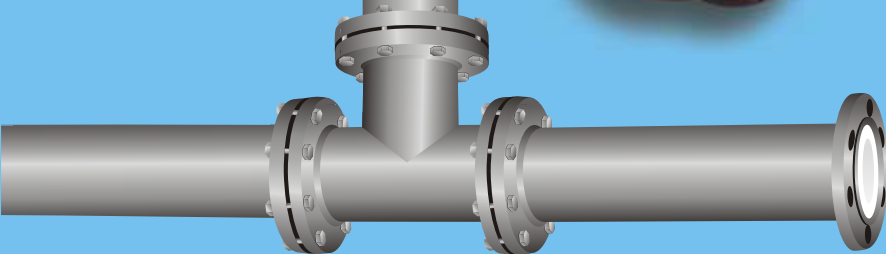


DufLine[®] PTFE Lined Pipe Systems

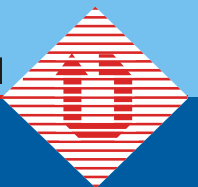


Chemical Resistane Guide



www.duflon.com

DuFlon Polymers Private Limited



Chemical Resistance Guide

DuFlon offers an extensive chemical resistance chart available on the following website @ www.brclinedtech.com. The chemical resistance chart is intended as a guide. The changes in chemical composition or special working conditions could lead to deviations. If there is any doubt about the behavior of the product under specific conditions, a test installation should be performed. The data shown is based upon information available at the time of printing.

Process Considerations

The following factors should be considered in the selection and specification of lined piping.

- 1 Process chemical to include primary and trace concentrations, contaminants, solids and particle size.
- 2 Normal and design operating pressures including minimum and maximum.
- 3 Vacuum conditions.
- 4 Normal and design operating temperatures including minimum and maximum.
- 5 Ambient Temperature for the particular region.
- 6 Cleaning methods.
- 7 Insulation or heat tracing.
- 8 Maximum flow rate and fluid velocity.
- 9 Possible upset conditions.

