	N	N	N	N
Nickel acetate	R	R	R	R	R	R	R	R
Nickel chloride	R	R	R	R	R	R	R	R
Nickel nitrate	R	R	R	R	R	R	R	R
Nickel sulfate	R	R	R	R	R	R	R	R
Nitric acid, up to 25%	R	R	R	R	R			
Nitric acid, 25-35%	R	R	R	R				
Nitric acid, 70%	R	R						
Nitrobenzene	N	N	N	N	N	N	N	N
O								
1-Octanol	C							N
Oils, edible	N	N	N	N	N	N	N	N
Oils, sour crude	N	N	N	N	N	N	N	N
Oleum	N	N	N	N	N	N	N	N
Olive oil	N	N	N	N	N	N	N	N
Oxalic acid, saturated	R	R	R	R	R	R		
Oxygen	R	R	R	R	R	R	R	
Ozonized water	R	R	R	R	R	R	R	R

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CORZAN® (CPVC)
CHEMICAL RESISTANCE DATA

Reagent		Maximum Temperature						
	23ºC (73ºF)	41ºC (105ºF)	52ºC (125ºF)	54ºC (130ºF)	66ºC (150ºF)	77ºC (170ºF)	82ºC (180ºF)	93ºC (200ºF)
P								
Palm oil	N	N	N	N	N	N	N	N
Paraffin	R	R	R	R	R	R	R	
Peanut oil	N	N	N	N	N	N	N	N
Perchloric acid, 10%	R							–
Phenylhydrazine	N	N	N	N	N	N	N	N
Phosphoric acid	R	R	R	R	R	R	R	
Phosphorus trichloride	N	N	N	N	N	N	N	N
Picric acid	N	N	N	N	N	N	N	N
Pine oil	N	N	N	N	N	N	N	N
Plating solutions	R	R	R	R	R	R	R	
Polyethylene glycol	N	N	N	N	N	N	N	N
Potash	R	R	R	R	R	R	R	R
Potassium acetate	R	R	R	R	R	R	R	R
Potassium bicarbonate	R	R	R	R	R	R	R	R
Potassium bichromate	R	R	R	R	R	R	R	R
Potassium bisulfate	R	R	R	R	R	R	R	R
Potassium borate	R	R	R	R	R	R	R	R
Potassium bromate	R	R	R	R	R	R	R	R
Potassium bromide	R	R	R	R	R	R	R	R
Potassium carbonate	R	R	R	R	R	R	R	R
Potassium chlorate	R	R	R	R	R	R	R	R
Potassium chloride	R	R	R	R	R	R	R	R
Potassium chromate	R	R	R	R	R	R	R	R
Potassium cyanate	R	R	R	R	R	R	R	R
Potassium cyanide	R	R	R	R	R	R	R	R
Portassium dichromate	R	R	R	R	R	R	R	R
Potassium ferricyanide	R	R	R	R	R	R	R	R
Potassium ferrocyanide	R	R	R	R	R	R	R	R
Potassium fluoride	R	R	R	R	R	R	R	R
Potassium hydroxide	R	R	R	R	R	R	R	R
Potassium hypochlorite	A	A	A	A	A	A	A	A
Potassium iodide	R	R	R	R	R	R	R	R
Potassium nitrate	R	R	R	R	R	R	R	R
Potassium perborate	R	R	R	R	R	R	R	
Potassium perchlorate, saturated	R	R	R	R	R	R	R	
Potassium permanganate, saturated	R	R	R	R	R	R	R	
Potassium persulfate, saturated	R							–
Potassium phosphate	R	R	R	R	R	R	R	R

