

Perspex Chemical Resistance

Perspex has very good resistance to attack by water, alkalis, aqueous inorganic salt solutions and most common dilute acids. It is difficult to generalise about the effects of organic materials on Perspex, some liquids have no effect at all, some cause swelling, crazing or weakening and some dissolve it completely.

The below table gives an indication of the chemical resistance of Perspex cast clear as judged by the visual appearance of samples of dimensions approximately 100 x 12 x 6mm immersed in typical solutions or liquids at 20°C.

The following symbols have been used in the table –

S = Satisfactory (no apparent effect apart from possible staining)

A = Some attack evident (swelling or slight crazing)

U = Unsatisfactory (the sample has dissolved, swollen, decomposed etc)

Chemical	Concentration	Resistance	Exposure Time	Notes
Acetic acid	10%	S	5 years	
	100%	U	1 day	Badly swollen
	Glacial	U	3 days	Dissolved
Acetone	100%	U	1 day	Dissolved
Alcohols, n-butyl	-	U	1 year	Crazing & disintegration
Ethyl	10%	A	1 year	Slight attack
	50%	A	1 year	Slight attack
	100%	U	1 year	Slight swelling & softening
Isopropyl	10%	A	1 year	Crazing
	50%	A	1 year	Crazing
	100%	A	1 year	Attacked
Methyl	10%	A	1 year	Slight attack
	50%	A	168 days	Swollen
	100%	U	168 days	Swollen: weight increase
Ammonia	0.880 sol	S	1 year	-
Amyl acetate	-	U	28 days	Dissolved
Aniline	-	U	7 days	Dissolved
Aviation fuel	100-octane	A	168 days	Slight crazing

Chemical	Concentration	Resistance	Exposure Time	Notes
Benzaldehyde	-	U	7 days	Dissolved
Benzene	-	U	10 days	Dissolved
Calcium chloride	Saturated sol	S	3 days	Slight attack
Carbon	-	U	84 days	Dissolving
Tetrachloride	-	-	-	-
Chloroform	-	U	1 day	Dissolved
Chlorine	2% in water	A	5 years	Surface crazing & attack
Chromic acid	10%	S	5 years	Stained
	Saturated sol	U	1 year	Dissolving
Citric acid	Saturated sol	S	5 years	-
Dibutyl phthalate	-	A	2 years	Surface crazed
Diocetyl phthalate	-	A	2 years	Slight attack
Dibutyl sebacate	-	A	2 years	Slight attack
Diethyl ether	-	U	168 days	Swollen & soft
Ethylene glycol	-	S	5 years	-
Ethylene dichloride	-	U	1 day	Dissolved
Ethyl acetate	-	U	3 days	Dissolved
Epichlorhydrin	-	U	1 day	Dissolved
Formaldehyde	40%	S	5 years	-
Formic acid	10%	S	5 years	-
	90%	U	7 days	-
Glycerol	-	S	5 years	-
Glycerine	-	-	-	-
Hexane	-	S	168 days	Slight crazing
Hydrochloric acid	10%	S	168 days	Slight crazing
	Conc	S	168 days	Slight crazing
Hydrocyanic acid	-	U	1 day	Dissolved
Hydrofluoric acid	Conc	U	1 day	Swollen & soft
Hydrogen peroxide	10 vol	S	1 year	-
	90%	U	-	-
Mercury	-	S	2 years	-
Methylene chloride	-	U	1 day	Dissolved
Methyl salicylate	-	U	7 days	Dissolved
Nitric acid	10%	S	1 year	-
Transformer oil	-	S	5 years	Staining
Diesel	-	S	1 year	Hazing
Olive	-	S	5 years	Slight crazing
Paraffin (medicinal)	-	S	5 years	-
Silicones	-	A	1 year	Swollen
Oxalic acid	Saturated sol	S	5 years	Severe crazing
Perchloroethylene	-	U	5 years	Severe crazing
Phenol	Saturated sol	U	7 days	Dissolved
Phosphoric acid	10%	S	5 years	-
	Conc	U	7 days	Severe crazing

Chemical	Concentration	Resistance	Exposure Time	Notes
Potassium dichromate	10%	S	5 years	Slight staining
Potassium hydrozide	Saturated sol	S	168 days	-
Potassium permanganate	N/10 sol	S	5 years	Severe staining
Sodium carbonate	Saturated sol	S	5 years	Severe staining
Sodium chlorate	Saturated sol	S	5 years	-
Sodium hydroxide	Saturated sol	S	5 years	-
Sodium hypochlorite	10% chloride sol	S	5 years	-
Sulphoric acid	10%	S	5 years	-
	30%	S	1 year	Slight edge attack
	Conc	U	1 day	Swollen
Tartaric acid	Saturated sol	S	5 years	-
Toluene	-	U	7 days	Dissolved
Trichloroethane	-	U	1 day	Dissolved
Trichlorethylene	-	U	1 day	Dissolved
Tricresyl phosphate	-	U	2 years	Attacked/crazed
Water	-	S	5 years	-
White spirit	-	S	5 years	Slight crazing
Xylene	-	U	7 days	Dissolved

PLEASE NOTE:

Chemical resistance tests are difficult to interpret accurately because plastic materials generally may be attacked in several ways. The table must therefore be used with discretion and should be supplemented by component tests under actual service conditions.