

TECHNICAL NOTE

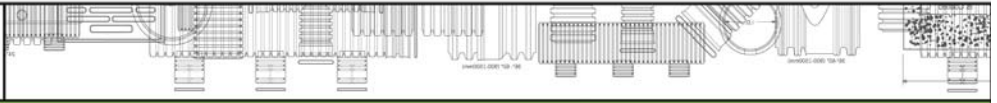
Chemical Resistance of Polyethylene and Elastomers

TN 4.01
February 2007

The results reported herein are of testing performed on HDPE material, compiled from multiple sources. A listing of sources is available at the conclusion of this document. Actual results may vary on the environmental conditions for each particular application. In evaluating the capability of polyethylene pipe, fittings, and manholes to withstand chemical attack, consideration should be given to the following:

1. The effect of an active substance on polyethylene is not as severe when contact is intermittent.
2. Increasing temperature increases chemical activity.
3. Internal pressure may affect the rate of penetration of a substance.
4. Excessive bending and other stresses resulting from improper installation may affect the life of polyethylene products. An example would be circumferential deflection beyond 50% or placing pipe directly on a large, sharp rock.

This listing contains accurate and reliable information to the best of our knowledge. The data contained herein is a compilation of studies conducted by various sources which Advanced Drainage Systems believes to be reliable. However, the information cannot be guaranteed because the conditions of use are beyond our control. The user of this information assumes all risk associated with its use.

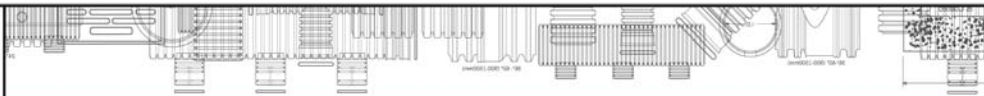


POLYETHYLENE

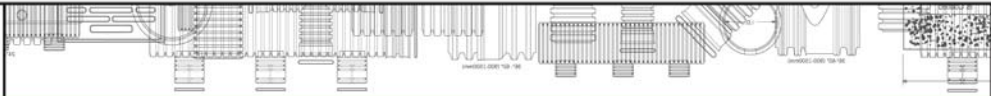
Test Procedure

Polyethylene specimens were placed in the relevant substance for a period of time without the application of mechanical stress. They were then tested for swelling or weight loss and subjected to tensile testing. In critical applications, it is suggested that greater reliance be placed on actual field experience or testing should be performed under similar conditions of stress, exposure, temperature and duration which can be related to the anticipated application.

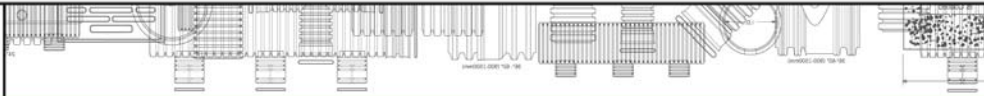
Symbols used in the following table:	
Symbol	Description
+	specimen is resistant swelling < 3% or alternatively weight loss < .0.5%, elongation of break not significantly changed
/	specimen has limited swelling 3 - 8% or alternatively weight resistance only loss 0.5 - 5%, and/or elongation at break decreased by < 50%
-	specimen is not resistant swelling > 8% or alternatively weight loss > 5%, and/or elongation a break decreased by > 50%
D	discoloration
*	or at the boil



