Chemical resistance

Chemical resistance of the piping material

Chemical resistance of the piping material Plastics are widely used not only for water, but also to handle aggressive chemicals. Consequently the determination of the fluid to be carried is therefore one of the prime concerns in the selection process. Other factors, such as the installation environment, also need to be considered. However, the usual starting point for most applications is to determine which material provides the best chemical resistance performance.

The chemical resistance of thermoplastic piping against a broad range of commonly used chemicals can be found in the chemical resistance tables, however we would recommend that in case of doubt that you contact our technical department for clarification. The data shown is based on immersion tests and is given as a guide only as no guarantees can be given in respect of the information shown. Where there is any concern over the suitability of a material, it is recommended to test using the specific working conditions in a pilot installation.

In all cases the suitability of the piping materials, jointing methods and sealing materials (elastomeric for '0' rings, and flange gaskets). must be verified before the commencement of an installation.

When referring to the chemical resistance tables, the classifications Resistant, Conditionally Resistant and Not Recommended are shown using the symbols +, 0 and - respectively. Whilst the terms Resistant and Not Recommended are self explanatory, the term Conditionally Resistant indicates that the medium can attack or cause swelling in the material. The service life is usually shortened and may be restricted by pressure and/or temperature. Note that the data in the tables is based on information from the raw material suppliers, gained using direct contact between the chemical and the un-processed raw material. The resistance of any of the finished products against these media has not been verified. There is no given or intended legally binding assurance of material properties or of suitability for a specific purpose. Materials must be tested under actual service conditions to determine the suitability for a specific application

Chemical resistance of solvent cement welded joints

The chemical resistance of the joints in a solvent welded piping system are the same as the material itself. However, PVC-U or PVC-C solvent welded joints in systems handling the following chemicals can be degraded and require the use of Weld On 724 solvent cement to ensure chemical compatibility:

Hydrochloric Acid 25%+ concentration
Nitric Acid 20%+ concentration
Sulphuric Acid 70%+ concentration
Hydrofluoric Acid in any concentration

Chemical resistance of fusion welded joints

joints Thermoplastic piping systems in polypropylene, polyethylene, ECTFE or PVDF are made with fusion-welded joints using either socket fusion, electro fusion and IR or butt fusion welding techniques. Correctly made fusion joints will have the same chemical resistance as the pipe itself, however in situations where the piping material may be susceptible to stress cracking from the media, the joint itself may be subject to increased risk.

Chemical resistance of valves

Chemical resistance of valves In most cases, valves are manufactured from the same parent material as the pipe-fittings and it can therefore be regarded that their chemical resistance matches that of the piping material. However, valves will usually incorporate elastomeric materials that will be exposed to the media during normal operation. Care should be taken to check the chemical resistance of the elastomeric seals against the chemical to be used in the chemical resistance tables.