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
	°F	°C
1,1,2-Trichloroethane	450	230
1,2-Dibromo propane	450	230
1,4-Dioxane	450	230
1-Chloro-1-nitropropane	450	230
2,3,4,6-Tetrachlorophenol	450	230
2-Aminoisobutyric acid	450	230
Acetaldehyde	450	230
Acetamide	450	230
Acetic acid (10%)	450	230
Acetic acid (5%)	450	230
Acetic acid (50%)	450	230
Acetic acid (80%)	450	230
Acetic acid--glacial	450	230
Acetic anhydride	450	230
Acetone (10%)	450	230
Acetone (100%)	450	230
Acetonitrile	450	230
Acetophenone	450	230
Acetyl chloride	450	230
Acetylene	450	230
Acetylene tetrabromide	450	230
Acetylene tetrachloride	450	230
Acrylonitrile	450	230
Adipic acid	450	230
Air	450	230
Allyl alcohol	450	230
Allyl chloride	450	230
Alum	450	230
Alum, ammonium	450	230
Alum, chrome	450	230
Alum, potassium	450	230
Aluminum chloride (aqueous)	450	230
Aluminum fluoride	450	230
Aluminum hydroxide	450	230
Aluminum nitrate	450	230
Aluminum oxychloride	450	230
Aluminum sulfate	450	230
Ammonia (anhydrous gas)	450	230
Ammonia (anhydrous liquid)	450	230
Ammonium acetate (saturated)	450	230
Ammonium beryllium fluoride	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
	°F	°C
Ammonium bifluoride	450	230
Ammonium bromide (50%)	450	230
Ammonium carbonate (saturated)	450	230
Ammonium chloride (saturated)	450	230
Ammonium dichromate	450	230
Ammonium fluoride (10%)	450	230
Ammonium fluoride (25%)	450	230
Ammonium fluoride (saturated)	450	230
Ammonium hydroxide (1%)	450	230
Ammonium hydroxide (10%)	450	230
Ammonium hydroxide (conc.)	450	230
Ammonium metaphosphate	450	230
Ammonium nitrate (saturated)	450	230
Ammonium persulfate	450	230
Ammonium phosphate	450	230
Ammonium sulfate (saturated)	450	230
Ammonium sulfide	450	230
Ammonium thiocyanate	450	230
Amyl acetate	450	230
Amyl alcohol	450	230
Amyl chloride	450	230
Aniline	450	230
Aniline hydrochloride (10%)	450	230
Antimony trichloride	450	230
Aqua regia	450	230
ar-Tribromoethylbenzene	450	230
Arsenic acid	450	230
Aryl sulfonic acids	450	230
Barium carbonate	450	230
Barium chloride	450	230
Barium hydroxide	450	230
Barium sulfate	450	230
Barium sulfide	450	230
Beet sugar liquors	450	230
Benzaldehyde	450	230
Benzalkonium chloride	450	230
Benzenesulfonic acid	450	230
Benzoic acid	450	230
Benzyl alcohol	450	230
Benzyl amine	450	230
Bis (2-Butoxyethyl) phthalate	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
Bismuth carbonate	450	230
Black liquor	450	230
Borax	450	230
Boric acid	450	230
Brine (acid)	450	230
Brine (basic)	450	230
Brine (chlorinated acid)	450	230
Bromine (dry gas)	450	230
Bromine (water-3% saturated)	450	230
Bromine chloride (dry gas)	275	135
Bromine chloride water (8%)	450	230
Butadiene	450	230
Butane	450	230
Butanediol	450	230
Butanol (Butyl alcohol)	450	230
Butyl acetate	450	230
Butyl acrylate	450	230
Butyl mercaptan	450	230
Butyl phthalate	450	230
Butylene (butadiene)	450	230
Butyraldehyde	450	230
Butyric acid	450	230
Calcium bisulfide	450	230
Calcium bisulfite	450	230
Calcium bisulfite bleach liquor (6% total SO ₂)	450	230
Calcium carbonate	450	230
Calcium chlorate	450	230
Calcium chloride (saturated)	450	230
Calcium chlorite	450	230
Calcium hydroxide (saturated)	450	230
Calcium hypochlorite	450	230
Calcium nitrate	450	230
Calcium oxide	450	230
Calcium oxide-sulfur	450	230
Calcium sulfate	450	230
Calcium sulfide	450	230
Cane sugar liquors	450	230
Caprylic acid	450	230
CARBITOL ethylene glycol ethers	450	230
Carbolic acid (see Phenol)	--	--
Carbon bisulfide	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
Carbon dioxide (gas)	450	230
Carbon disulfide (liquid)	450	230
Carbon monoxide	450	230
Carbon tetrachloride	450	230
Carbon tetrachloride (wet gases)	450	230
Carbonic acid	450	230
Castor oil	450	230
Chloral (10%)	450	230
Chloral hydrate	450	230
Chlorinated phenol	450	230
Chlorine gas (dry)	300	150
Chlorine gas (wet)	300	150
Chlorine water (saturated)	450	230
Chloroacetic acid	450	230
Chloroacetyl chloride	450	230
Chlorosulfonic acid (100%)	450	230
Chromic acid (50%)	450	230
Chromium plating solution	450	230
Citric acid	450	230