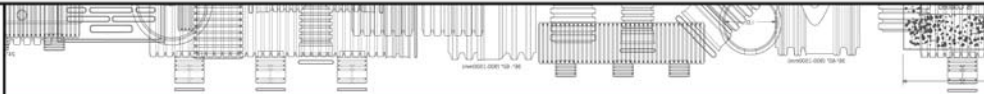
Substance	POLYETHYLENE			Substance	POLYETHYLENE		
	Concentration	68°F	140°F		Concentration	68°F	140°F
Acetaldehyde + acetic acid	90:10:00	+		Ammonium carbonate	all	+	+
Acetaldehyde, aqueous	all	+	/	Ammonium chloride, aqueous	all	+	+
Acetamide		+	+	Ammonium hydrosulphide, aqueous	all	+	+
Acetic acid	100%	+	/ D	Ammonium metaphosphate		+	+
Acetic acid, aqueous	70%	+	+	Ammonium nitrate, aqueous	all	+	+
Acetic acid ethyl ester		+	+	Ammonium phosphate, aqueous	all	+	+
Acetic anhydride		+	/ D	Ammonium sulphate, aqueous	all	+	+
Acetoacetic acid		+		Ammonium sulphide, aqueous	all	+	+
Acetone		+	+ *	Ammonium thiocyanate		+	+
Acetophenone		+		Amyl acetate		+	+
Acetylene		+		Amyl alcohol		+	+
Acids, aromatic		+	+	Amyl chloride	100%	/	-
Acronal dispersions		+	/	Amyl phthalate		+	/
Acrylic acid emulsions		+	+	Aniline, aqueous	all	+	+
Acrylonitrile		+	+	Aniline hydrochloride, aqueous	all	+	+
Adipic acid, aqueous	saturated	+	+	Animal oils		+	/
Adipic acid ester		+	/	Aniseed oil		/	-
Aktivin (chloramine, aqueous, 1%)		+	+	Anisole		/	/ to -
Alcohol		+		Anone (cyclohexanone)		+	/
Alcoholic beverages		+		Antifreeze agents (vehicles)		+	+
Allyl acetate		+	+ to /	Aqua regia		-	
Allyl alcohol	96%	+	+	Anthraquinone sulphonic acid, aqueous (susp.)		+	+
Allyl chloride		/	-	Antimony chloride, anhydrous		+	+
Alum, aqueous	all	+	+	Antimony pentachloride		+	+
Aluminum chloride, aqueous	all	+	+	Antimony trichloride		+	+
Aluminum chloride, solid		+	+	Arsenic acid anhydride		+	+
Aluminum fluoride		+	+	Arsenic acid, aqueous	all	+	+
Aluminum hydroxide		+	+	Ascorbic acid		+	+
Aluminum metaphosphate		+	+	Asphalt		+	/
Aluminum sulphate, aqueous	saturated	+	+	Aspirin		+	
Aluminum sulphate, solid		+	+	Barium hydroxide, aqueous	all	+	+
Amino acids		+	+	Barium salts, aqueous	all	+	+
Ammonia, gaseous	100%	+	+	Battery acid		+	+
Ammonia, liquid		+		Beater glue		+	+
Ammonia solution		+	+	Beef fat		+	+ to /
Ammonium acetate, aqueous	all	+	+				