Chemical resistance

Media A - CO	Material	PVC-U	PVC-C	ABS	PE	PP	PVDF	EPDM	FPM
	°C	20 40 60	20 40 60 80 95	20 40 60 80	20 40 60	20 60 80 100	20 60 80 100 120	20 40 60 80	20 60 80 100 120
	Concentration								
ACETALDEHTDE	Technically	-	-	-	+ 0 0	0 -	-	+ 0 -	0 -
	40% aqueous solution	0 -	0 0	-	+ + 0	+ + 0 -	- +	+ + + +	+ 0 0
ACETIC ACID	technically pure, glacial	0 -	0 -	-	+ + 0	+ 0 -	+ 0 -	0	-
	10% aqueous	+ + 0	+ + + +	+ 0 -	+ + +	+ + + +	+ + + + +	+ + 0	0 -
ACETIC ACID ANHYDRIDE	technically pure	-	-	-	+ +	+	-	0	-
ACETONE	technically pure	-	-	-	+ + +	+ +	- +	+ + +	-
ACRYLONITRILE	technically pure	-	-	-	+ + +	+	0 +	+ + 0	0 -
ADIPIC ACID	saturated, aqueous	+ + 0	+ + + +	-	+ + +	+ + +	+	+ + +	+ +
ALCOHOLIC SPIRITS	app, 40% ethyl alcohol	+	0	-	+	+	+	+	+
ALLTL ALCOHOL	96%	0 -	0	-	+ + +	+ + + 0	+	0 0 0	0 -
ALUMUNIUM CHLORIDE	saturated	+ + +	+ + + +	+ + + 0	+ + +	+ + +	+ + + + +	+ + + +	+ + + +
ALUMUNIUM SULPHATE	cold saturated, aqueous	+ + +	+ + + +	+ + + 0	+ + +	+ +	+ + + + +	+ + +	+ + +
AMMONIA	gaseous, tech pure	+ + +	-	-	+ + +	+ + + +	-	+	+
AMMONIUM ACETATE	aqueous, all	+ + 0	+ + + +	-	+ + +	+ +	+ + + +	+ + + 0	+ +
AMMONIUM HYDROGEN FLUORIDE	50%, aqueous	+ + 0	+ + + +	-	+ + +	+ +	+ + +	+	+
AMMONIUM AOMPOUNDS: SEE SODIUM									
AMYL ACETATE	c	-	-	-	0 + +	0 -	+ 0	0	-
AMYL ALCOHOL	technically pure	+ + 0	-	-	+ + +	+ + +	+ + + + 0	+ + +	0
ANILINE	technically pure	-	-	-	0	0	+ 0 -	-	0 +
ANILINE HYDROCHLORIDE	aqueous, Saturated	+ 0	-	-	+ + 0	+ 0	+	+ + + +	0 -
ANTIMONY TRICHLORIDE	90% aqueous	+ +		-	+ + +	+ +	+ +	+	+
AQUA REGIA		+ 0	+ + 0	-	0	0 -	0	-	0
ARSENIC ACID	80% aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ + +	+ + + + +	+ + + +	+ + + +
BARIUM HYDROXIDE	aqueous, saturated	+ + 0	+ + + +	+ + + 0	+ + +	+ +	-	+ + + +	+ + +
BARIUM SALTS	aqueous, all	+ + +	+ + + +	+ + + 0	+ + +	+ + +	+ + + +	+ + + +	+ + +
BEEF TALLOW EWULSION, SULPHONATED	usual commercial	+			+	+	+ +	-	+
BEER	usual commercial	+ + +	+ + +	+ + + 0	+ + +	+ +	+ + +	+	+
BENZALDEHYDE	aqueous, saturated	-	-	-	+ + +	+	+	+ + +	+ +
BENZENE	technically pure	-	-	-	0 0 0	0 -	+ 0 -	-	+
BENZENE	free of lead and aromatic compounds	+ + +	0 0 0	-	+ + +	0 -	+ + + + +	-	+ +
BENZONIC ACID	aqueous, all	+ + 0	+ + -	+ + 0 -	+ + +	+ + + +	+ + + + +	-	+ + + 0
BENZYL ALCOHOL	technically pure	0	-	-	+ + +	+ + 0	+ 0 -	+	0
BLEACHING LYE	12.5% active chlorine	+ + 0	+ + + +	0	0 - -	0 -	0 +	+	+
BORAX	aqueous								
BORIC ACID	aqueous, all	+ + 0	+ + + +	0	+ + +	+ + + +	+ + + +	+ + + +	+ +
BRINE, SEA WATER	aqueous, all	+ + 0	+ + + +	+ + + 0	+ + +	+ + + +	+ + + + +	+ + + +	+ + +
BROMINE, LIQUID		+ + 0	+ + + +	+ + +	+ + +	+ + + +	+ + + + +	+ + + +	+ + + +
BULADIENE	technically pure	-	-	-	-	-	+ + + 0	-	+
BUTANE	technically pure	+		-	+ + +	+	+ + + +	-	0
BUTANEDIOL	aqueous, 10%	+		+	+	+ +	+ + +	-	+
BUTANOL	technically pure	+ 0		-	+ + +	+ +	+ + +	+ + +	+ +
BUTYLE ACETATE	technically pure	+ + 0	+	-	+ 0 0	+ 0 0	+ + + 0	+ + +	+ 0
BUTLY PHENOL, P-TERTIARY	technically pure	-	-	-	+	0	+ -	+ -	0 -
BUTYLENE GLYCOL	technically pure	0 -	-	-	0	+	+ + +	-	0
BUTYLENE LIQUID	technically pure	+ + 0	+	+ + + 0	+ + +	+ +	+ + +	+ + +	+ 0
BUTYRIC ACID	technically pure	+		-	-	-	+ + +	0	+
			-	-	+ + 0	+	+ + + 0	0	0
CALCIUM BISULPHATE	cold saturated, aqueous	+	+ + + +				+ + + + +	+	+ + + +
CALCIUM CHLORIDE	saturated, aqueous, all	+ + 0	+ + + +	+ + + 0	+ + +	+ + + +	+ + + + +	+ + + +	+ + + +
CALCIUM HYDROXIDE	aqueous, saturated	+ + +	+ + + +	+ + + 0	+ + +	+ + +	0 0 -	+ + + +	+ + + +
CALCIUM HYPOCHLORITE	cold saturated, aqueous	+ +	+ + + +	+ + -	+ + +	+ +	0 0	+ + +	+ + +
CALCIUM NITRATE	50% aqueous	+ +	+ + + +	+ + + 0	+ + +	+ +	+ + + +	+ + +	+ + +
CARBON DIOXIDE (CARBON ACID)	technically pure moist	+ + 0	+ + + +	+ + + 0	+ + +	+ +	+ + +	+ + + +	+ + +
CARBON DISULPHIDE	technically pure	-	-	-	0	0	+	-	+
CARBON TETRACHLORIDE	technically pure	-	-	-	-	-	+ 0	-	+ +
CAUSIT SODA SOLUTION	up to 40% aqueous	+ + 0	+ - + +	+ + + 0	+ + +	+ + + +	0 0 -	+ + +	0 -
(sodium hydroxide)	up to 50% aqueous	+ + +	+ - + +	+ + + 0	+ + +	+ + + +	0 0 -	+ + 0	-
CHLORAL HYDRATE	technically pure	-	-	-	+ + +	0 -	-	0	0
CHLORIC ACID	10% aqueous	+ + 0	+ + + +	-	+ +	-	+	+ + +	-
CHLORINE	moist, 97% gaseous	0	-	-	-	-	+ + + 0	0	+
	anhydrous, tech pure	0	0	-	0 0 -	-	+ + + 0	0	+
	liquid, technically pure	-	-	-	-	-	+	-	0
CHLORINE WATER	saturated	0 0	+ + + +	0 0	0 0	0	+ + + +	0	0
CHLOROACETIC ACID, MONO	50% aqueous	+ +		-	+ + +	+ +	+ -	0	-
CHLOROENZENE	technically pure	-	-	-	0	+	+ + 0 0	-	-
CHLOROETHANOL	technically pure	-	-	-	+ + +	+ +	+ 0 -	0	-
CHLOROFORM	technically pure	-	-	-	-	0	+ + +	-	0
CHLOROSULPHONIC ACID	technically pure	0		-	-	-	0 -	-	-
CHROME ALUM (CHROMIUM POTASSIUM SULPHATE)	cold saturated, aqueous	+ + +	+ + + +	+ + + 0	+ + +	+ +	+	+ + + +	+ + + +
CHROME ACID	all, aqueous	+	+	-	0	0	+ + 0 0	0	+ 0
CIDER		+	+ + + +	+ +		+	+ +	+	+
CITRIC ACID	10% aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ + + +	+ + + +	+ + +	+ +
COPPER SALT	10% aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ -	+ + + +	+ + + +	+ + +