CLOROX bleach solution (5.5% NaOCl)	450	230
Coal gas	450	230
Copper carbonate, basic	450	230
Copper chloride (saturated)	450	230
Copper cyanide (10%)	450	230
Copper nitrate	450	230
Copper sulfate (saturated)	450	230
Cresylic acid (50%)	450	230
Croton aldehyde	450	230
Cupric chloride (saturated)	450	230
Cyanoacetic acid	450	230
Cyclohexane	450	230
Cyclohexanol	450	230
Cyclohexanone	450	230
Di-B(3,4-dihydroxyphenol aniline)	450	230
Diacetone alcohol	450	230
Diazo salts	450	230
Dibutoxy ethyl phthalate	450	230
Dibutyl phthalate	450	230
Dibutyl sebacate	450	230
Dichloroacetic acid	450	230
Dichloroethane	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
Dichloropropionic acid	450	230
Diethanol amine	450	230
Diethyl amine (aqueous)	450	230
Diethyl malonate	450	230
Diethylene triamine	450	230
Diglycolic acid	450	230
Dimethanolamine	450	230
Dimethyl acetamide	450	230
Dimethyl amine (aqueous)	450	230
Dimethyl aniline	450	230
Dimethyl formamide	450	230
Dimethyl phthalate	450	230
Dimethyl sulfate	450	230
Diocetyl phthalate	450	230
Disodium phosphate	450	230
Distilled water	212	100
DOWANOL glycol ethers	450	230
Ethyl acetate	450	230
Ethyl acetoacetate	450	230
Ethyl acrylate	450	230
Ethyl alcohol	450	230
Ethyl benzene (acidic)	450	230
Ethyl chloroacetate	450	230
Ethyl cyanoacetate	450	230
Ethylene diamine	450	230
Ethylene oxide (5% aqueous)	450	230
Fatty acids	450	230
Ferric nitrate	450	230
Ferric sulfate	450	230
Ferrous nitrate	450	230
Ferrous sulfate	450	230
Fluorine (gaseous)	NR	NR
Fluoroboric acid	450	230
Fluorosilicic acid	450	230
Formaldehyde (37%)	450	230
Formaldehyde (50%)	450	230
Formic acid	450	230
FREON Fluorocarbons	450	230
Furfural	450	230
Gallic acid	450	230
Gas (manufactured)	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
Gas (natural)	450	230
Gasoline (leaded)	450	230
Gasoline (unleaded)	450	230
Gelatin	450	230
Glycerol triacetate	450	230
Glycine (saturated)	450	230
Glycolic acid	450	230
Heptane	450	230
Hexane	450	230
Hydrazine dihydrochloride	450	230
Hydriodic acid	450	230
Hydrobromic acid (10%)	450	230
Hydrobromic acid (50%)	450	230
Hydrochloric acid (10%)	450	230
Hydrochloric acid (20%)	450	230
Hydrochloric acid (35%)	450	230
Hydrocyanic acid	450	230
Hydrofluoric acid (100%)	450	230
Hydrofluoric acid (20%)	450	230
Hydrofluoric acid (30%)	450	230
Hydrofluoric acid (37%)	450	230
Hydrofluoric acid (48%)	450	230
Hydrofluoric acid (60%)	450	230
Hydrofluorosilicic acid	450	230
Hydrogen chloride (dry gas)	450	230
Hydrogen cyanide	450	230
Hydrogen fluoride gas	450	230
Hydrogen sulfide (water sol.)	450	230
Hypo (sodium thiosulfate)	450	230
Hypochlorous acid	450	230
Iodine (gas)	450	230
Isopropyl alcohol	450	230
Isopropylamine	450	230
Lactic acid (80%)	450	230
Lard oil	450	230
Lauric acid	450	230
Lauryl chloride	450	230
Lauryl sulfate (saturated)	450	230
Lead acetate	450	230
Linoleic acid	450	230
Lithium bromide (saturated)	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
	450	230
Lubricating oil	450	230
Magnesium carbonate	450	230
Magnesium chloride	450	230
Magnesium hydroxide	450	230
Magnesium nitrate	450	230
Magnesium sulfate (10%-saturated)	450	230
Maleic acid (10%)	450	230
Maleic anhydride	450	230
Malic acid	450	230
Manganese sulfate (10% to saturated)	450	230
Manganese sulfate (saturated)	450	230
Mercuric cyanide	450	230
Mercuric nitrate	450	230
Methacrylic acid	450	230
Methane	450	230
Methane sulfonic acid	450	230
Methoxy ethyl oleate	450	230
Methyl alcohol	450	230
Methyl cyanoacetate	450	230
Methyl methacrylate	450	230
Methyl salicylate	450	230
Methyl sulfuric acid	450	230
Methyl trichlorosilane	450	230
Mineral oil	450	230
Molasses	450	230
Monoethanolamine	450	230
Naphtha	450	230
Naphthalene	450	230
Nickel nitrate	450	230
Nickel sulfate	450	230
Nicotinic acid	450	230
Nitric acid (30%)	450	230
Nitric acid (5-10%)	450	230
Nitric acid (50%)	450	230
Nitric acid (70%-fuming)	450	230
Nitromethane	450	230
Nitrous acid (10%)	450	230
Octane	450	230
Oils and fats	450	230
Oleic acid	450	230
Oxalic acid	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
	450	230
Palmitic acid	450	230
