

Chemical Compatibility Chart

This Chemical Compatibility Chart is provided as a quick reference for determining likely compatibility issues with various materials. Each application presents different possible chemical interactions. Before permanent installation, test equipment with the intended chemicals under the specific conditions of your application.

The information provided in this chart has been supplied to Tecan Systems by other reputable sources and is to be used only as a guideline. Tecan Systems does not warrant, either expressly or by implication, that the information in this chart is accurate or complete, nor that the materials are suitable for any particular purpose.



Caution! Failure to test chemicals used in individual applications may result in damage to the pump and/or test results.



DANGER! Variations in chemical behavior during handling due to factors such as temperature, pressure and concentration can cause equipment to fail, even if it passed initial testing. **SERIOUS INJURY MAY RESULT.** Use suitable guards and/or personal protection when handling chemicals.

Table 1 Wetted Materials Used in Tecan Pumps

Telfon® (PTFE, TFE, FEP)	Ceramic (Alumina)	UHMWPE	Valve body	Valves and syringes
Kel F®	Polypropylene	Tubing, valve plug, syringe seals	Fittings for tubing	Long-life syringe seals

Ratings – Chemical Effect

The following letter codes are used in Table 2 to indicate these ratings:

- A = Excellent.
- B = Good – Minor Effect, slight corrosion or discoloration.
- C = Fair – Moderate Effect, not recommended for continuous use. Softening, loss of strength, swelling may occur.
- D = Severe Effect, not recommended for **ANY** use.
- N/A = Information not available.

Explanation of Footnotes

Numbers associated with letter ratings in Table 2 provide thermal performance ranges.

1. Satisfactory to 72°F (22°C)
2. Satisfactory to 120°F (48°C)

For example, an entry that reads “A1” indicates a chemical effect of “Excellent” and a thermal performance range of up to 72°F (22°C).