= No Data - = Not Recommended 0 = Conditionally Resistant + = Resistant

The data in the tables is based on information from the raw material suppliers, gained using direct contact between the chemical and the un-processed raw material. The resistance of any of the finished products against these media has not been verified. There is no given or intended legally binding assurance of material properties or of suitability for a specific purpose. Materials must be tested under actual service conditions to determine the suitability for a specific application.

Chemical resistance

Media CO - MA	Material	PVC-U	PVC-C	ABS	PE	PP	PVDF	EPDM	FPM
	°C	20 40 60	20 40 60 80 95	20 40 60 80	20 40 60	20 60 80 100	20 60 80 100 120	20 40 60 80	20 60 80 100 120
	Concentration								
CORN OIL	technically pure	0	0 0	0	+ + 0	+ 0	+ + +	0 -	+ +
CRESOL	cold saturated, aqueous	0	-	-	+ +	+	+ 0 -	-	+
CROTONIC ALDEHYDE	technically pure	-	-	-	+	+	+ -	+	+
CYCLOHEXANE	technically pure	-	-	-	+ + +	+	+ + +	-	+
CYCLOHEXANOL	technically pure	+ + +	0	-	+ + +	+ 0	+ + 0 -	-	+
CYCLOHEXANONE	technically pure	-	-	-	+ 0 0	+ 0	+ -	0	-
DETERGENTS (WASHING POWDERS)	usual washing lathers	+ + 0	0	-	+ + +	+ + +	+ + + +	+ + +	+ +
DEXTRINE (Starch Gum)	usual commercial	+ + +		+ + + 0	+ + +	+	+ + + + +	+ + +	+ +
DIBUTYL ETHER	technically pure	-	-	-	0 -	0 -	+ + + +	-	+ 0
DIBUTYL PHTHLATE	technically pure	-	-	-	+ 0 0	+ 0	+ -	0	0
DIBUTYL SEBACATE	technically pure	-	-	-	+	+	+ -	+	+
DICHLOROACETIC ACID	technically pure	+ + 0	0 0 0 0	-	+ + 0	+ 0	+ 0 -	+ + +	0 -
DICHLOROACETIC ACID METHTL ESHER	technically pure	-	-	-	+ + +	+ +	0	+ + 0	-
DICHLOROBENZENE	technically pure	-	-	-	0	0	+ + 0	-	+
DICHLOROETHYLENE	technically pure	-	-	-	-	0	+ 0	-	0
DIESEL OIL		+ +	0	0	+ 0	0	+ + + + +	-	+
DIETHYLAMINE	technically pure	0	-	-		+	-	0	
DI-ISOBUTYL KETONE	technically pure	-	-	-	+	+	+ 0	0	-
DIMETHYL FORMAMIDE	technically pure	-	-	-	+ + 0	+ +	-	0	+
DIMETHYLAMINE	technically pure	0	-	-	+ 0	+	0 -	0	-
ETHYL ACETATE	technically pure	-	-		+ 0 0	+ 0	0 -	0 0 0	-
ETHYL ALCOHOL	technically pure, 96%	+ + 0	0	-	+ + +	+ + +	+ 0 0	+ + + +	0 0
ETHYL ALCOHOL + ACETIC ACID	fermentation mixture	+ + 0		-	+ + +	+	+ + 0	+ + 0 +	0 0
ETHYL BENZENE	technically pure	-	-	-		0 -	+	-	0
ETHYL CHLORIDE	technically pure	-	-	-	0	0	+ + + 0	-	0
ETHYL ETHER	technically pure	-	-	-	0	+	+	-	-
ETHYLENE CHLORIDE	technically pure	-	-	-	0	0	+ + + 0 -	0 0 -	+ 0
ETHYLENE DIAMINE	technically pure	0	-	-	+ + +	+	0 -	+ + +	0 -
ETHYLENE GLYCOL	technically pure	+ + +	0 0 0 0	+ + + 0	+ + +	+ + + +	+ + + + +	+ + +	+ + 0 0
ETHYLENE OXIDE	technically pure, liquid	-	-	-	-	0	+ + 0	0	-
FATTY ACIDS .C6	technically pure	+ + +	0 0 0	-			+ + +	-	+
FATTY ALCOHOL SULPHONATES	aqueous	+ + 0		-	+ + 0 + + +	+ +	+ + + +	+ + +	+
FERRIC CHLORIDE	saturated	+ + +		-		+ 0	+ + + + 0	+ + + 0	+ + + + +