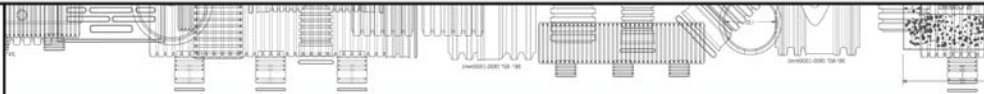
Substance	POLYETHYLENE			Substance	POLYETHYLENE		
	Concentration	68°F	140°F		Concentration	68°F	140°F
Beer		+	+	Butyl alcohol		+	+
Beer coloring agent		+	+	Butyl acrylate		+	/
Beeswax		+	/ to –	Butylbenzyl phthalate		+	+
Benzaldehyde, aqueous	all	+	+ to /	Butylene glycol	technically pure	+	+
Benzaldehyde in isopropyl alcohol	1%	+	+	Butyric acid, aqueous	all	+	/
Benzene	technically pure	/	/	Butylphenol	technically pure	+	+
Benzenesulphonic acid		+	+	Calcium carbide		+	+
Benzoic acid, aqueous	all	+	+	Calcium carbonate		+	+
Benzoyl chloride		/	/	Calcium chloride, aqueous	all	+	+
Benzyl alcohol		+	+	Calcium hydroxide		+	+
Benzyl chloride		/	–	Calcium hypochlorite, aqueous (susp.)	all	+	+
Bichromate-sulphuric acid		+	–	Calcium nitrate, aqueous	50%	+	+
Bismuth salts		+	+	Calcium oxide (powder)		+	+
Bisulphate solution		+	+	Calcium phosphate		+	+
Bitumen		+	/	Calcium sulphate		+	+
Bleaching liquor containing 12.5% active chlorine				Camphor		+	/
Bleaching powder (chloride of lime)		+ to /	–	Camphor oil		–	
Bone oil		+	+	Cane sugar		+	+
Borax, aqueous	all	+	+	Carbazole		+	+
Boric acid, aqueous	all	+	+	Carbolic acid		+	+ D
Boric acid methyl ester		+	+ to –	Carbolineum for fruit trees, aqueous		+ D	/
Boron trifluoride		+	+ to /	Carbon dioxide	100%	+	+
Brake fluid		+	+	Carbon disulphide		/	
Brandy-wine		+	+	Carbonic acid, aqueous	all	+	+
Brine (saturated)	saturated	+	+	Carbonic acid, dry	100%	+	+
Bromic acid		–		Carbon tetrachloride	technically pure	/ to –	–
Bromine fumes		–		Castor oil		+	+
Bromine, liquid	100%	–		Caustic potash		+	+
Bromine water	cold saturated	+		Caustic potash solution	50%	+	+
Bromochloromethane				Caustic soda		+	+
Butanediol, aqueous	all	+	+	Caustic soda solution	all	+	+
Butane, gaseous		+		Cetyl alcohol (hexadecanol)		+	+
Butanetriol, aqueous	all	+	+	Chloral hydrate, aqueous	all	+	+ D
Butanol, aqueous	all	+	+	Chlorine bleach liquor containing 12.5% active chlorine			
Butanone		+	/ to –			+ to /	–
Butoxyl (methoxybutyl acetate)		+	/	Chlorine, gaseous, dry		/	–
Butter		+		Chlorine, gaseous, moist		/	–
Butyl acetate	technically pure	+	/	Chlorine, liquid		–	
n-Butyl acetate		+	/	Chlorine water		+	/
				Chloroacetic acid (mono), aqueous	all	+	+



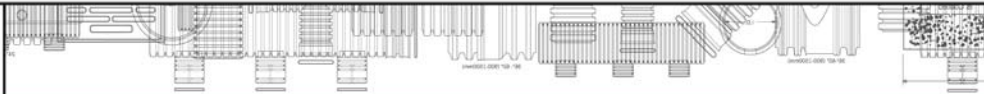
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Chlorobenzene		/	–	Cyclohexanone		+	/
Chlorocarbonic acid		+	/	Decahydronaphthalene (Decalin)	technically pure	+	/
Chloroethanol	technically pure	+	+ D	Defoamers		+	+ to /
Chloroform	technically pure	/ to –	–	Detergents		+	+
Chloropicrin		+ to /	–	Detergents, synthetic		+	+
Chlorosulphonic acid		–		Developer solutions (photographic)		+ D	+ D
Chrome anode mud		+	+	Dextrin, aqueous	18%	+	+
Chrome salts, aqueous	all	+	+	Dextrose		+	+
Chromic acid, aqueous	up to 50%	+	– D	Dextrose, aqueous	all	+	+
Chrome alum, aqueous	all	+	+	1,2-Dibromoethane		/	–
Chromium trioxide, aqueous	up to 50%	+	– D	Dibutyl ether		+ to /	–
Chromosulphuric acid		+	–	Dibutyl phthalate	technically pure	+	/
Cider		+	+	Dibutyl sebacate		+	/
Citric acid, aqueous	saturated	+	+	Dichloroacetic acid	technically pure	+	/
Citrus juices		+	+	Dichloroacetic acid	50%	+	+
Clophen A 50 and A 60		+	/ to –	Dichloroacetic acid methyl ester		+	+
Coal-tar oil		+ D	/	Dichlorobenzene		/	–
Coconut oil		+		Dichloroethane		/	/
Coconut oil fatty alcohol	technically pure	+		Dichlorodiphenyltrichloroethane (DDT, powder)		+	+
Codliver oil		+		Dichloroethylene		–	
Coffee extract		+	+	Dichloropropane		/	–
Cognac		+		Dichloropropene		/	–
Cola concentrates		+	+	Diesel fuel		+	/
Common salt, aqueous	all	+	+	Diethylene glycol		+	+
Copper chloride, aqueous		+	+	Diethyl ether		+ to /	/*
Copper fluoride, aqueous		+	+	Di (2-ethylhexyl) phthalate (DOP)		+	/
Copper nitrate, aqueous	30%	+	+	Diethyl ether		+ to /	/*
Copper salts, aqueous	cold saturated	+	+	Diethyl ketone		+	/
Copper sulphate, aqueous	all	+	+	Diglycolic acid, aqueous	30%	+	+
Corn oil		+	/	Diisobutyl ketone	technically pure	+	/ to –
Corn syrup		+	+	Diisopropyl ether		+ to /	–
Coumarone resins		+	+	Dimethylamine		+	/
Creosote		+	+ D	Dimethyl formamide	technically pure	+	+ to /
Cresol	100%	+	/	Dimethyl sulphoxide		+	+
Cresol, aqueous	diluted	+	+ D	Diocetyl phthalate		+	/
Crop protection agents, aqueous		+	+	Dioxane		+	+
Crotonaldehyde	technically pure	+	/	Diphenylamine		+	/
Cyclanone (fatty alcohol sulphonate)		+	+	Diphenyl oxide		+	/
Cyclohexane		+	+	Dishwashing liquids		+	+
Cyclohexanol		+	+	Disodium phosphate		+	+