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Potassium sulfate	R	R	R	R	R	R	R	R
Potassium sulfide	R	R	R	R	R	R	R	R
Potassium sulfite	R	R	R	R	R	R	R	R
Potassium tripolyphosphate	R	R	R	R	R	R	R	R
Propanol, up to 0.5%	R	R	R	R	R	R	R	
Propanol, > 0.5%	C	C	C	C	C	C	C	C
Propionic acid, up to 2%	R	R	R	R	R	R	R	
Propionic acid, > 2%	C	C	C	C	C	C	C	C
Propionic acid, pure	N	N	N	N	N	N	N	N
Propylene dichloride	N	N	N	N	N	N	N	N
Propylene glycol, up to 25%	R	R	R	R	R	R	R	
Propylene glycol, > 25%	C	C	C	C	C	C	C	C
Propylene oxide	N	N	N	N	N	N	N	N
Pyridine	N	N	N	N	N	N	N	N
S								
Sea water	R	R	R	R	R	R	R	R
Silicic acid	R							–
Silicone oil	R							–
Silver chloride	R	R	R	R	R	R	R	R
Silver Cyanide	R	R	R	R	R	R	R	R
Silver nitrate	R	R	R	R	R	R	R	R
Silver sulfate	R	R	R	R	R	R	R	R
Soaps	R	R	R	R	R	R	R	R
Sodium acetate	R	R	R	R	R	R	R	R
Sodium aluminate	R	R	R	R	R	R	R	R
Sodium arsenate	R	R	R	R	R	R	R	R
Sodium benzoate	R	R	R	R	R	R	R	R
Sodium bicarbonate	R	R	R	R	R	R	R	R
Sodium bichromate	R	R	R	R	R	R	R	R
Sodium bisulfate	R	R	R	R	R	R	R	R
Sodium bisulfite	R	R	R	R	R	R	R	R
Sodium borate	R	R	R	R	R	R	R	R
Sodium bromide	R	R	R	R	R	R	R	R
Sodium carbonate	R	R	R	R	R	R	R	R
Sodium chlorate	R	R	R	R	R	R	R	R
Sodium chlorite	R	R	R	R	R	R	R	R
Sodium chromate	R	R	R	R	R	R	R	R

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Sodium cyanide	R	R	R	R	R	R	R	R
Sodium dichromate	R	R	R	R	R	R	R	R
Sodium ferricyanide	R	R	R	R	R	R	R	R
Sodium ferrocyanide	R	R	R	R	R	R	R	R
Sodium fluoride	R	R	R	R	R	R	R	R
Sodium formate	R	R	R	R	R	R	R	R
Sodium hydroxide	A	A	A	A	A	A	A	A
Sodium hypobromite	R	R	R	R	R	R	R	R
Sodium hypochlorite	R	R	R	R	R	R	R	R
Sodium iodide	R	R	R	R	R	R	R	R
Sodium metaphosphate	R	R	R	R	R	R	R	R
Sodium nitrate	R	R	R	R	R	R	R	R
Sodium nitrite	R	R	R	R	R	R	R	R
Sodium perborate	R	R	R	R	R	R	R	
Sodium perchlorate	R	R	R	R	R	R	R	
Sodium phosphate	R	R	R	R	R	R	R	R
Sodium silicate	R	R	R	R	R	R	R	R
Sodium sulfate	R	R	R	R	R	R	R	R
Sodium sulfite	R	R	R	R	R	R	R	R
Sodium thiosulfate	R	R	R	R	R	R	R	R
Sodium tripolyphosphate	R	R	R	R	R	R	R	R
Soybeen oil	N	N	N	N	N	N	N	N
Stannic chloride	R	R	R	R	R	R	R	R
Stannous chloride	R	R	R	R	R	R	R	R
Stannous sulfate	R	R	R	R	R	R	R	R
Starch	R	R	R	R	R	R	R	R
Stearic acid	R							–
Strontium chloride	R	R	R	R	R	R	R	R
Styrene	N	N	N	N	N	N	N	N
Sugar	R	R	R	R	R	R	R	R
Sulfamic acid	R	R	R	R	R	R	R	
Sulfur	R							–
Sulfuric acid, fuming	N	N	N	N	N	N	N	N
Sulfuric acid, 98%	R	R	R					
Sulfuric acid, 85%	R	R	R	R	R	R		
Sulfuric acid, 80%	R	R	R	R	R	R	R	
Sulfuric acid, 50%	R	R	R	R	R	R	R	