FERRIC NITRATE	saturated	+ + +		+ 0 -	+ + +	+ + 0	+ + + + 0	+ + 0 -	+ + + + +
FERROUS SULPHATE		+ + +		+ + + 0	+ + 0	0 -	+ + + + 0	+ + + +	+ + + + +
FLUOSILICIC ACID	32%, aqueous	+ + +	+ + + 0	+ + + 0	+ + +	+ + + +	+ + + +	0 0 -	-
FORMALDEHYDE	40%, aqueous	+ +	0	+ + + 0	+ + +	+	+ + +	+ + +	+
FORMAMIDE	technically pure	-	-	-	+ + +	+		+	0
FORMIC ACID	technically pure	+ 0 -	0 -	-	+ + +	+ +	+ + + + +	+ + + 0	-
FRUIT JUICES		+ + +	+ + + +	+ + + 0	+ + +	+ -	+ + + + +	+ + + +	+ + + + +
FUEL OIL		+ +	0	0	0 - -	+ + + +	+ + + + +	-	+ +
FURFURYL ALCOHOL	technically pure	-	-	-	+ + +	0 -	+ 0 -	0	-
GELATINE	all, aqueous	+ +	+ + + +	+ + + 0	+ + +	+ 0	+ + +	+ + + +	+ + + +
GLUCOSE	all, aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ +	+ + + + +	+ + + 0	+ 0 -
GLYCERINE	technically pure	+ + +	+ + + +	+ + 0	+ + +	+ + +	+ + + + +	+ +	+
GLYCOCOLL	10%, aqueous	+ +		+	+ + +	+ + +	+ + +	+ +	+
GLYCOLIC ACID	37%, aqueous	+		+ +	+ + +	+	+ + + +	+	+
HEPTANE	technically pure	+	+	+ -	+ 0	+ 0	+ + + +	-	+ +
HEXANE	technically pure	+	+	+ -	+ 0	+ 0	+ + + +	-	+ +
HYDRAZINE HYDRATE	aqueous	+		-	+ + +	+ +	+ 0	+	+
HYDROBROMIC ACID	50%, aqueous	+ + +	+ + + +	+ +	+ + +	+ +	+ + + +	+ + 0 -	+ +
HYDROCHLORIC ACID	up to 10%, aqueous	+ + 0	+ + + +	+ + 0 -	+ + +	+ 0 0	+ + + + +	+ + + +	+ + 0
	up to 36%, aqueous	+ + 0	+ + + +	-	+ + +	+ -	+ + + +	+ 0 -	+ - +
HYDROCYANIC ACID	technically pure	+ + 0		+ +	+ + +	+ +	+ + +	+ 0	+
HYDROFLUORIC ACID	up to 10%, aqueous	+ 0 0	+ +	+ +	+ + 0	+ +	+ + + +	-	+ 0
	40%, aqueous	+	0 0	-	+ + 0	+ +	+ + + +	-	+
	70%, aqueous	+		-	+ 0	+	+ + + +	-	+
HYDROGEN	technically pure	+ + +		+ + + 0	+ + +	+ +	+ + + +	+ + + +	+ + + +
HYDROGEN CHLORIDE	tech. pure, gaseous	+ + 0	+	-	+ + +	+ +	+ + + + +	+ + +	+ +
HYDROGEN PEROXIDE	3%, aqueous	+ + 0	+	+ +	+ + +	+ +	+ + + +	+ 0 -	+ -
	30%, aqueous	+ +	+	-	+ + +	+ 0	+ + + +	0 -	+ 0 -
	90%, aqueous	+		-	+ -	-	+	0	0
HYDROGEN SULPHIDE	technically pure	+ + +		+	+ + 0	+ +	+ + + + +	+ 0 -	+ 0 -
IODINE SOLUTION	6.5% iodine in ethanol	-	0	-	+ 0	+	+ +	+	+
IRON SALTS	all, aqueous	+ + 0	+ + + +	+ +	+ + +	+ + +	+ + + + +	+ + + +	+ + + +
ISO-OCTANE	technically pure	+		-	+ 0	+ 0	+ + + +	-	+
ISOPROPYL ALCOHOL	technically pure	+	0	-	+ + +	+ + + +	+ + 0	+ + + 0	+ + 0
ISOPROPYL ETHER	technically pure	-	-	-	0 -	0 -	+ +	-	-
LACTIC ACID	10%, aqueous	+ 0 -	+ + 0	+ 0 -	+ + +	+ + + +	+ 0 0 -	0 0 0 -	+ 0 0
LANOLIN	technically pure	+ 0	0 0 0	+ + + 0	+ + +	+ +	+ + + + +	0 -	+ +
LEAD ACETATE	aqueous, saturated	+ + +	+ + + +	+ + + 0	+ + +	+	+ + + +	+ + +	+ +
LINSEED OIL	technically pure	+ + 0	0 0 0	+	+ + +	+ + + +	+ + + + +	0 -	+ +
LUBRICATING OILS		+ + +		0	+ + 0	0	+ + + + +	-	+ + + -
MAGNESIUM SALTS	all, aqueous	+ + 0	+ + + +	+ +	+ + +	+ + + +	+ + + + +	+ + + +	+ + + +
MALEIC ACID	cold saturated, aqueous	+ + 0	+ + + +	+	+ + +	+ +	+ + + + +	0 -	+ + -

