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Chemical Resistance and Material Selection Guide

The following guide lists corrosion resistance information of four materials used in drum pump outer tubes. Additional wetted materials maybe found inside the pump tube such as Alloy 625, PTFE (Teflon), Viton[®], etc. Refer to the series specific flier (PF Series flier for example) for a complete list of wetted components. The fliers can be downloaded from our website (www.grovhac.com). Contact Grovhac Inc. sales with any questions.

This information is to be considered as a basis for recommendation, but not as a guarantee. Where chemical compatibility is in question, the material should be tested under actual field conditions to determine the best choice. All test data listed is at ambient temperature (72° Fahrenheit / 22° Celsius) unless otherwise stated.

COMPATIBILITY:

R = Recommended

NR = Not recommended

F = Fair, should be tested under field conditions

- = Unknown, contact chemical supplier

Caution: Use only air or explosionproof electric motors with stainless steel tubes and a static protection kit when pumping flammable and combustible materials.

Note: When pumping solvents, the TTS Series is generally the best choice.

MOTOR TYPE:

A = air

O = open weatherproof

T = TEFC (totally enclosed, fan cooled)

X = explosionproof electric

TUBE CONSTRUCTION to Pump Series Key

CPVC = TTC Series

PVDF = PFV Series

Polypropylene = EP, PFP, TBP Series

Stainless Steel = BTS, PFS, TBS, TM, TTS Series

TUBE CONSTRUCTION

Chemical	CPVC (max 150°F)	Polypropylene (max 160°F)	PVDF (max 120°F)	Stainless Steel (max 150°F for TTS, 220°F for PFS)	Motor Type
Acetaldehyde*	NR	NR	NR	R (Use TTS only)	A, X
Acetate Solvents*	NR	NR	NR	R (Use TTS only)	A, X
Acetic Acid, 10- 80%	NR	R (Use TTS, do not use PFP)	R	R (Use TTS only)	A, O, T
Acetone*	NR	NR	NR	R (Use TTS only)	A, X
Alcohols*	NR	NR	NR	R	A, X
Aluminum Chloride	R	R	R	NR	A, O, T
Aluminum Hydroxide	R	R	R	R	A, O, T
Ammonia, Aqua, 10%*	NR	NR	NR	R	A, X
Ammonium Nitrate	NR	R	R	R	A, O, T
Ammonium Sulfate	NR	R	R	R	A, O, T
Amyl Acetate*	NR	NR	NR	R (Use TTS only)	A, X
Arsenic Acid	R	R	R	R	A, O, T
Barium Carbonate	R	R	R	F	A, O, T
Benzene* (Benzol)*	NR	NR	NR	R	A, X
Bleach (sodium hypochlorite, 1-15%)	R	NR	R	NR	A, O, T
Borax (sodium borate)	R	R	R	R	A, O, T
Boric Acid	R	R	R	R	A, O, T
Brine	R	R	R	R	A, O, T
Butyl Acetate*	NR	NR	NR	R (Use TTS only)	A, X
Butylene*	NR	NR	NR	R	A, X
Butyric Acid	-	R	R	R	A, O, T
Calcium Carbonate	R	R	R	R	A, O, T
Calcium Chloride	R	R	R	R	A, O, T
Calcium Hypochlorite	R	R	R	NR	A, O, T

TUBE CONSTRUCTION

Chemical	CPVC (max 150°F)	Polypropylene (max 160°F)	PVDF (max 120°F)	Stainless Steel (max 150°F for TTS, 220°F for PFS)	Motor Type
Calcium Sulfate	R	R	R	R	A, O, T
Carbon Disulfide*	NR	NR	NR	R	A, X
Carbon Tetrachloride	NR	NR	R	R	A, O, T
Carbonic Acid	R	R	R	R	A, O, T
Caustic Soda	R	R	R	R	A, O, T
Chlorinated water >3,500 ppm	NR	NR	R	R	A, O, T
Chlorobenzene*	NR	NR	NR	R	A, X
Chromic Acid 40%	R	NR	R	NR	A, O, T
Citric Acid	R	R	R	R	A, O, T
Copper Cyanide	R	R	R	R	A, O, T
Cyclohexane*	NR	NR	NR	R	A, X
Cyclohexanol*	NR	NR	NR	R	A, X
Cyclohexanone*	NR	NR	NR	R (Use TTS only)	A, X
Detergent Solutions	R	R	R	R	A, O, T
Diacetone Alcohol*	NR	NR	NR	R (Use TTS only)	A, X
Dichloroethylene *	NR	NR	NR	R	A, X
Diesel Fuel*	NR	NR	NR	R	A, X
Diethyl Ether*	NR	NR	NR	R (Use TTS only)	A, X
Ether*	NR	NR	NR	R (Use TTS only)	A, X
Ethyl Acetate*	NR	NR	NR	R (Use TTS only)	A, X
Ethyl Chloride*	NR	NR	NR	R	A, X
Ethyl Ether*	NR	NR	NR	R (Use TTS only)	A, X
Ethylene Chloride*	NR	NR	NR	R	A, X
Ethylene Glycol	R	R	R	R	A, O, T
Fatty Acids	-	-	R	R	A, O, T
Ferric Chloride	R	R	R	NR	A, O, T