Table 2 Chemical Resistance Chart

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Acetaldehyde		A	A	C1			
Acetamide		A	A	A2			
Acetate Solvent		A1	A	C1			
Acetic Acid		A	A	A2			
Acetic Acid 20%		A	A	A2			
Acetic Acid 80%		A	A	A2			
Acetic Acid, Glacial		A2	A	A2			
Acetic Anhydride		A	A	B2			
Acetone		A	A	A			
Acetyl Chloride (dry)		A	A	D			
Acetylene		A	A	D			
Acrylonitrile		N/A	A	B2			
Adipic Acid		N/A	A	B2			
Alcohols:Amyl		A	A	A			
Alcohols:Benzyl		A	A	A			
Alcohols:Butyl		N/A	A	A2			
Alcohols:Diacetone		B1	A	A1			
Alcohols:Ethyl		A	A	A1			
Alcohols:Hexyl		N/A	A	A1			
Alcohols:Isobutyl		N/A	A2	A2			
Alcohols:Isopropyl		N/A	A2	A			
Alcohols:Methyl		A1	A	A1			
Alcohols:Octyl		N/A	N/A	A			
Alcohols:Propyl		N/A	A	A			
Aluminum Chloride		A	A	A			
Aluminum Chloride 20%		A	A	A			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Aluminum Fluoride		N/A	A	A			
Aluminum Hydroxide		A1	A	A			
Aluminum Nitrate		A1	A	A1			
Aluminum Potassium Sulfate 100%		A	A	A			
Aluminum Sulfate		A	A	A			
Amines (General)		A	A2	B2			
Ammonia, anhydrous		A	A	A			
Ammonia, Aqueous		A	A	A			
Ammonia Nitrate		N/A	A	A1			
Ammonium Acetate		N/A	A	A2			
Ammonium Bifluoride		N/A	A	A			
Ammonium Carbonate		N/A	A	A			
Ammonium Chloride		A	A	A			
Ammonium Hydroxide		A	A	A			
Ammonium Nitrate		A	A	A			
Ammonium Oxalate		N/A	N/A	A1			
Ammonium Persulfate		A	A	B2			
Ammonium Phosphate, Dibasic		A	A2	B			
Ammonium Phosphate, Monobasic		N/A	A	B			
Ammonium Phosphate, Tribasic		N/A	A	B			
Ammonium Sulfate		A	A	B			
Ammonium Thiosulfate		N/A	N/A	N/A			
Amyl Acetate		A1	A	B2			
Amyl Alcohol		A	A	B			
Amyl Chloride		A	A	B			
Aniline		A2	A	B			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Aniline Hydrochloride		N/A	A	B1			
Antifreeze		N/A	N/A	B			
Antimony Trichloride		A	A	B1			
Aqua Regia (80% HCl, 20% HNO ₃)		A	A	C1			
Arochlor 1248		A1	A	D			
Aromatic Hydrocarbons		N/A	N/A	D2			
Arsenic Acid		N/A	A	A			
Arsenic Salts		N/A	N/A	B1			
Asphalt		A	A1	A2			
Barium Carbonate		A	A	A			
Barium Chloride		A	A	A			
Barium Cyanide		N/A	A1	D			
Barium Hydroxide		A	A	A			
Barium Nitrate		A	A	A			
Barium Sulfate		A	A	A			
Barium Sulfide		N/A	A	A			
Benzaldehyde		A	A1	A1			
Benzene		B	A	B1			
Benzene Sulfonic Acid		N/A	A	B1			
Benzoic Acid		A	A2	A2			
Benzol		A	A	A2			
Benzonitrile		A2	A2	A1			
Benzyl Chloride		N/A	N/A	A2			
Bleach Solutions		A	A	C1			
Borax (Sodium Borate)		A	A	A			
Boric Acid		A	A	A			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Bromine Water		A	A	C1			
Butadiene		A	A2	B1			
Butane		A	A	D			
Butanol (Butyl Alcohol)		A1	A2	B2			
Butyl Amine		D	A2	B1			
Butyl Ether		A1	A1	D			
Butyl Phthalate		A1	A2	B			
Butylacetate		A1	A	D			
Butylene		B1	A	D			
Butyric Acid		A	A	A2			
Calcium Bisulfate		N/A	N/A	A1			
Calcium Bisulfide		A	A	A			
Calcium Bisulfite		A	A	A			
Calcium Carbonate		N/A	A	A			
Calcium Chloride		A	A	A			
Calcium Hydroxide		A	A	A			
Calcium Hypochlorite		B1	A	A			