Perchloric acid (10%)	450	230
Perchloric acid (70%)	450	230
Petrolatum	450	230
Phenolsulfonic acid (65%)	450	230
Phenyl glycine potassium salt	450	230
Phenylhydrazine	450	230
Phenylhydrazine hydrochloride	450	230
Phosphoric acid (10%–50%)	450	230
Phosphoric acid (50%–85%)	450	230
Phosphorus pentachloride	450	230
Photographic solutions	450	230
Phthalic acid	450	230
Picric acid	450	230
Plating Solutions (Brass)	450	230
Plating Solutions (Cadmium)	450	230
Plating Solutions (Chrome)	450	230
Plating Solutions (Copper)	450	230
Plating Solutions (Gold)	450	230
Plating Solutions (Iron)	450	230
Plating Solutions (Lead)	450	230
Plating Solutions (Nickel)	450	230
Plating Solutions (Rhodium)	450	230
Plating Solutions (Silver)	450	230
Plating Solutions (Speculum)	450	230
Plating Solutions (Tin)	450	230
Plating Solutions (Zinc)	450	230
Polyvinyl acetate	450	230
Polyvinyl alcohol	450	230
Potassium acetate	--	--
Potassium aluminum chloride	450	230
Potassium aluminum sulfate 50%	450	230
Potassium bicarbonate	450	230
Potassium borate	450	230
Potassium bromate	450	230
Potassium bromide	450	230
Potassium carbonate	450	230
Potassium chlorate (aqueous)	450	230
Potassium chloride	450	230
Potassium chromate	450	230
Potassium cyanide	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
Potassium dichromate	450	230
Potassium ferricyanide (saturated)	450	230
Potassium ferrocyanide	450	230
Potassium fluoride	450	230
Potassium hydroxide (10%)	450	230
Potassium hydroxide (50%)	450	230
Potassium hydroxide (60–90%)	450	230
Potassium hypochlorite	450	230
Potassium iodide	450	230
Potassium nitrate	450	230
Potassium perborate	450	230
Potassium perchlorate	450	230
Potassium permanganate (saturated)	450	230
Potassium persulfate	450	230
Potassium sulfate	450	230
Potassium sulfide	450	230
Propane	450	230
Propyl alcohol	450	230
Salicylaldehyde	450	230
Salicylic acid	450	230
Sea water	212	100
Selenic acid (aqueous)	450	230
Silver cyanide	450	230
Silver nitrate	450	230
Soap solution (saturated)	450	230
Sodium acetate	450	230
Sodium benzoate	450	230
Sodium bicarbonate	450	230
Sodium bisulfate	450	230
Sodium borate (borax)	450	230
Sodium carbonate	450	230
Sodium chlorate	450	230
Sodium cyanide (saturated)	450	230
Sodium dichromate	450	230
Sodium ferricyanide	450	230
Sodium ferrocyanide	450	230
Sodium fluoride (saturated)	450	230
Sodium nitrate	450	230
Sodium phosphate	450	230
Sodium silicate	450	230
Sodium sulfate	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
Sodium thiosulfate (Hypo)	450	230
Stannic chloride	450	230
Stannous chloride (50%)	450	230
Steam	450	230
Stearic acid	450	230
Stoddard solvent	450	230
Succinic acid	450	230
Sugar syrup	450	230
Sulfamic acid	450	230
Sulfur dioxide (dry or wet gas)	450	230
Sulfur trioxide (liquid or gas)	450	230
Sulfuric acid (>98%–fuming)	450	230
Sulfuric acid (10%)	450	230
Sulfuric acid (16%)	450	230
Sulfuric acid (30%)	450	230
Sulfuric acid (60%)	450	230
Sulfuric acid (60%–sat. with CL2)	450	230
Sulfuric acid (85%)	450	230
Sulfuric acid (93%)	450	230
Sulfuric acid (96%)	450	230
Sulfuric acid (98%)	450	230
Sulfurous acid	450	230
Tall oil	450	230
Tallow	450	230
Tannic acid	450	230
Tartaric acid	450	230
Tetraethyl lead	450	230
Tetrahydrofuran	450	230
Thread cutting oils	450	230
Titanium tetrachloride	450	230
Tomato juice	450	230
Toxaphene (90%) + xylene (10%)	450	230
Tributyl citrate	450	230
Tributyl phosphate	450	230
Trichloroacetic acid (10%)	450	230
Trichloroacetic acid (100%)	450	230
Trichloromethane (chloroform)	450	230
Tricresyl phosphate	450	230
Triethanolamine	450	230
Triethylamine	450	230
Trimethyl propane	450	230

CHEMICAL	MAXIMUM SERVICE TEMPERATURE OF PTFE	
Trimethylamine	450	230
Trisodium phosphate	450	230
Urea	450	230
Vegetable oil	450	230
Vinegar	450	230
Vinyl acetate	450	230
Water--acid mine	212	100
Water--deionized	212	100
Water--demineralized	212	100
Water--distilled	212	100
Water--fresh	212	100
Water--salt	212	100
Water--sewage	212	100
Zinc nitrate	450	230
Zinc sulfate	450	230

DufLine

PTFE Lined Piping Systems



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