

RESISTANCE TO CHEMICALS

HDPE as a material is resistant to a wide range of chemicals. Following are results obtained on specimens 50x25x1mm with a test period of 55 days. The resistance to chemicals given here cannot generally be applied to a behaviour of a pipe filled with the corresponding substance, when it is under pressure. In some cases creep rupture test tests with test pipes are necessary.

KEY :					
x = Resistant	swelling < 3% or loss in weight < 0.5% and / or elongation at break not substantially changed.				
/ = Limited Resistant	swelling 3 - 8% or loss in weight 0.5 - 5% and / or elongation at break reduced by < 50%				
- = Not Resistant	swelling < 5% and / or < 8% or loss in weight, elongation at break decreased by < 50%				
D = Discolouration					
ND = No Data					
MEDIUM	20 ° C	60 ° C	MEDIUM	20 ° C	60 ° C
Acetaldehyde gaseous	x	l	Calcium Chloride *	x	x
Acetic Acid (10%)	x	x	Calcium Hypochlorite *	x	x
Acetic Acid (100%)			Camphor	x	/
(glacial acetic acid)	x	/D	Carbon dioxide	x	x
Acetic anhydride	x	/D	Carbon disulphide	/	ND
Acetone	x	x	Cyclohexanol	x	x
Acetylene tetrabromide **	/ to -	-	Cyclohexanone	x	x
Acids, aromatic	x	x	Cyclohexane	x	x
Acrylonitrile	x	x	Caustic Potash	x	x
Adipic Acid	x	x	Carbon Tetrachloride	** / to -	-
Allyl Alcohol	x	x	Caustic soda	x	x
Aluminium Chloride			Chlorine , liquid	-	-
(anhydrous)	x	x	Chlorine gas, dry	/	-
Aluminium Sulphate	x	x	Chlorine gas, moist	/	-
Alums	x	x	Chloroacetic Acid (mono)		
Ammonia (gaseous) 100%	x	x	Chloroform	x	x
Ammonium Chloride	x	x	Chronic Acid (80%)	-	-
Ammonium Fluoride			Citric Acid	x	- D
(aqueous upto 20%)	x	x	Coconut Oil	x	x
Ammonium Nitrate *	x	x	Copper Salts	* x	/
Ammonium Sulphate *	x	x	Corn germ oil	x	/
Ammonium Sulphide *	x	x	Creosote	x	x D
Amyl Acetate	x	x	Cresol	x	x D
Aniline, pure	x	x	Decalin	x	/
Anisole	/	-	Desicator Grease	x	/
Antimony Trichloride	x	x	Detergent Synthetic	x	x
Aqua Regia	-	-	Dextrine, aqueous	/	-
Benzyl Alcohol	x	x to /	(18% saturated)	x	x
Borax, any conc.	x	x	Dichloroacetic Acid (100%)	x	/ D
Bromine	-	-	Dichloroacetic Acid (50%)	x	x
Bromine Vapours	/	N.D	Dibutyl Ether	x to /	-
Butanetriol	x	x	Dichloroacetic methyl ester	x	x
Butanol	x	x	Dichlorobenze	/	-
Butoxyl	x	/	Dichloroethylene	-	-
Brine saturated	x	x	Diesel Oil	x	/
Butyl acetate	x	/	Di-isobutyl Keton	x to /	-
Butyl glycol	x	x	Dimethyl Formamide (100%)	x	x to /
Butyric Acid	x	/	Dibutyl phthalste	x	/
Barium Chloride *	x	x	Diethyl Ether	x to /	/
Barium Hydroxide *	x	x	Dioxane	x	x
Beer	x	x	Emulsifiers	x	x
Beeswax	x	**/ to -	Ester aliphatic	x	x to /
Benzene	/	/	Ethanol Chloride	x	x D
Benzene Sulphonic Acid	x	x	Ether	x to /	/
Benzoic acid *	x	x	Ethyl Acetate	/	-

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RESISTANCE TO CHEMICALS (contd.)