Calcium Nitrate		A1	A2	A			
Calcium Oxide		N/A	A	A			
Calcium Sulfate		A	A	A			
Carbon Bisulfide		N/A	N/A	D			
Carbon Tetrachloride		A1	A	D			
Carbon Tetrachloride (dry)		D	A	D			
Carbon Tetrachloride (wet)		A1	A	B1			
Carbonated Water		N/A	A	A1			
Carbonic Acid		A	A	A			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Chloric Acid		A	A	D			
Chlorine Water		A	A	A			
Chlorine, Anhydrous Liquid		B2	A	D			
Chloroacetic Acid		A2	A	A2			
Chlorobenzene (Mono)		A1	B	D			
Chlorobromomethane		N/A	A	A1			
Chloroform		A1	A1	D			
Chlorosulfonic Acid		A2	A	D			
Chromic Acid 10%		A	A	A1			
Chromic Acid 30%		A	A	A1			
Chromic Acid 5%		A	A	A1			
Chromic Acid 50%		A2	A	B2			
Citric Acid		A2	A	A			
Citric Oils		N/A	N/A	A1			
Clorox® (Bleach)		A	A	A2			
Copper Chloride		A	A	A			
Copper Cyanide		N/A	A	A			
Copper Nitrate		A	A	A			
Copper Sulfate >5%		A	A	A			
Copper Sulfate 5%		A	A	A			
Cresols		A1	N/A	D			
Cresylic Acid		N/A	A	D			
Cupric Acid		A2	A	B2			
Cyanoic Acid		N/A	A	N/A			
Cyclohexane		A	A	D			
Cyclohexanone		A1	A	C1			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Detergents		A	A	A			
Diacetone Alcohol		B1	A	A1			
Dichlorobenzene		N/A	A	B1			
Dichloroethane		A2	A1	D			
Diesel Fuel		A1	A	C1			
Diethyl Ether		C	A	D			
Diethylamine		A1	A	B1			
Diethylene Glycol		N/A	A	A			
Dimethyl Aniline		A	A	A2			
Dimethyl Formamide		A2	A	A2			
Diphenyl		B1	A	D			
Diphenyl Oxide		N/A	A	D			
Epsom Salts (Magnesium Sulfate)		A	A	A			
Ethane		A1	A	D			
Ethanol		A	A	A			
Ethanolamine		D	A1	A1			
Ether		B1	A	D			
Ethyl Acetate		A1	A	A			
Ethyl Benzoate		A1	A	D			
Ethyl Ether		A1	A	D			
Ethyl Sulfate		A	A	D			
Ethylene Bromide		B	A	D			
Ethylene Chloride		A1	A	D			
Ethylene Chlorohydrin		A	A	B1			
Ethylene Diamine		D	A	B2			
Ethylene Dichloride		A1	A	D			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Ethylene Glycol		A	A	A			
Ethylene Oxide		A2	A	C1			
Fatty Acids		A	A	A			
Ferric Chloride		A2	A	A			
Ferric Nitrate		A1	A	A			
Ferric Sulfate		A1	A	A			
Ferrous Chloride		B1	A	A			
Ferrous Sulfate		N/A	A	A			
Fluoboric Acid		B1	A	A			
Fluorine Liquid		N/A	N/A	D			
Fluorosilicic Acid		A1	A	A			
Formaldehyde 100%		N/A	A	A			
Formaldehyde 40%		A	A	A			
Formic Acid		A	A	A1			
Freon 113		A1	A	D			
Freon 12		A1	A	A1			
Freon 22		A1	A	A1			
Freon® 11		A1	A	A1			
Fuel Oils		A	A	B1			
Furan Resin		A1	A	D			
Furfural		D	A	D			
Gallic Acid		A1	A	A			
Gasoline (high-aromatic)		A1	A	A1			
Glucose		N/A	A	A			
Glycerin		A	A	A			
Glycolic Acid		A1	A	A			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Heptane		A	A	D			
Hexane		A	A	C1			
Hydraulic Oil (Petro)		A1	A	D			
Hydrazine		N/A	A	D			
Hydrobromic Acid 100%		A	A	D			
Hydrobromic Acid 20%		A	A	A			
Hydrochloric Acid 100%		A	A	A1			
Hydrochloric Acid 20%		A	A	A2			
Hydrochloric Acid 37%		A	A	A2			
Hydrofluoric Acid 100%		B	A	D			
Hydrofluoric Acid 20%		A	A	B			
Hydrofluosilicic Acid 100%		B	A	A			
Hydrofluosilicic Acid 20%		A	A	A			
