Introduction

The following guide is a compilation of corrosion resistance information obtained from resin manufacturers and actual test results on our pipe. The recommendations are believed to represent acceptable continuous environments for satisfactory long-term pipe performance, however, individual project conditions should be considered when selecting the appropriate product construction. Also, pressure and stiffness ratings may be reduced at elevated temperatures. It is our intention to assist the design engineer as much as possible in making these evaluations.

Chemicals

Chemicals not listed on the following pages have probably not been tested with our pipe materials by the date of this publication. Contact us for new information.

Temperature

The recommended maximum temperature given is not always the absolute maximum accept- able service temperature. It is the highest temperature at which a resin or product has been tested, used or evaluated. A product may be suitable for higher temperature operation, but additional information or testing would be required in order to establish such performance.

Coupling gaskets

The standard coupling gasket material is an elastomeric compound. It exhibits superior chemical and temperature resistance and it is suitable for a wide variety of environments including sanitary sewage, water, salt water, many acids, bases, salts and other chemicals. Some types of gaskets may be sensitive to some chemicals such as some hydrocarbons and many chlorinated and aromatic solvents.

Alternate gasket materials may be available for these situations. We would be pleased to assist you in the selection of an Appropriate gasket material and In the establishment of specific limitations for temperature and concentration based on your individual application.

Abbreviations & Symbols

STD (Standard) - STD refers using thermosetting polyester resins.

VE (Vinyl Ester) - VE refers using thermosetting vinyl ester resins.

NR (Not Recommended) - Product of this construction is not recommended for continuous service in this environment. However, it may be suitable at a lower concentration or for intermittent exposure

- (Dash) - This symbol indicates no data is currently available.

Chemical	Concentration % By Weight	Maximum Recommended Temperature °F.	
		STD	VE
A			
Acetaldehyde	All	NR	NR
Acetic Acid	0-25	—	150
	25-50	—	150
	50-75	—	—
Acetic Anhydride	All	NR	NR
Acetone	100	NR	NR
Acrylic Acid	25	—	
Acrylonitrile	All	NR	NR
Alcohol, Butyl	All	NR	—
Alcohol, Ethyl	10	80	150
	100	—	—
Alcohol,Isopropyl	10	80	150
	100	NR	—
Alcohol,Methyl	10	NR	—
	100	NR	NR
Alcohol,Methyl Isobutyl	10	NR	—
Alcohol, Secondary Butyl	10	NR	150
Allyl Chloride	All	NR	NR
Alum	All	100	180

Chemical	Concentration % By Weight	Maximum Recommended Temperature °F.	
		STD	VE
Aluminum Chloride	All	100	180
Aluminum Fluoride	All	—	80
Aluminum Hydroxide	All	NR	150
Aluminum Nitrate	All	100	150
Aluminum Pottasium Sulfate	All	90	180
Ammonia, Aqueous	0-20	NR	140
Ammonia, Gas		NR	100
Ammonia, Liquid		NR	NR
Ammonium Bicarbonate	0-50	NR	150
Ammonium Bisulfite	All	—	150
Ammonium Carbonate	All	NR	150
Ammonium Chloride	All	90	180
Ammonium Citrate	All	—	150
Ammonium Fluoride	All	—	150
Ammonium Hydroxide	5	NR	150
	10	NR	150
	20	NR	150
	29	NR	100
Ammonium Nitrate	All	90	180
Ammonium Persulfate	All	NR	180

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Chemical	Concentration % By Weight	Maximum Recommended Temperature °F.	
		STD	VE
Ammonium Phosphate	65	90	180
Ammonium Sulfate	All	90	180
Amyl Acetate	100	NR	NR
Aniline	All	NR	NR
Aniline Hydrochloride	All	—	150
Aniline Sulfate	All	NR	180
Arsenious Acid	All	—	—
B			
Barium Acetate	All	NR	180
Barium Carbonate	All	NR	180
Barium Chloride	All	100	180
Barium Hydroxide	0-10	NR	150
Barium Sulfate	All	90	180
Barium Sulfide	All	NR	180
Beer		80	120
Benzene	100	NR	NR
5% Benzene in Kerosene		—	—
Benzene Sulfonic Acid	All	NR	180
Benzoic Acid	All	—	180
Benzyl Alcohol	100	NR	NR
Benzyl Chloride	100	NR	NR
Black Liquor Recovery, (furnace gasses)		NR	—
Bromine, Liquid		NR	NR
Bromine, Water	5	NR	—
Butyl Acetate	100	NR	NR
Butyric Acid	0-50	—	—
	100	NR	—
C			
Cadmium Chloride	All	—	180
Calcium Bisulfite	All	—	180
Calcium Carbonate	All	NR	180
Calcium Chlorate	All	—	180
Calcium Chloride	All	100	180
Calcium Hydroxide	All	NR	180
Calcium Hypochlorite	All	NR	160
Calcium Nitrate	All	100	180
Calcium Sulfate	All	90	180
Calcium Sulfite	All	—	180
Carbon Tetrachloride	100	NR	—
Carbon Acid		—	—
Carbo Wax	—	—	—
Castor Oil		—	180
CarboxyMethyl Cellulose	10	—	150
Chlorinated Brine Liquors(Caustic Chlorine cell)		—	—
Chlorinated wax	All	—	180
Chlorine Dioxide/Air	15	NR	—