= No Data - = Not Recommended 0 = Conditionally Resistant + = Resistant

Chemical resistance

Media ME - SO	Material °C Concentration	PVC-U 20 40 60	PVC-C 20 40 60 80 95	ABS 20 40 60 80	PE 20 40 60	PP 20 60 80 100	PVDF 20 60 80 100 120	EPDM 20 40 60 80	FPM 20 60 80 100 120
MERCURY	pure	+ + +	+ + 0	+	+ + +	+ +	+ + + + +	+ + +	+ + +
MERCURY SALTS	cold, saturated, aqueous	+ + 0	+ + + +	+	+ + +	+ +	+ + + + +	+ + +	+ +
METHANE (natural gas)	technically pure	+		+	+	+	+ +	-	+
METHANOL	all	+ + +	-	-	+ + +	+ +	+ + + +	+ + +	0 0
METHYL ACETATE	technically pure	-	-	-	+	+ 0	+	0	-
METHYL AMINE	32%, aqueous	0	-	-	+	+	0	+	+
METHYL BROMIDE	technically pure	-	-	-	0	-	+ +	-	0
METHYL CHLORIDE	technically pure	-	-	-	0	-	+ +	0	-
METHYLENE CHLORIDE	technically pure	-	-	-	0	0	+ 0	-	0
METHYL ETHYL KETONE	technically pure	-	-	-	+ 0 -	+ 0	- -	+ 0	-
MILK		+ + +	-	+ + + 0	+ + +	+ + + +	+ + + + +	+	+
MOLASSES		+ + 0	+ + + +	+ + 0	+ + +	+ +	+ + +	+ + + +	+ + +
MONOCHLOROACETIC ACID ETHYL ESTER	technically pure	0	-	-	+ + +	+ +	+	+	0
MONOCHLOROACETIC ACID METHYL ESTER	technically pure	0	-	-	+ + +	+ +	+	+	0
MORPHOLIN	technically pure	-	-	-	+ + +	+ +	+ 0	0	+
NAPHTHALENE	technically pure	-	-	-	+ 0	+	0 0	-	+ +
NICKEL SALTS	cold saturated, aqueous	+ + 0	+ + + +	+ + + -	+ + +	+ +	+ + + + +	+ + + +	+ + + + +
NITRIC ACID	5%, aqueous up to	+ + +	+ + + +	+ 0 -	+ + +	+ 0	+ + + +	+ + 0	+ 0 -
	40%, aqueous	+ + 0	+ + + 0	-	0 -	0 -	+ + + +	+ + 0	+ + 0
	65%, aqueous	0 0 -	+ + 0 0	-	0 - -	-	+ + 0 0	-	+ -
NITROBENZENE	technically pure	-	-	-	+ + 0	+ +	+ + - -	-	0
NITROLUENE (o-, m-, p-)	technically pure	-	-	-	+ + 0	+ 0	+ + + 0	-	0 -
NITROUS GASES	diluted, moist, anhydrous	+ 0		0	+ + +	+ -	+ + + +	+ + 0	+ +
OLEIC ACID	technically pure	+ + +	0	+ 0 -	+ + 0	+ 0	+ + + +	-	+ -
OLIVE OIL		+ + +	0 0 0	+	+ + 0	+ + +	+ + + + +	-	+ + +
OXALIC ACID	cold saturated, aqueous	+ + +	+ + + +	+ +	+ + +	+ +	+ 0	0 0 0 -	+ 0 -
OXYGEN	technically pure	+ + +		+ + + -	+ + 0	+ 0	+ + + 0 0	+ + + +	+ + + + +
OZONE	cold saturated, aqueous	+ +		-	0 -	0 -	+ + 0	+ 0 -	+ -
PALMITIC ACID	technically pure	+	0	-	0	-	+ + + + +	0 -	+ -
PALM OIL, PALM NUT OIL		+ -	0		+ + 0	+ 0	+ + + +	+ 0 -	+ +
PARAFFIN EMULSIONS	usual comm., aqueous	+ +		-	+ + 0	+ 0	+ + + +	-	+ + +
PARAFFIN OIL		+ + 0		+ + + 0	+ + +	+ 0	+ + + + +	-	+ + 0
PERCHLORIC ACID	10%, aqueous	+ + 0	+	+ +	+ + +	+ +	+ + + +	+ + + 0	+ + 0
	70%, aqueous	0		-	+ 0 -	0 -	+ + + +	+ + + 0	+ + 0
PERCHLOROETHYLENE (tetrachloroethylene)	technically pure	-	-	-	0	0	+ + 0 0	-	+ +
PETROLEUM	technically pure	+	0 0 0	-	+ + 0	+ 0	+ + + + +	-	+ 0