Hydrogen Peroxide 10%		A	A	A1			
Hydrogen Peroxide 100%		B	A	D			
Hydrogen Peroxide 30%		B	A	A1			
Hydrogen Peroxide 50%		A	A	C2			
Hydrogen Sulfide (Aqueous)		A1	A	B2			
Hydroxyacetic Acid 70%		A1	A	A			
Iodine		A1	A	A1			
Iodine (in alcohol)		NA	A	A1			
Isooctane		A1	A	A1			
Isopropyl Acetate		N/A	A	B1			
Isopropyl Ether		A1	A	D			
Kerosene		A	A	B1			
Ketones		A1	A	B1			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Lacquer Thinners		A2	A	D			
Lacquers		A1	A	D			
Lactic Acid		A	A	A			
Lead Acetate		A	A	A			
Lead Nitrate		N/A	A	A			
Lead Sulfamate		N/A	B	A2			
Ligroin		N/A	A	D			
Linoleic Acid		N/A	A	D			
Lithium Chloride		N/A	A	A2			
Lithium Hydroxide		N/A	A	A2			
Lye: Ca(OH) ₂ Calcium Hydroxide		A2	A	A2			
Magnesium Bisulfate		N/A	A	A2			
Magnesium Carbonate		N/A	A1	A			
Magnesium Chloride		A	A	A			
Magnesium Hydroxide		A1	A	A			
Magnesium Nitrate		N/A	A	A			
Magnesium Oxide		N/A	A	N/A			
Magnesium Sulfate (Epsom Salts)		A	A	A			
Maleic Acid		N/A	A	A			
Maleic Anhydride		N/A	A	D			
Malic Acid		N/A	A	B			
Manganese Sulfate		A1	A	A			
Mercury		A1	A	A			
Methanol (Methyl Alcohol)		A2	A	A1			
Methyl Acetate		A1	A	B1			
Methyl Acetone		N/A	A	N/A			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Methyl Acrylate		A1	A	C1			
Methyl Bromide		A1	A	D			
Methyl Butyl Ketone		N/A	A	D			
Methyl Cellosolve		N/A	A	A2			
Methyl Chloride		A1	A	D			
Methyl Dichloride		N/A	A	N/A			
Methyl Ethyl Ketone		A1	A	A1			
Methyl Isobutyl Ketone		A	A	D			
Methyl Isopropyl Ketone		N/A	A	D			
Methyl Methacrylate		N/A	A	A			
Methylamine		A1	A	D			
Methylene Chloride		A1	A	D			
Mineral Spirits		A1	A	D			
Monochloroacetic acid		A2	A	A2			
Monoethanolamine		D	A	A1			
Morpholine		A1	A	N/A			
Motor oil		A	A	A1			
Naphthalene		A	A	B1			
Nickel Chloride		A2	A	A1			
Nickel Nitrate		A2	A	A			
Nickel Sulfate		A	A	A			
Nitric Acid (20%)		A1	A	A1			
Nitric Acid (50%)		A1	A	A1			
Nitric Acid (5-10%)		A1	A	A			
Nitric Acid (Concentrated)		A1	A	D			
Nitrobenzene		A	A	B1			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Nitrous Acid		B	A	D			
Oil Crude, Sour		A	A	B1			
Oil Crude, Sweet		A	A	C1			
Oil Mineral		A	A	A1			
Oleic Acid		A1	A	B2			
Oleum 100%		A1	A	D			
Oxalic Acid (cold)		A	A	A2			
Ozone		A1	A	D			
Palmitic Acid		N/A	A	A1			
Perchloroethylene		A1	A	D			
Petrolatum		N/A	A	B2			
Petroleum		A	A	B2			
Phenol (10%)		A	A	A1			
Phosphoric Acid (>40%)		A	A	A			
Phosphoric Acid (40%)		A	A	A			
Phosphoric Acid (crude)		A2	A	A1			
Phosphoric Acid Anhydride		N/A	A	A1			
Phosphorus		N/A	A	B1			
Phosphorus Trichloride		A	A	D			
Photographic Developer		A	A	A2			
Photographic Solutions		A	A	A			
Phthalic Acid		N/A	A	A1			
Phthalic Anhydride		A	A	D			
Picric Acid		A1	A	A1			
Potash (Potassium Carbonate)		A1	A	A			
Potassium Bicarbonate		A2	A	A1			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Potassium Bromide		A1	A	A			
Potassium Chlorate		A2	A	A			
Potassium Chloride		A2	A	A			
Potassium Chromate		N/A	A	A			