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Chemical	CPVC (max 150°F)	Polypropylene (max 160°F)	PVDF (max 120°F)	Stainless Steel (max 150°F for TTS, 220°F for PFS)	Motor Type
Ferric Nitrate	R	R	R	R	A, O, T
Ferrous Chloride	R	R	R	NR	A, O, T
Formaldehyde 37%	R	R	R	R	A, O, T
Formic Acid	R	R	R	R	A, O, T
Fuel Oils*	NR	NR	NR	R	A, X
Furfural*	NR	NR	NR	R (Use TTS only)	A, X
Gasoline*	NR	NR	NR	R	A, X
Glucose	R	R	R	R	A, O, T
Glycerine (Glycerol)	R	R	R	R	A, O, T
Heptane*	NR	NR	NR	R	A, X
Hexane*	NR	NR	NR	R	A, X
Hydrobromic Acid, 20%	NR	F	R	NR	A, O, T
Hydrochloric Acid, 37%	R	R	R	NR	A, O, T
Hydrofluoric Acid, 50%	NR	NR	R	NR	A, O, T
Hydrogen Peroxide	F (To 50%)	F (To 50%)	R	R	A, O, T
Ink	-	-	-	R	A, O, T
Iodine	NR	R	R	NR	A, O, T
Isopropyl Alcohol*	NR	NR	NR	R	A, X
Isopropyl Ether*	NR	NR	NR	R (Use TTS only)	A, X
Jet Fuels*	NR	NR	NR	R	A, X
Kerosene*	NR	NR	NR	R	A, X
Lacquers*	NR	NR	NR	R (Use TTS only)	A, X
Lacquer Solvents*	NR	NR	NR	R	A, X

TUBE CONSTRUCTION

Chemical	CPVC (max 150°F)	Polypropylene (max 160°F)	PVDF (max 120°F)	Stainless Steel (max 150°F for TTS, 220°F for PFS) (Use TTS only)	Motor Type
Lactic Acid	R	R	R	R	A, O, T
Latex	-	-	-	R	A, O, T
Lubricants	NR	NR	NR	R	A, O, T
Magnesium Chloride	R	R	R	F	A, O, T
Magnesium Hydroxide	R	R	R	R	A, O, T
Mercuric Chloride	R	R	R	NR	A, O, T
Mercuric Cyanide	R	R	R	R	A, O, T
Methyl Acetone*	NR	NR	NR	R (Use TTS only)	A, X
Methyl Ethyl Ketone*	NR	NR	NR	R (Use TTS only)	A, X
Methyl Isobutyl Ketone*	NR	NR	NR	R (Use TTS only)	A, X
Methylene Chloride	NR	NR	F	R	A, O, T
Naptha*	NR	NR	NR	R	A, X
Naphthalene*	NR	NR	NR	R	A, X
Nickel Chloride	R	R	R	R	A, O, T
Nickel Sulfate	R	R	R	R	A, O, T
Nitric Acid, 10-40%	F	F	R	R	A, O, T
Nitric Acid, 40-70%	NR	NR	R	R	A, O, T
Nitrobenzene*	NR	NR	NR	R (Use TTS only)	A, O, T
Oleic Acid	R	R	R	R	A, O, T
Oleum	NR	NR	NR	F	A, O, T
Phenol	F	NR	R	R	A, O, T
Phosphoric Acid, 20%	R	R	R	R	A, O, T
Phosphoric Acid, 40%	R	R	R	R	A, O, T
Plating Solution,	R	NR	R	NR	A, O, T

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Chrome					
Plating Solutions, Copper	R	R	R	-	A, O, T
Plating Solution, Lead	R	R	R	R	A, O, T
Plating Solution, Nickel	R	R	R	R	A, O, T
Plating Solution, Zinc	R	R	R	NR	A, O, T
Potassium Bicarbonate	R	R	R	R	A, O, T
Potassium Chloride	R	R	R	R	A, O, T
Potassium Cyanide	R	R	R	R	A, O, T
Potassium Hydroxide, 25%	R	R	NR	R	A, O, T
Potassium Nitrate	R	R	R	R	A, O, T
Soap Solutions	R	R	R	R	A, O, T
Sodium Acetate	R	NR	NR	R (Use TTS only)	A, O, T
Sodium Bicarbonate	R	R	R	R	A, O, T
Sodium Carbonate	R	R	R	R	A, O, T
Sodium Chloride	R	R	R	F	A, O, T
Sodium Hydroxide, 20%	R	R	NR	R	A, O, T
Sodium Hydroxide, 50%	R	R	NR	R	A, O, T
Sodium Hydroxide, 70%	R	R	NR	R	A, O, T
Sodium Hypochlorite, 1- 15%	R	NR	R	NR	A, O, T
Sodium Nitrate	R	R	R	R	A, O, T
Sulfuric Acid, <70%	R	R	R	NR	A, O, T
Sulfuric Acid, >70%	F	NR	R	NR	A, O, T
Tannic Acid	R	R	R	R	A, O, T
Tetrahydrofurane *	NR	NR	NR	R (Use TTS only)	A, X
Toluene*	NR	NR	NR	R (Use TTS only)	A, X
Trichloroethylene	NR	NR	R	R	A, O, T

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Turpentine*	NR	NR	NR	R	A, X
Urea	R	R	R	R	A, O, T
Vinegar	R	R (Do not use PFP due to Viton o-rings)	R	R (Use TTS only)	A, O, T
Water	R	R	R	R	A, O, T
White Liquor	R	R	R	R	A, O, T
Xylene (xylol)*	NR	NR	NR	R	A, X
Zinc Chloride	R	R	R	R	A, O, T
Zinc Sulfate	R	R	R	R	A, O, T

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