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T								
Tall oil	C	C	C	C	C	C	C	C
Tannic acid, 30%	R							–
Tartaric acid	R							–
Terpenes	N	N	N	N	N	N	N	N
Tetraydrofuran	N	N	N	N	N	N	N	N
Tetrasodiumpyrophosphate	R	R	R	R	R	R	R	R
Texanol	N	N	N	N	N	N	N	N
Thionyl chloride	N	N	N	N	N	N	N	N
Toluene	N	N	N	N	N	N	N	N
Tributyl phosphate	N	N	N	N	N	N	N	N
Trichloroethylene	N	N	N	N	N	N	N	N
Trisodium phosphate	R	R	R	R	R	R	R	R
Turpentine	N	N	N	N	N	N	N	N
U								
Urea	R	R	R	R	R	R	R	
Urine	R	R	R	R	R	R	R	R
V								
Vegetable oils	N	N	N	N	N	N	N	N
Vinegar	R	R	R	R	R	R	R	R
Vinyl acetate	N	N	N	N	N	N	N	N
W								
Water, deionized	R	R	R	R	R	R	R	R
Water, demineralized	R	R	R	R	R	R	R	R
Water, distilled	R	R	R	R	R	R	R	R
Water, salt	R	R	R	R	R	R	R	R
Water, swimming pool	R	R	R	R	R	R	R	R
WD-40	C	C	C	C	C	C	C	C
White liquor	R	R	R	R	R	R	R	R

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X								
Xylene	N	N	N	N	N	N	N	N
Z								
Zinc acetate	R	R	R	R	R	R	R	R
Zinc carbonate	R	R	R	R	R	R	R	R
Zinc chloride	R	R	R	R	R	R	R	R
Zinc nitrate	R	R	R	R	R	R	R	R
Zinc sulfate	R	R	R	R	R	R	R	R

The surface temperature of gray CPVC installed in direct sunlight can reach peak temperatures approaching 70ºC (175ºF). This should be taken into account when establishing the maximum operating temperature of the system.

Given precentages are by weight

Noted Caution Areas for CPVC Process Piping

CPVC is not recommended for use with most polar organic materials including various solvents, i.e. chlorinated or aromatic hydrocarbons, esters, or ketones.

Resistance of CPVC to certain other fluid mixtures such as fuel oils with moderate aromatic content cannot be determined on basis of immersion testing alone. Actual use data must be obtained.

There are a number of similarities in chemical resistance between PVC and CPVC materials. However, one must exercise caution when comparing the chemical resistance properties of CPVC to those of PVC, which are not always the same.

CPVC test samples exposed while under stress to surfactants, certain oils, or grease have shown signs of environmental stress cracking. Environmental stress cracking is a situation in which the manufactured pipe or fittings are weakened by contact with certain chemicals, and cracks are propagated by external stresses. External stresses include not only the known pressure stress on a system but also stresses from sources such as expansion and installation. When CPVC is intended for use in handling such chemicals, special consideration should be taken during design and installation to avoid unusual stresses in the piping system, or advance testing of the chemical in simulated use conditions is strongly suggested.

Certain organic solvents which are soluble with water, such as alcohols, may safely be handled below a certain concentration. Solvents which are insoluble in water, such as aromatics, will be absorbed by the piping over time, even when they are present at very low levels in the water. This will lead to a decreased service life expectancy for the system.

The full hydrostatic pressure rating of the pipe may not apply to the entire range of temperature and concentration designated as "recommended".

CPVC is not recommended for fuming acid service.

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NOTES

NOTES

SALES AND CUSTOMER SERVICE

Canadian Customers call IPEX Inc.
Toll free: (866) 473-9462
www.ipexinc.com

U.S. Customers call IPEX USA LLC
Toll free: (800) 463-9572
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About the IPEX Group of Companies

As leading suppliers of thermoplastic piping systems, the IPEX Group of Companies provides our customers with some of the largest and most comprehensive product lines. All IPEX products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have established a reputation for product innovation, quality, end-user focus and performance.

Markets served by IPEX group products are:

- Electrical systems
- Telecommunications and utility piping systems
- PVC, CPVC, PP, ABS, PEX, FR-PVDF and PE pipe and fittings (1/4" to 48")
- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- PE Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems

IPEX