PETROLEUM ETHER	technically pure	+ + +	+ + +	-	+ 0 0	+ 0	+ + + +	-	+ 0
PETROLEUM JELLY	technically pure	0 -		-	0 -	+ 0	+ + + + +	-	+ + + + +
PHENOL	up to 90%, aqueous	0	+ + +	-	+ + 0	+ +	+ + + +	-	+ -
PHENYLHYDRAZINE	technically pure	-	-	-	0	0	+	0	+ 0
PHENYLHYDRAZINE HYDROCHLORIDE	aqueous gaseous,	0		-	0	+ 0	+ +	+ + 0	+ 0 -
PHOSGENE	technically pure	+ 0 0	-	-		0	+	+ + +	+ 0
PHOSPHORIC ACID	85%, aqueous	+ + +	+ + + +	+ + 0 -	+ + 0	+ + + +	+ + + + +	+ + + 0	+ + + 0
PHOSPHOROUS PENTOXIDE	technically pure	+ +		+ +	+ +	+	+ + + +	+ + +	+ +
PHOTOGRAPHIC DEVELOPER	usual commercial	+ + 0	+	+ + 0	+ + 0	+	+ +	+ +	+
PHOTOGRAPHIC EMULSION		+ +		+ +	+ +	+	+ +	+ +	+
PHOTOGRAPHIC FIXER P	usual commercial	+ + 0		+ + 0	+ +	+	+ +	+ +	+
HTHALIC ACID	saturated, aqueous	+ 0 -		-	+ + +	+ +	+ + + +	+ + 0	-
PICRIC ACID	1%, aqueous	+		-	+	+	+ + + +	+ + 0	+ + 0
POTASH (potassium carbonate)	cold saturated, aqueous	+ +	+ + + +	+ + + 0	+ +	+ +	+ 0	+ +	+
POTASSIUM PERMANGANATE	cold saturated, aqueous	+ + 0	+ + + +	-	+ + 0	+ +	+ + + +	+ + +	
POTASSIUM COMPOUNDS: see SODIUM									+ + +
PROPANE	technically pure, liquid	+		+	+	+	+ +	-	+
PROPANOL, n- and iso-	technically pure	+ 0 0	0 0 0	+	+ + +	+ +	+ + 0	+ + +	+ +
PROPIONIC ACID	50%, aqueous	+ + 0	0 0 0	+	+ + +	+ +	+ +	+ + +	+ 0
PROPYLENE GLYCOL	technically pure	+ + +	0	0	+ + +	+ +	+ +	+ + +	+ 0
PROPYLENE OXIDE	technically pure	0	-	-	+	+	+	+	-
PYRIDINE	technically pure	-	-	-	+ 0 0	0 0	+ 0 0 -	+ 0 -	0 -
SILICONE OIL		+ 0 -	+ 0 0	+	+ + +	+ + + +		0 -	+ +
SILVER SALTS	cold saturated,aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ +	+ + + +	+ + +	+ +
SOAP SOLUTION	all, aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ +	+ + + +	+ + +	+ +
SODIUM ACETATE	all, aqueous	+	+	+ + + 0	+ + +	+ + + +	+ + + 0	+ + + 0	+ + 0
SODIUM BENZOATE	cold saturated, aqueous	+ + 0	+ + + +	+	+ + +	+ +	+ + + 0	+ + + 0	+ + 0
SODIUM BICARBONATE	cold saturated, aqueous	+ + +	+ + + +	+ + + 0	+ + +	+ + +	+ + 0	+ + + +	+ + +
SODIUM BISULPHATE	10%, aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ +	+ + + + +	+ + + 0	+ + + +
SODIUM BISULPHITE	all, aqueous	+ 0 -	+ + + +		+ + +	+ +	+ + + +	+ + + 0	0 -
SODIUM BROMATE	all, aqueous	+ 0	+ + + +		+ 0	+	+ + + +	+ + +	+ +
SODIUM BROMIDE	all, aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ +	+ + + + +	+ + +	+ + +
SODIUM CARBONATE (soda)	cold saturated, aqueous	+ + +	+ + + +	+ + + 0	+ + +	+ + + +	+ 0	+ + + +	+ +
SODIUM CHLORATE	all, aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ +	+ + + + +	+ + + 0	+ + +
SODIUM CHLORIDE	all, aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ + +	+ + + + +	+ + + +	+ + + +