MEDIUM	20 ° C	60 ° C	MEDIUM	20 ° C	60 ° C
Ethyl Glycol	x	x	Monochloroacetic ethyl		
Ethyl Hexanol	x	x	ester	x	x
Euron G	x	x	Morpholine	x	x
Ethyl Alcohol	x	x	Naptha	x	/
Ethylene Chloride			Napthalene	x	/
(dichloroethane)	/	/	Nickel Salts	x	x
Ethylene diamine	x	x	Nitric Acid (25%)	x	x
Fatty Acid (7C ₆)	x	/	Nitric Acid (50%)	/	-
Ferric Chloride	x	x	Nitrobenzene	x	/
Fluorine	-	-	o-Nitrotoluene	x	/
Fluosilicic Acid, aqueous			Nitrous gases	x	x
(upto 32%)	x	x	Octyl cresal	/	-
Formaldehyde (40%)	x	x	Oils, ethereal	/	/
Formamide	x	x	Oils, vegetable & animal	x	x to /
Formic Acid	x	ND	Oleic Acid (conc.)	x	/
Frigen	/	-	Oxalic acid (50%)	x	x
Fruit Juices	x	x	Ozone	/	-
Fruit Plup	x	x	Paraffin Oil	x	x
Fuming Sulphuric Acid	-	-	Perchloric Acid (20%)	x	x
Furfuryl Alcohol	x	x D	Perchloric Acid (50%)	x	/
Gelatine	x	x	Perchloric Acid (70%)	x	- D
Glucose	x	x	Petrol	x	x to /
Glycerine Chlorohydrin	x	x	Petroleum	x	/
Glycerol	x	x	Petroleum ether	x	/
Glycol (conc.)	x	x	Phenol	x	x D
Glycolic Acid (50%)	x	x	Phosphates	x	x
Glycolic Acid (70%)	x	x	Phosphoric Acid (25%)	x	x
Hydrogen Chloride gas & dry	x	x	Phosphoric Acid (50%)	x	x
Hydrogen	x	x	Phosphoric Acid (95%)	x	/ D
Hydrogen Peroxide 30%	x	x	Phosphorous oxychloride	x	/ D
Hydrogen Peroxide 100%	x	-	Phosphorous pentoxide	x	x
Hydrogen Sulphide	x	x	Phosphorous trichloride	x	/
Halothan	/	/	Photographic developers,		
Hydrazlne hydrate	x	x	Commercial	x	x
Hydrobormic Acid (50%)	x	x	Phthalic acid (50%)	x	x
Hydrochloric Acid (all conc.)	x	x	Polyglycols	x	x
Hydrofluoric Acid (40%)	x	/	Potassium bichormate (40%)	x	x
Hydrofluoric Acid (70%)	x	/	Potassium Borate,		
Iodine, Tincture of DAB 6	x	/ D	aqueous (1%)	x	x
Isooctane	x	/	Potassium Bromate,		
Isopropanol	x	x	aqueous (upto 10%)	x	x
Isopropyl Ether	x to /	-	Potassium Bromide *	x	x
Jam	x	x	Potassium Chloride *	x	x
Ketones	x	x to /	Potassium chromate,		
Lactic Acid	x	x	aqueous (40%)	x	ND
Lead Acetate	x	x	Potassium cynide *	x	x
Linseed Oil	x	x	Potassium hydroxide		
Magnesium Chloride	x	x	(30% solution)	x	x
Magnesium Sulphate	x	x	Potassium nitrate *	x	x
Maleic Acid	x	x	Potassium permanganate *	x	x
Menthol	x	/	Propanol	x	x
Mercuric Chloride (sublimate)	x	x	Propionic Acid (50%)	x	x
Mercury	x	x	Propionic Acid (100%)	x	/
Menthanol	x	x	Propylene glycol	x	x
Methylene Chloride	/	/	Prussic Acid	x	x
Methyl Ethyl Ketone	x	/ to -	Pseudocumene	/	/
Methyl Glycol	x	x	Pyridine	x	/
Mineral Oils	x	x to /	Sea Water	x	x
Molasses	x	x	Silicic Acid	x	x
Monochloroacetic Acid	x	x	Silicone oil	x	x

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RESISTANCE TO CHEMICALS (contd.)

MEDIUM	20 ° C	60 ° C	MEDIUM	20 ° C	60 ° C
Sulphuric acid (10%)	x	x	Tributyl phosphate	x	x
Sulphuric acid (50%)	x	x	Trichloroacetic Acid (50%)	x	x
Sulphuric acid (98%)	x	-D	Trichloroacetic Acid (100%)	x	/ to -
Sulphours acid	x	x	Trichloethylene **	/ to -	-
Sulphuryl chloride	-	D	Triethanolamine	x	x
Silicic acid	x	x	Turpentine, oil of	x to /	/
Silicone oil	x	x	Tugogen "U"	x	x
Silver nitrate	x	x	Tween 20 and 80	x	x
Sodium benzoate	x	x	Urea **	x	x
Sodium bisulphate, diluted			Vaseline **	x to /	/
with water	x	x	Vinegar, commercial		
Sodium Carbonate *	x	x	conc.	x	x
Sodium chloride *	x	x	Viscose spinning sol.	x	x
Sodium chlorite (50%)	x	x	Waste gases, containing		
Sodium chlorite bleach	x	/	carbon dioxide	x	x
Sodium hydroxide(30% sol.) *	x	x	Waste gases, containing		
Sodium hypochlorite *	x	x	carbon monoxide	x	x
Sodium nitrate *	x	x	Waste gases, containing		
Sodium silicate *	x	x	hydrochloric acid (any conc.)	x	x
Sodium sulphide *	x	x	Waste gases, containing		
Sodium thiosulphate	x	x	hydrogen fluoride (traces)	x	x
Spindle oil	x to /	/	Waste gases, containing		
Starch	x	x	nitrous gases (traces)	x	x
Stearic acid	x	/	Waste gases, containing		
Sugar syrup	x	x	sulphur dioxide(low conc.)	x	x
Sulphur	x	x	Waste gases, containing		
Sulphur dioxide, moist	x	x	sulphuric acid, moist		
Tallow	x	x	(any conc.)	x	x
Tannic acid (10%)	x	x	Water glass	x	x
Tartaric acid	x	x	p-Xylene	/	-
Tetrachlorethane **	x to /	-	Yeast, aqueous	x	x
Tetrahydrofurane **	x to /	-	Zinc chloride *	x	x
Tetralin	x	/	Spermacetic	x	/
Thionyl chloride	-	-	Succinic acid (50%)	x	x
Thiophene	/	/	Sulphates	x	x
Toluene	/	-	Sulphur dioxide, dry	x	x
Transformer oil	x	/	Sulphur trioxide	-	x

* aqueous sololutions in any concentration

** only at low mechanical stress.