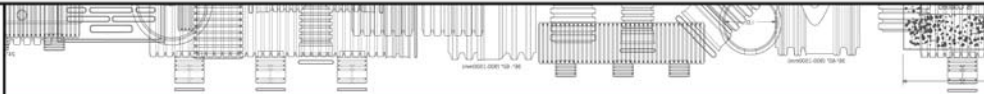
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	Concentration	68°F	140°F		Concentration	68°F	140°F
Disodium sulphate		+	+	Fir wood oil		+	/
Dispersions, aqueous		+		Fluoboric acid, aqueous		+	/ 25%
Dodecylbenzenesulphonic acid		+	/	Fluorine, gaseous		-	
Drilling aid		/	/	Fluosilicic acid	32%	+	+
Drinking water		+	+	Formic acid, aqueous	10%	+	+
Dyes		+ D	+ D	Formic acid, aqueous	85%	+	+
Eau de Javelle		+ to /	-	Formaldehyde, aqueous	up to 40%	+	+
Electrolyte baths for the plating industry		+ to /	/	Formamide		+	+
Emulsifiers		+	+	Frigen 12 (Freon 12)	100%	/	-
Emulsions (photographic)		+	+	Fruit juices, fermented	all	+	+
Ephetin, aqueous	10%	+	+	Fruit juices, unfermented		+	+
Epichlorohydrin		+	+	Fruit pulp		+	+
Epsom salts	all	+	+	Fuel oil		+	/
Essential oils		-	-	Furfural		+	/
Esters, aliphatic	technically pure	+	+ to /	Furfuryl alcohol		+	+ D
Ethane		+	+	Gases from roasting, dry	all	+	+
Ethanol	96%	+	+	Gases liquor (ammoniacal)		+	+
Ether		+ to /	/*	Gelatin		+	+
Ethyl acetate	technically pure	+	/	Genantin		+	+
Ethyl alcohol	96%	+	+	Gin	+		
Ethyl alcohol + acetic acid (fermentation mixture)		+	+	Glacial acetic acid	technically pure	+	/
Ethylbenzene	technically pure			Glauber's salt, aqueous	all	+	+
Ethyl chloride	technically pure	/*		Glucose, aqueous	all	+	+
Ethyl ether	technically pure	+ to /	/*	Glue		+	+
Ethylene		+	/	Glycerine, aqueous	up to 100%	+	+
Ethylenediamine	technically pure	+	+	Glycerol chlorohydrin		+	+
Ethylenediamine tetraacetic acid		+	+	Glycine		+	+
Ethyl dibromide		/	-	Glycol, aqueous		+	+
Ethylene dichloride (dichloroethane)		/	-	Glycolic acid, aqueous	up to 70%	+	+
Ethylene glycol		+	+	Glycolic acid butyl ester		+	+
Ethylene oxide, gaseous	technically pure	+	+	Glysantin		+	+
2-Ethylhexanol		+	/	Grisiron 8302		/	/
Euron B		/	/	Grisiron 8702		+	+
Euron G		+	+	Halothane		/	/ to -
Fatty acid amides		+	/	Heptane		+	/
Fatty acids (>C6)		+	+ to /	Hexane		+	/
Fatty alcohols		+	/	Hexanetriol		+	+
Ferric chloride, aqueous	all	+	+	Honey		+	+
Ferrous sulphate, aqueous	all	+	+	Hydraulic fluid		+	/
Fertilizer salts, aqueous	all	+	+	Hydrazine hydrate		+	+