Chemical	Concentration % By Weight	Maximum Recommended Temperature °F.	
		STD	VE
Chlorine Dioxide/ Wet Gas	Saturated	NR	180
Chlorine, Dry Gas	100	NR	180
Chlorine, Wet Gas	100	NR	180
Chlorine, Liquid		NR	NR
Chlorine Water	All	NR	—
Chloracetic Acid	25	NR	—
	50	NR	—
Chlorobenzene	Con.	NR	NR
Chloroform	100	NR	NR
Chlorosulfonic Acid	100	NR	NR
Chromic Acid	20	NR	NR
	30	NR	—
Chromium Sulfate	All	—	—
Citric Acid	All	100	180
Coconut Oil		—	180
Copper Chloride	All	100	180
Copper Cyanide	All	NR	180
Copper Fluoride	All	NR	180
Copper Nitrate	All	100	180
Copper Sulfate	All	100	180
Corn Oil		—	180
Corn Starch	Slurry	—	180
Corn Sugar	All	—	180
Cottonseed Oil		—	180
Cresylic Acid	100	NR	NR
Crude Oil, Sour	100	80	180
Crude Oil, Sweet	100	80	180
Cyclohexane	100	NR	—
Cyclohexanone	100	NR	—
D			
Detergents, Sulfonated	All	—	—
Dialfyl Phthalate	All	—	—
Di-Ammonium Phosphate	65	—	180
Dibromophenol	100	NR	NR
Dibutyl Ether	100	—	—
Dichloro Benzene	100	NR	NR
Dichloroethylene	100	NR	NR
Dichloromonomethane	100	NR	NR
Dichloropropane	100	NR	NR
Dichloropropene	100	NR	NR
Diesel Fuel	100	90	180
Diethanol Amine	100	—	—
Diethyl Amine	100	NR	NR
Diethyl Benzene	100	NR	
Diethyl Carbonate	100	NR	NR
Diethylene Glycol	100	—	—

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Chemical	Concentration % By Weight	Maximum Recommended Temperature °F.	
		STD	VE
Diethylhexyl Phosphoric Acid (in Kerosene)	20	—	120
Diethyl Sulfate	100	NR	NR
Diisopropanol Amine	100	—	—
Dimethyl Formamide	100	NR	NR
Dimethyl Morpholine	100	NR	NR
Dimethyl Phthalate	100	NR	—
Dioctyl Phthalate	100	NR	—
Dipropylene Glycol	100	—	—
E			
Electrosol	5	—	150
Epichlorohydrin	100	NR	NR
Epoxidized Soybean Oil	100	—	150
Ethyl Acetate	100	NR	NR
Ethyl Acrylate	100	NR	NR
Ethyl Benzene	100	NR	NR
Ethyl Bromide	100	NR	NR
Ethyl Chloride	100	NR	NR
Ethyl Ether	100	NR	NR
Ethylene Glycol	All	NR	NR
Ethyl Sulfate	100	90	180
F			
Fatty Acids	All	—	180
Ferric Chloride	All	100	180
Ferric Nitrate	All	100	180
Ferric Sulfate	All	100	180
Ferrous Chloride	All	100	180
G			
Gas, Natural		—	180
Gluconic Acid	50	—	180
Glucose	All	100	180
Glycerine	All	90	180
Gold Plating Solution	63% Potassium Ferrocyanide;2% Potassium Gold Cyanide ; 8% Sodium Cyanide	—	180
H			
Heptane		—	150
Hexane		—	150
Hexylene Glycol		—	150
Hydraulic Fluid		—	180
Hydrazine		NR	NR
Hydro chloric Acid	0-20	NR	180
	20-37	NR	160
Hydro chloric Acid saturated with Chlorine gas	30	NR	—
Hydrocyanic Acid	All	—	180
Hydrofluoric Acid	10	NR	150