= No Data - = Not Recommended 0 = Conditionally Resistant + = Resistant

Chemical resistance

Media SO - Z	Material °C Concentration	PVC-U 20 40 60	PVC-C 20 40 60 80 95	ABS 20 40 60 80	PE 20 40 60	PP 20 60 80 100	PVDF 20 60 80 100 120	EPDM 20 40 60 80	FPM 20 60 80 100 120
SODIUM CHLORITE	diluted, aqueous	0	+ + + +		+	+ 0	+ + + 0	+ + +	+ +
SODIUM CHROMATE	10%, aqueous	+ + 0	+ + + +	+ + + 0	+	+	+ + + +	+ + +	+ +
SODIUM DISULPHATE	all, aqueous	+ + 0	+ + + +		+	+	+ + + +	+ + +	+ +
SODIUM DITHIONITE								+ + +	
(hyposulphite)	up to 10%, aqueous	+ + 0	+ + + +		+ + +	+ +	+ 0		+ +
SODIUM FLUORIDE	cold saturated, aqueous	+ +	+ + + +	+ + + 0	+	+	+ + + +	+ + +	+ +
SODIUM HYDROXIDE									
see CAUSTIC SODA									
SODIUM HYPOCHLORITE	aqueous (12.5% active)	+ + 0	+ + + +	-	0 -			+	+
SODIUM IODIDE	all, aqueous	+ + 0	+ + + +	+ + + 0	+	0 -	0 -	+ + +	+ +
SODIUM NITRATE	cold saturated, aqueous	+ + 0	+ + + +	+ +	+ + +	+	+ 0 + + +	+ + +	+ +
SODIUM NITRITE	cold saturated, aqueous	+	+ + + +	+ + + 0	+	+ +	+ + + + +	+ + +	+ +
SODIUM OXALATE	cold saturated, aqueous	+ + 0	+ + + +		+	+	+ +	+	+
SODIUM PERSULPHATE	cold saturated, aqueous	+ + 0	+		+ + +	+	+ 0	+ + +	+ + + +
SODIUM PHOSPHATE	cold saturated, aqueous	+ + 0	+ + + +	+ -	+ + +	+ +	+ + 0 -	+ + +	+ +
SODIUM SILICATE	all, aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ + +	+ + -	+ + +	+ +
SODIUM SULPHATE	cold saturated, aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ +	+ 0 + + +	+ + 0 +	+ + +
SODIUM SULPHIDE	cold saturated, aqueous	+ + 0	+ + + +	+ + + 0	+ + +	+ + +	+ +	+ + +	+
SODIUM SULPHITE	cold saturated, aqueous	+ + 0	+ + + +	+ +	+ + +	+ +	+ 0 + +	+ + +	+ +
SODIUM THIOSULPHATE	cold saturated, aqueous	+ + 0	+ + + +	+ -	+ + +	+ +	+ + + +	+ + +	+ +
SPIRITS (brandy)	usual commercial	+ + +		-	+ + +	+ +	+ + + +	+ + + +	+ + 0
STANNOUS CHLORIDE	cold saturated, aqueous	+ 0 0	+ + + +	+ +	+ + +	+ +	+ + + +	+ 0 -	+ +
STARCH SOLUTION	all, aqueous	+ + +	+ + + +	+ +	+ + +	+ +	+ + + +	+ + +	+ +
STEARIC ACID	technically pure	+ + +	0	+ +	+ 0	+ 0	+ + + + +	+ + 0	+ 0
SUCCINIC ACID	all, aqueous	+ + +	+ + +		+ + +	+ +	+ +	+ + +	+ + +
SUGAR SYRUP	usual commercial	+ + 0	+ + +	+ + + 0	+ + +	+ + + +	+ + + + +	+ + + +	+ + +
SULPHUR	technically pure	0 -		-	+ + +	+ + +	+ + + + +	-	+ + +
SULPHUR DIOXIDE	all, moist	+ + 0		-	+ + +	+ +	+ -	+ + 0 -	+ -
	technically pure, liquid	-		-	-	-	-	0	0
SULPHUR TRIOXIDE		-		-	-	-	0	-	+
SULPHURIC ACID	up to 30%, aqueous	+ + 0	+ + + +	+ + 0 0	+ + +	+ +	+ + + + +	+ + + 0	+ + 0 -
	up to 50%, aqueous	+ + +	+ + + +	+ 0 -	+ + +	+ +	+ + + + +	+ + 0 -	+ + 0
	up to 80%, aqueous	+ + +	+ + + +	-	+ + 0	+ 0	+ + + 0 0	+ 0 -	+ 0 -
	up to 90%, aqueous	+ +	+ + + -	-	0	0	+ + + 0 -	0 -	+
	up to 96%, aqueous	+ + 0	+ + -	-	-	-	+ + 0 -	-	+
SULPHUROUS ACID	saturated, aqueous	+ + 0	+ + + +	-	+ + +	+ +	+ + + +	+ 0 -	+ 0 -