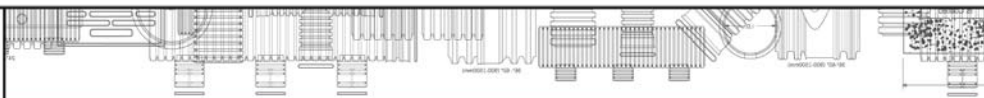
Substance	POLYETHYLENE			Substance	POLYETHYLENE		
	Concentration	68°F	140°F		Concentration	68°F	140°F
Hydrobromic acid, aqueous	50%	+	+	Liquid soaps		+	+
Hydrochloric acid, aqueous	all	+	+	Lithium bromide		+	+
Hydrogen chloride gas, dry and moist		+	+	Lubricating oils	technically pure	+	+ to /
Hydrocyanic acid		+	+	Lysol		+	/
Hydrofluoric acid, aqueous	40%...85%	+	/	Machine oil		+	/
Hydrofluosilicic acid, aqueous	all	+	+	Magnesium carbonate		+	+
Hydrogen	100%	+	+	Magnesium chloride, aqueous	all	+	+
Hydrogen peroxide, aqueous	10%	+	+	Magnesium fluosilicate		+	+
Hydrogen peroxide, aqueous	30%	+	+	Magnesium hydroxide		+	+
Hydrogen peroxide, aqueous	90%	+	-	Magnesium iodide		+	+
Hydrogen sulphide, aqueous	saturated	+	+	Magnesium salts, aqueous	all	+	+
Hydrogen sulphide, dry	100%	+	+	Magnesium sulphate, aqueous	all	+	+
Hydroquinone		+ D	+ D	Maleic acid, aqueous	up to 100%	+	+
Hydrosulphite, aqueous	up to 10%	+	+	Malic acid, aqueous	50%	+	+
Hydroxylamine sulphate, aqueous	12%	+	+	Manganese sulphate		+	+
Hypochlorous acid		+	/	Margarine		+	+
Ink	+	+		Mash		+	+
Iodine - potassium iodide	3% iodine	+	+	Mayonnaise		+	
Iron (III) chloride, aqueous	all	+	+	Menthol		+	/
Isobutyl alcohol		+	+	Mercuric chloride (corrosive sublimate)		+	+
Isooctane		+	/	Mercury		+	+
Isopropanol (isopropyl alcohol)	technically pure	+	+	Mercury salts		+	+
Isopropyl acetate	100%	+	/	Metallic mordants		+	+
Isopropyl ether	technically pure	+ to /	-	Metal soaps		+	+
Jam		+	+	Methacrylate		+	+
Kerosene		+	/	Methacrylic acid		+	+
Ketones		+ to /	/ to -	Methanol	technically pure	+	+
Labarraque's solution		+ to /		Methoxy butanol		+	/
Lactic acid, aqueous	10%...96%	+	+	Methoxybutyl acetate (Butoxyl)		+	/
Lactose		+	+	Methyl alcohol		+	+
Lanolin (wool fat)		+	+	Methylbenzene		/	-
Latex		+	+	Methyl bromide, gaseous	technically pure	/	-
Lead acetate, aqueous	all	+	+	Methyl chloride		/	
Lead tetraethyl		+		Methyl chloride, gaseous	technically pure	/	-
Lime		+	+	Methylcyclohexane		/	/ to -
Limewater		+	+	Methylene chloride		/	/*
Linseed oil	technically pure	+	+	Methyl ethyl ketone	technically pure	+	/ to -
Liquer		+ to /	-	Methyl glycol		+	+
Liquid manure		+	+	Methyl isobutyl ketone		+	/ to -
Liquid paraffin		+	+	Methyl methacrylate		+	+