Chemical	Concentration % By Weight	Maximum Recommended Temperature °F.	
		STD	VE
Hydrofluoric Acid	20	NR	100
Hydrofluosilicic Acid	10	—	180
Hydrogen Bromide Wet Gas	100	—	180
Hydrogen Chloride Dry Gas	100	—	180
Wet Gas	100	—	180
Hydrogen Peroxide	0-30	NR	150
Hydrogen Sulfide, Dry	All	100	180
Hydrogen Sulfide Aqueous	All	100	180
Hydrogen Chloride Aqueous	All	100	180
Hydrogen Fluoride, Vapor		—	180
Hydrosulfite Bleach		—	180
Hypochlorous Acid	10	—	180
	20	NR	150
I			
Isopropyl Amine	All	—	100
Isopropyl Palmitate	100	—	180
K			
Kerosene		—	180
L			
Lactic Acid	All	—	180
Lasso*	(50% Chlorobenzene)	NR	NR
Latex	All	—	—
Laurel Chloride	100	—	180
Lauric Acid	All	—	180
Lead Acetate	All	—	180
Lead Nitrate	All	—	180
Levulinic Acid	All	—	180
Linseed Oil		—	180
Lithium Bromide	All	—	180
Lithium Sulfate	All	—	180
M			
Magnesium Bisulfite	All	—	180
Magnesium Carbonate	All	—	180
Magnesium Chloride	All	100	180
Magnesium Hydroxide	All	NR	180
Magnesium Sulfate	All	100	180
Maleic Acid	All	—	180
Mercuric Chloride	All	100	180
Mercurous Chloride	All	80	180
Methylene Chloride	100	NR	NR
Methyl Ethyl Ketone	100	NR	NR
Methyl Isobutyl Carbitol	100	NR	NR
Methyl Isobutyl Ketone	100	NR	NR

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Chemical	Concentration % By Weight	Maximum Recommended Temperature °F.	
		STD	VE
Methyl Styrene	100	NR	NR
Mineral Oils		80	180
Monochloro Acetic Acid	100	NR	NR
Monoethynolamine	100	NR	NR
Motor Oil	—	—	180
Myristic Acid	100	—	180
N			
Naphtha	100	—	180
Naphthalene	100	—	180
Nickel Plating	8% Lead;8% Fluoboric Acid;4% Boric Acid	—	180
Nickel Plating	11% Nickel Sulfate;2% Nickel Chloride;1% Boric Acid	—	180
Nickel Plating	44% Nickel Sulfate; 4%Ammonium Chloride;4% Boric Acid	—	180
Nickel Sulfate	All	100	180
Nitric Acid	5	NR	150
	20	NR	120
	52	NR	NR
Nitric Acid Fumes	—	—	160
Nitrobenzene	100	NR	NR
O			
Oakite Rust Stripper		—	180
Octanoic Acid	100	—	180
Oil, Sour Crude	100	80	180
Oil, Sweet Crude	100	80	180
Oleic Acid	All	NR	180
Oleum (Fuming Sulfuric)		NR	NR
Olive Oil	100	—	180
Oxalic Acid	All	—	180
P			
Perchloretylene	100	NR	100
Perchloric Acid	10	NR	150
	30	NR	100
Peroxide Bleach	2% Sodium Peroxide 96% .025% Epsom Salts, 5% Sodium Silicate, 42° BE 1.4% Sulfuric Acid, 66°BE	NR	180
Phenol	100	NR	NR
Phenol Sulfonic Acid	100	NR	NR
Phosphoric Acid	All	100	180
Phosphoric Acid Fumes		100	180
Phosphorous Pentoxide	0-54	—	180
Phosphorous Trichloride	100	NR	NR
Phthalic Acid	All	—	180