TALLOW	technically pure	+ + +	0 0 0	+ +	+ + +	+ +	+ + + +	+ + +	+ +
TANNIC ACID	all, aqueous	+	+ + + +	+ +	+ + +	+ +		+	+
TARTARIC ACID	all, aqueous	+ + 0	+ + + +	+ +	+ + +	+ +	+ + + + +	+ 0	+ +
TETRACHLOROETHANE	technically pure	-	-	-	0	0	+ 0	-	0
TETRAETHYL LEAD	technically pure	+		-	+	+	+ + + + +	0	+
TETRAHYDROFURANE	technically pure	-	-	-	0	-	0 0	-	-
THIONYL CHLORIDE	technically pure	-	-	-	-	-	+	-	-
TOLUENE	technically pure	-	-	-	0	0 -	+ + 0 -	-	0 -
TRIBUTYLPHOSPHATE	technically pure	-	-	-	+ + +	+ +	+	+	-
TRICHLOROETHYLENE	technically pure	-	-	-	-	0	+ + +	-	+
TRICHLOROACETIC ACID	50%, aqueous	+ 0		-	+ + +	+ +	+ 0 -	0	-
TRICHLOROETHANE				-					
(met hylchlorof orm)	technically pure	-	-	-	0	0	+ 0 -	-	+
1,1,2-TRICHLOR0-				-					
1,2,2-TRIFLUOROETHANE				-					
(Freon 113)	technically pure	+ +	-	-			+	-	+
TRICESYL PHOSPHATE	technically pure	-	-	-	+ + +	+ 0		-	-
TRIETHANOLAMINE	technically pure	0	-	+	+ + +	+	+	-	+
TRIETHYLAMINE	technically pure		-	-			0 -	-	
TRIO CTYL PHOSPHATE	technically pure	-	-	-	0	+		-	-
TURPENTINE OIL	technically pure	+ 0	0 0 0	-	0 0 0	-	+	-	+ +
UREA		+ + 0	+ + + +	+ +	+ + +	+ +	+ + + 0	+ + +	+ +
URINE		+ + 0	+ + + +	+ +	+ + +	+ +	+ + + +	+ + +	+ +
VEGETABLE OILS AND FATS		+ 0	0	+ + + 0	+ 0	+ 0	+ + + +	-	+ +
VINEGAR		+ + +	+ + + +	+ + 0 -	+ + +	+ + +	+ + + +	+ 0 -	0 -
VINYL ACETATE		-	-	-		+ 0		+	+
VINYL CHLORIDE		-	-	-			+ + +	0	+
WASTE GASES, alkaline		+ + +	+ + + +		+ + +	+ + +	+ - -	+ + + +	+ + 0 -
WASTE GASES containing:									
- CARBON OXIDES	all	+ + +	+ + + +		+ + +	+ + +	+ + + + +	+ + + +	+ + + +
- HYDROCHLORIC ACID	all	+ + +	+ + + +		+ + +	+ + 0	+ + + + +	+ + + 0	+ + + +
- HYDROGEN FLUORIDE	traces	+ + +			+ + +	+ +	+ + + +	+ + 0	+ + +
- NITROUS GASES	traces	+ + +	+ + + +		+ + +	+ 0	+ + + +	+ + + 0	+ + + 0
- SULPHUR DIOXIDE	traces	+ + +	+ + + +		+ + +	+ + +	+ + + +	+ + + +	+ + +
- SULPHUR TRIOXIDE	traces	+ + +	+ + + +		+ + +	+ 0 0	+ + + +	+ + + 0	+ + +
- SULPHURIC ACID	all	+ + +	+ + + +		+ + +	+ 0	+ + + +	+ + + 0	+ + +
WATER, condensed		+ + 0	+ + + +	+ + + -	+ + +	+ +	+ + + +	+ + 0	+ + + + +
WATER, distilled, de-ionised		+ + +	+ + + +	+ + + -	+ + +	+ + + +	+ + + + +	+ + 0 -	+ + + +
WATER, drinking		+ + +	+ + + +	+ + + -	+ + +	+ + + +	+ + + + +	+ + 0	+ +
WAX ALCOHOL	technically pure	+ + +		-	0 -	0 -	+ + + +	-	+
WETTING AGENTS	up to 5%, aqueous	+ + 0	0	+	+	+ +	+ + +	+	+
WINES, red and white	usual commercial	+ +	+ + + +	+ + + 0	+ + +	+ +	+ + + +	+	+
WINE VINEGAR	usual commercial	+ + +	+ + + +	+ +	+ + +	+ + +	+ + + +	+ 0	0 -
YEAST	all, aqueous	+ +	+ +	+	+ + +	+ +	+ + +	+ +	+ +
XYLENE	technically pure	-	-	- -	-	-	+ 0 0 -	-	+ +
ZINC SALTS	all, aqueous	+ + 0	+ + + +	+ +	+ + +	+ +	+ + + + +	+ + +	+ +

= No Data - = Not Recommended 0 = Conditionally Resistant + = Resistant