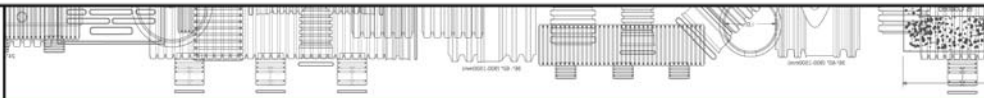
Substance	POLYETHYLENE			Substance	POLYETHYLENE		
	Concentration	68°F	140°F		Concentration	68°F	140°F
4-Methyl-2-pentanone		+	+ to / D	Olive oil		+	+
Methyl propyl ketone		+	/	Optical brighteners		+	+
n-Methyl pyrrolidone		+	+	Orange juice		+	+
Methyl salicylate				Oxalic acid, aqueous	all	+	+
(salicylic acid methyl ester)		+	/	Oxygen	all	+	+
Methyl sulphate	50%	+	+	Ozone	50 ppm	/	-
Milk		+	+	Palmitic acid		+	+ 10%
Mineral oil	without additives	+	+ to /	Palmitic acid		+	+ 70%
Mineral spirits, see White spirit				Palmityl alcohol		+	+
Mineral water		+	+	Palm-kernal oil		+	+
Molasses		+	+	Paraformaldehyde		+	+
Molasses wort		+	+	Pentanol		+	
Monochloroacetic acid		+	+	Peppermint oil		+	
Monochloroacetic acid ethyl ester		+	+	Perchloric acid, aqueous	20%	+	+
Monochloroacetic acid methyl ester		+	+	Perchloric acid, aqueous	50%	+	/
Monochlorobenzene		/	-	Perchloric acid, aqueous	70%	+	-
Morpholine		+	+	Perchloroethylene		/	-
Motor oil (HD oil)		+	+ to /	Perfume oils		/	/ to -
Mould-release agents		+	+	Petrol	technically pure	+	+ to /
Mowilith polymer emulsions		+	+	Petrol/benzene mixture	80/20	+	/
Mustard		+	+	Petroleum		+	/
Nail varnish remover		+	/	Petroleum ether		+	/
Naphtha		+	/	Phenol		+	+ D
Naphthalene		+	/	Phenolic resin moulding materials		+	+
Nickel chloride		+	+	Phenylethyl alcohol		+	+
Nickel nitrate		+	+	Phenylhydrazine	technically pure	/	/ to -
Nickel salts, aqueous		+	+	Phenylhydrazine hydrochloride		+	-
Nickel sulphate, aqueous	all	+	+	Phenylsulphonate			
Nicotine		+	+	(sodium dodecylbenzenesulphonate)		+	+
Nitric acid	25%	+	+	Phosgene, gaseous	100%	-	
Nitric acid	50%	/	- 100%	Phosgene, liquid	100%	-	
Nitrobenzene		+	/	Phosphorus oxichloride		+	/
Nitrocellulose		+		Phosphates, aqueous	all	+	+
o-Nitrotolunene		+	/	Phosphoric acid, aqueous	50%	+	+
Nonyl alcohol (nonanol)		+	+	Phosphoric acid, aqueous	80%..95%	+	/
Octyl cresol	technically pure	/	-	Phosphorus pentoxide	100%	+	+
Oils, animal and vegetable		+	+ to /	Phosphorus trichloride		+	/
Oils, essential		/	-	Photographic developers		+ D	+ D
Oleic acid		+	/	Phthalic acid, aqueous	50%	+	+
Oleum	all	-		Phthalic acid ester		+	+ to /