Potassium Cyanide Solutions		A1	A	A			
Potassium Ferricyanide		A1	A	A			
Potassium Ferrocyanide		A1	A	A			
Potassium Hydroxide (Caustic Potash)		A1	A	A			
Potassium Hypochlorite		A1	A	B			
Potassium Iodide		N/A	A	A			
Potassium Nitrate		A1	A	A			
Potassium Oxalate		N/A	A	A1			
Potassium Permanganate		A1	A	A1			
Potassium Sulfate		A1	A	A			
Potassium Sulfide		A1	A	A			
Propane (liquefied)		A1	A	B			
Pyridine		A1	A	A1			
Pyrogalllic Acid		A1	A	A1			
Resorcinal		A1	A	A2			
Salicylic Acid		A1	A2	A2			
Salt Brine (NaCl saturated)		A	A2	A			
Sea Water		A	A	A			
Silver Bromide		A	A2	N/A			
Silver Nitrate		A1	A	A			
Soap Solutions		N/A	A	A			
Sodium Acetate		A1	A	A			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Sodium Aluminate		N/A	A	A1			
Sodium Benzoate		N/A	A	A			
Sodium Bicarbonate		A	A	A			
Sodium Bisulfate		A2	A	A			
Sodium Bisulfite		A1	A	A			
Sodium Borate (Borax)		A	A	A			
Sodium Bromide		A1	A	A			
Sodium Carbonate		A	A	A			
Sodium Chlorate		A1	A	A			
Sodium Chloride		A1	A	A			
Sodium Chromate		A1	A	A			
Sodium Cyanide		A1	A	A			
Sodium Ferrocyanide		N/A	A	A			
Sodium Fluoride		A1	A1	A			
Sodium Hydrosulfite		N/A	A	A			
Sodium Hydroxide (20%)		A	A	A			
Sodium Hydroxide (50%)		A	A	A			
Sodium Hydroxide (80%)		A	A	A			
Sodium Hypochlorite (<20%)		A	A	A2			
Sodium Hypochlorite (100%)		A	A	A1			
Sodium Hyposulfite		A	A	A			
Sodium Metaphosphate		N/A	A	A			
Sodium Metasilicate		N/A	A	A			
Sodium Nitrate		A1	A	A			
Sodium Perborate		A1	A	A			
Sodium Peroxide		A1	A	A			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Sodium Polyphosphate		N/A	A	A			
Sodium Silicate		A1	A	A			
Sodium Sulfate		A	A	A			
Sodium Sulfide		A1	A	A			
Sodium Sulfite		N/A	N/A	A			
Sodium Tetraborate		A	A	A			
Sodium Thiosulfate (hypo)		A	A	A			
Stannic Chloride		A	A	A			
Stannous Chloride		A1	A	A			
Starch		A1	A	A			
Stearic Acid		N/A	A	A1			
Styrene		N/A	A	D			
Sulfur Chloride		A1	A	D			
Sulfur Dioxide		N/A	A	C1			
Sulfur Trioxide		A1	A	D			
Sulfuric Acid (10-75%)		A	A	A			
Sulfuric Acid (75-100%)		A	A	B1			
Sulfurous Acid		A1	A	A2			
Sulfuryl Chloride		N/A	A	D			
Tartaric Acid		A2	A	A			
Tetrachloroethane		A1	A	C1			
Tetrachloroethylene		A1	A	D			
Tetrahydrofuran		A1	A	C1			
Toluene (Toluol)		B2	A	D			
Trichloroacetic Acid		A1	A	A2			
Trichloroethane		A1	A	D			

Table 2 Chemical Resistance Chart (continued)

Chemical	Alumina Ceramic	Kel-F	Teflon	Polypropylene	UHMWPE	PharMed Tubing	PPS
Trichloroethylene		B2	A	D			
Trichloropropane		A1	A1	N/A			
Tricresylphosphate		N/A	A	A1			
Triethylamine		A1	A	D			
Trisodium Phosphate		N/A	A	A			
Turpentine		A	A	D			
Urea		N/A	A	A			
Uric Acid		N/A	A	A1			
Urine		N/A	A1	A			
Varnish		A	A	A1			
Vinyl Acetate		N/A	A2	D			
Vinyl Chloride		N/A	A2	D			
Water, Deionized		A1	A2	A			
Water, Distilled		A	A	A			
Water, Fresh		A	A	A			
Water, Salt		A	A	A			
Xylene		A	A	C1			
Zinc Chloride		A1	A	A			
Zinc Hydrosulfite		N/A	A1	A1			
Zinc Sulfate		A	A	A			