PEEK & Polymer Chemical Resistance

PEEK exhibits excellent resistance to a wide range of organic and inorganic chemicals. The compatibility of PEEK with many chemicals at 20 °C (68 °F) has been investigated and the results for unreinforced grades are given in the table below.

PEEK is compatible with almost any of the solvents used in HPLC. The only solvent which will attack PEEK are concentrated nitric acid and sulphuric acids. However, PEEK tubing can safely withstand 20–30% nitric acid when passivating a system.

Methylenechloride, DMSO and THF may cause swelling in PEEK. The highest temperature we recommend for PEEK is 100 °C. Up to this temperature the tubing will maintain the pressure rating stated.

A = Suitable
B = Marginal-dependent on application
C = Not recommended

PEEK and Polymer chemical resistance

Resistance at 20 °C	PEEK	Poly-ethylene	Poly-propylene	PPS	PVDF	PTFE	ETFE
Acetaldehyde	A						
Acetic acid (20%)	A	A	A	A	A	A	A
Acetic acid (80%)	A	A	A	A	B	A	
Acetic acid (glacial)	A	A	A	A	A	A	A
Acetone	A	B	A	A	C	A	A
Acetonitrile	A			A		A	A
Acrylic acid	A			A			
Ammonia, anhydrous	A			A			
Ammonia (10%)	A	B	A	A	A	A	A
Ammonia (Liquid)	B			A			
Ammonium hydroxide	A	A	A	A	A	A	A
Aqua regia	C			C			
Aromatic hydrocarbons	A	B	C	A			
Benzene	A	B	C	A	A	A	A
Benzoic acid	A			A			
Benzaldehyde	A			A			
Bromine/dibromoethane	C			C			
Bromine (dry)	C			C			
Bromine (wet)	C			C			
Boric acid	A			A			
Butanol	A	A	A	A	A	A	A
Calcium hydroxide	A			A			
Carbon tetrachloride	A			A			
Chlorine (gas)	A			C			
Chlorine (liquid)	C			C			
Chloroacetic acid	A	B	B	A	A	A	A
Chlorobenzene	A			A			
Chloroform	A	B	B	A	A	A	A
Cyclohexane	A	B	C	A	A	A	A
Cyclohexanone	A	C	C	A	C	A	A
Diethylamine	A	C	A		C	A	A
Diethylether	A			A			
Diethylformamide	A	A	A	A	C	A	A
Dioxane	A			A			A
Ethanol	A	B	A	A		A	A
Ether	A	B	C	A	B	A	A
Ethyl acetate	A	B	A	A	C	A	A
Ethylene chloride		B	B	A	A	A	A
Ethylene glycol	A	A	A	A	A	A	A
Heptane	A	B	B	A	A	A	A
Hexane	A	B	B	A	A	A	A
Hydrobromic acid (100%)	C	B	B	A	A	A	

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PEEK & Polymer Chemical Resistance (cont.)

PEEK and Polymer chemical resistance

Resistance at 20 °C	PEEK	Poly-ethylene	Poly-propylene	PPS	PVDF	PTFE	ETFE
Hydrobromic acid (20%)	C	B	A		A	A	A
Hydrochloric acid (100%)	A		B	C	A	A	A
Hydrochloric acid (20%)	A	A	B	C	A	A	A
Hydrofluoric acid (100%)	C		B	C	A	A	A
Hydrofluoric acid (20%)		A	A	A	A	A	A
Hydrogen peroxide (100%)	A	B	B	C	A	A	
Hydrogen peroxide (50%)	A	B	B		A	A	A
Hydrogen peroxide (10%)	A	A	A	A	A	A	A
Iso-octane	A		A	A	A	A	
Isopropanol	A	A	A	A		A	
Isopropyl ether		A	B		C	A	
Ketones	A	B	B	A	B	A	
Methanol	A	A	A	A	A	A	A
Methyl dichloride			C		C		
Methyl ethylketone	A	B	B	A	C	A	A
Methylene chloride	B	B	B	A	B	A	A
Nitric acid (100%)	C	B	C	C	C	A	A
Nitric acid (20%)	A	B	A	C	A	A	A
Pentane	A	C	C		A	A	
Perchloric acid	A	B	B		A	A	
Phenol (dilute)	A			A			
Phenol (conc.)	C			A			
Phosphoric acid (100%)	A	B	A	A	B	A	A
Phosphoric acid (40%)	A	A	A	A	B	A	A
Potassium hydroxide (dilute)	A			A			
Potassium hydroxide (70%)	A			A			
Propanol	A						
Pyridine	A	B	A	A	C	A	A
Sodium hydroxide (80%)	A	B	A	A	C	A	
Sodium hydroxide (20%)	A	A	A	A	A	A	A
Sulphuric acid (100%)	C	B	B	A	A	A	A
Sulphuric acid (75%)	C	A	A	A	A	A	A
Sulphuric acid (40%)	A	A	A	A	A	A	A
Tetrahydrofuran	B	B	B	A	B	A	A
Toluene	A	B	B	A	A	A	A
Trichloroacetic acid	A	A	A	A	B	A	A
Trichloroethane	A		B		A	A	
Trichloroethylene	A			A			
Triethylamine			C		A	A	A
Water	A	A	A	A	A	A	A
Water (distilled)	A	A	A	A	A	A	A
Xylene	A			A			

The chemical resistance of PEEK at high temperature

Chemical	Temperature	Rating
Acetic acid	200 °C (420 °F)	B
Ethylene glycol	200 °C (420 °F)	B
Ethylene glycol (50%)	140 °C (284 °F)	A
Methylethylketone	200 °C (420 °F)	C
Nitrobenzene	200 °C (420 °F)	C
Phosphoric acid (50%)	200 °C (420 °F)	A
Sulphuric acid (50%)	200 °C (420 °F)	B
Sodium hydroxide solution	200 °C (420 °F)	A
Liquid ammonia	200 °C (420 °F)	B
Sulphur dioxide gas	200 °C (420 °F)	A
Hydrogen sulphide gas	200 °C (420 °F)	A
Carbon monoxide gas	200 °C (420 °F)	A
Ammonia gas	200 °C (420 °F)	A
Methane	200 °C (420 °F)	A