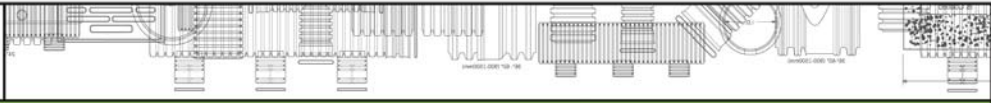
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	Concentration	68°F	140°F		Concentration	68°F	140°F
Picric acid, aqueous	1%	+		n-Propanol (n-propyl alcohol)		+	+
Pineapple juice		+	+	Propargyl alcohol, aqueous	7%	+	+
Pine-needle oil		+	/	Propionic acid, aqueous	all	+	+
Plasticizers		+	/	Propylene dichloride	100%	-	
Polyester plasticizers		+	+ to /	Propylene glycol		+	+
Polyester resins		/	-	Propylene oxide		+	+
Polyglycols		+	+	Pseudocumene		/	/
Polysolvan 0 (glycolic acid n-butyl ester)		+	+	Pyridine		+	/
Potash alum, aqueous	all	+	+	Quinine		+	+
Potassium bicarbonate, aqueous	all	+	+	Rubber dispersions (Latex)		+	+
Potassium bisulphate, aqueous	all	+	+	Sagrotan		+	/
Potassium borate, aqueous	1%	+	+	Salicyclic acid		+	+
Potassium bromate, aqueous	up to 10%	+	+	Saturated steam condensate		+	+
Potassium bromide, aqueous	all	+	+	Sauerkraut		+	+
Potassium carbonate, aqueous	all	+	+	Seawater		+	+
Potassium chlorate, aqueous	all	+	+	Silicic acid, aqueous	all	+	+
Potassium chloride, aqueous	all	+	+	Silicone oil	technically pure	+	+
Potassium chromate, aqueous	40%	+	+	Silver nitrate		+	+
Potassium cyanide, aqueous	all	+	+	Silver nitrate, aqueous	all	+	+
Potassium dichromate, aqueous	all	+	+	Silver salts, aqueous	cold saturated	+	+
Potassium ferricyanide, aqueous	all	+	+	Soap solution, aqueous	all	+	+
Potassium ferricyanide and ferrocyanide, aqueous	all	+	+	Soda, aqueous	all	+	+
Potassium fluoride, aqueous	all	+	+	Sodium acetate, aqueous	all	+	+
Potassium hydroxide, aqueous	30%	+	+	Sodium aluminum sulphate		+	+
Potassium iodide, aqueous	all	+	+	Sodium benzoate		+	+
Potassium nitrate, aqueous	all	+	+	Sodium benzoate, aqueous	35%	+	+
Potassium perborate		+	+	Sodium bicarbonate		+	+
Potassium perchlorate, aqueous	1%	+		Sodium bisulphate		+	+
Potassium perchlorate, aqueous	up to 10%	+	/	Sodium bisulphite, aqueous	all	+	+
Potassium permanganate		+	+	Sodium borate		+	+
Potassium permanganate, aqueous	up to 6%	+	+ D	Sodium bromide		+	+
Potassium persulphate, aqueous	all	+	+	Sodium carbonate, aqueous	all	+	+
Potassium sulphate, aqueous	all	+	+	Sodium chlorate, aqueous	saturated	+	+
Potassium sulphide		+	+	Sodium chloride, aqueous	all	+	+
Potassium sulphite		+	+	Sodium chlorite, aqueous	50%	+	
Potassium tetracyanocuprate		+	+	Sodium chromate		+	+
Potassium thiosulphate		+	+	Sodium cyanide		+	+
Propanol		+	+	Sodium dichromate		+	+
i-Propanol (i-propyl alcohol)	technically pure	+	+	Sodium dodecylbenzenesulphonate		+	+
				Sodium ferrocyanide		+	+