Chemical	Concentration % By Weight	Maximum Recommended Temperature °F.	
		STD	VE
Pickling Acids Sulfuric and Hydrochloric		NR	180
Picric Acid/ Alcoholic	10	NR	180
Polyvinyl Acetate Latex	All	—	180
Polyvinyl Alcohol	100	NR	120
Polyvinyl Chloride Latex with 35 parts DOP		—	120
Potassium Alum Sulfate	All	90	180
Potassium Bicarbonate	0-50	NR	150
Potassium Bromide	All	90	180
Potassium Carbonate	All	NR	150
Potassium Chloride	All	100	180
Potassium Dichromate	All	—	180
Potassium Ferricyanide	All	—	180
Potassium Ferrocyanide	All	—	180
Potassium Hydroxide	All	NR	150
Potassium Nitrate	All	100	180
Potassium Permanganate	All	NR	180
Potassium Persulfate	All	—	180
Potassium Sulfate	All	100	180
Propionic Acid	20	—	180
	50	—	160
	100	—	NR
Propylene Glycol	All	—	180
Pyridine	100	—	NR
S			
Salicylic Acid	All	—	160
Sebacic Acid	All	—	180
Selenius Acid	All	—	180
Silver Nitrate	All	—	180
Soaps	All	90	180
Sodium Acetate	All	—	180
Sodium Aluminate	All	NR	120
Sodium Alkyl Aryl Sulfonates	All	—	150
Sodium Benzoate	100	—	
Sodium Bicarbonate	All	NR	180
Sodium Bisulfate	All	80	180
Sodium Bromate	10	—	—
Sodium Carbonate	0-25	NR	—
	5	NR	—
Sodium Chloride	All	100	180

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Chemical	Concentration % By Weight	Maximum Recommended Temperature °F.	
		STD	VE
Sodium Chlorite	All	NR	150
Sodium Chromate	50	—	180
Sodium Cyanide	All	—	180
Sodium Dichromate	All	—	180
Sodium Di-Phosphate	All	—	180
Sodium Ferricyanide	All	—	180
Sodium Ferrocyanide	All	—	180
Sodium Fluoride	All	—	180
Sodium Fluoro Silicate	All	—	150
Sodium Hexametaphosphates	All	—	120
Sodium Hydroxide	5	NR	150
	10	NR	150
	25	NR	120
	50	NR	160
Sodium Hydrosulfide	All	—	180
Sodium Hypochlorite	0-5	70	180
	5-15	NR	150
Sodium Lauryl Sulfate	All	—	180
Sodium Mono-Phosphate	All	100	180
Sodium Nitrate	All	100	180
Sodium Nitrite	All	100	180
Sodium Persulate	20	—	130
Sodium Silicate	All	NR	180
Sodium Sulfate	All	100	180
Sodium Sulfide	All	NR	180
Sodium Sulfite	All	NR	180
Sodium Tetro Borate	All	—	180
Sodium Thiocyanate	57	—	180
Sodium Thiosulfate	All	—	180
Sodium Tripolyphosphate	All	—	180
Sodium Xylene Sulfonate	All	NR	180
Sorbitol Solutions	All	—	150
Sour Crude Oil	100	80	180
Soya Oil	All	—	180
Stannic Chloride	All	—	180
Stannous Chloride	All	—	180
Stearic Acid	All	100	180
Styrene	100	NR	NR
Sugar, Beet and Cane Liquor	All	—	180
Sugar, Sucrose	All	—	180
Sulfamic Acid	0-25	70	180
Sulfanilic Acid	All	—	180
Sulfated Detergents	All	100	180
Sulfur Dioxide Dry or Wet		NR	—
Sulfur Trioxide/Air	All	NR	180
Sulfuric Acid	0-5	100	180
	5-70	—	160
	75	NR	—
	Over 75	NR	NR
Sulfurous Acid	All	NR	—
Superphosphoric Acid	105 % H_3PO_3 76 % P20s	NR	180
T			
Tall Oil	All	—	—
Tannic Acid	All	—	—
Tartaric Acid	All	NR	180
Tetrachloroethylene	100	NR	NR
Thionyl Chloride	100	NR	NR
Toluene	100	NR	NR
Toluene Solfonic Acid	All	—	180
Transformer Oils:			
Mineral Oil Types		—	180
Chloro-Phenyl Types		NR	NR
Trichlor Acetic Acid	50	NR	180
Trichloroethane	100	NR	—
Trichloroethylene	100	NR	NR
Trichlorophenol	100	NR	NR
Tridecylbenzene Sulfonate	All	—	180
Trimethylene Chlorobromide	100	NR	NR
Trisodium Phosphate	All	NR	18O
Turpentine	100	NR	—
Tween Surfactant	All	—	150
V			
Vegetable Oils		100	180
Vinegar		100	180
Vinyl Acetate	100	NR	NR
Vinyl Toluene	100nr		—
W			
Water			
Deionized		NR	180
Demineralized		100	180
Distilled		100	180
Fresh		100	180
Salt/Sea		100	180
X			
Xylene	100	NR	NR
Z			
Zinc Chlorate	All	—	180
Zinc Chloride		100	180
Zinc Nitrate		100	180
Zinc Sulfate		100	180

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