Substance	POLYETHYLENE			Substance	POLYETHYLENE		
	Concentration	68°F	140°F		Concentration	68°F	140°F
Sodium fluoride		+	+	Sulphur dioxide, dry and moist	all	+	+
Sodium hexacyanoferrate		+	+	Sulphurous acid		+	+
Sodium hydroxide, aqueous	all	+	+	Sulphur trioxide		-	wet, gas, dry
Sodium hydroxide, solid		+	+	Sulphuryl chloride			
Sodium hypochlorite, aqueous				Syrup		+	+
with 12.5% active chlorine		+	-	Tallow	technically pure	+	+
Sodium hypochlorite, dry		+		Tannic acid	10%	+	+
Sodium nitrate, aqueous	all	+	+	Tartaric acid, aqueous	all	+	+
Sodium nitrite, aqueous	all	+	+	Tetrabromoethane		/ to -	-
Sodium perborate, aqueous	all	+	/	Tetrachloroethane		/ to -	-
Sodium perchlorate, aqueous		+	+	Tetrachloroethylene			
Sodium peroxide, aqueous	10%	+	+	Tetrahydrofuran	technically pure	+ to -	-
Sodium peroxide, aqueous	saturated	/		Tetrahydronaphthalene (Tetrafin)	technically pure	+	-
Sodium phosphate, aqueous	saturated	+	+	Thioglycolic acid		+	+
Sodium silicate		+	+	Thionyl chloride		-	
Sodium silicate, aqueous	all	+	+	Thiophene		/	-
Sodium sulphate, aqueous	cold saturated	+	+	Tin (II) chloride, aqueous	all	+	+
Sodium sulphide, aqueous	saturated	+	+	Tincture of iodine, DAB 6			
Sodium thiosulphate, aqueous (fixing salt)	all	+	+	(German pharmacopoeia)		+	/
Sodium thiosulphate, aqueous	saturated	+	+	Toluene	technically pure	/	-
Sodium thiosulphate, solid (fixing salt)		+	+	Tomato juice		+	+
Soft soap		+	+	Transformer oil	technically pure	+	/
Soyabean oil		+	+	Tributyl phosphate		+	+
Spermaceti		+	/	Trichloroacetic acid	technically pure	+	/ to -
Spindle oil		+ to /	/	Trichloroacetic acid, aqueous	50%	+	+
Spirits		+	+	Trichloroethylene	technically pure	+ to /	-
Stain removers		+ to /	/	Trichlorobenzene		-	-
Standard mineral spirit (DIN 51635)		+	/	Tricresyl phosphate		+	+
Starch, aqueous	up to 100%	+	+	Triethanolamine		+	+ D
Stearic acid		+	/	Triethylene glycol		+	+
Styrene		/	-	Trilon		+	+
Succinic acid, aqueous	50%	+	+	Trimethyl borate		+	/ to -
Sulphates, aqueous solutions	all	+	+	Trimethylpropane, aqueous		+	+
Sulphur		+	+	Tri-B-chloroethyl phosphate		+	+
Sulphuric acid, aqueous	up to 50%	+	+0...70%	Trioctyl phosphate		+	/
Sulphuric acid, aqueous	70%	+	+ 70..90%	Trisodium phosphate		+	+
Sulphuric acid, aqueous	80%	+	+ 90..100%	Turpentine oil	technically pure	+ to /	/
Sulphuric acid, aqueous	98%	/	-	Tutogen U		+	+
Sulphuric ether		+ to /	/*	Tween 20 and 80		+	-
Sulphur dioxide, aqueous	all	+	+	Two-stroke engine oil		+	/



Substance	POLYETHYLENE		
	Concentration	68°F	140°F
Urea, aqueous	up to 33%	+	+
Uric acid		+	+
Urine		+	+
Vaseline	technically pure	+ to /	/
Vaseline oil	technically pure	+ to /	/
Vinegar (white vinegar)		+	+
Vinyl acetate		+	+
Viscose spinning solutions		+	+
Vitamin C		+	+
Vitamin preparations, dry (powders)		+	+
Walnut oil		+	/
Waste gases, containing carbonic acid	all	+	+
Waste gases, containing carbon monoxide		+	+
Waste gases, containing hydrochloric acid	all	+	+
Waste gases, containing hydrogen fluoride	traces	+	+
Waste gases, containing nitrosyl			
sulphuric acid	traces	+	+
Waste gases, containing SO2	low	+	+
Waste gases, containing			
sulphuric acid (moist)	all	+	+
Water, distilled		+	+
Wax alcohols	technically pure	/	/
Waxes		+	+ to /
Whey		+	+
Whiskey		+	
White spirit	technically pure	+ to /	/
Wine		+	
Wine vinegar		+	+
Wood stains		+	+ to /
Xylene		/	-
Yeast		+	+
Zinc carbonate		+	+
Zinc chloride, aqueous	all	+	+
Zinc oxide		+	+
Zinc salts, aqueous	all	+	+
Zinc sludge		+	+
Zinc stearate		+	+
Zinc sulphate, aqueous	all	+	+



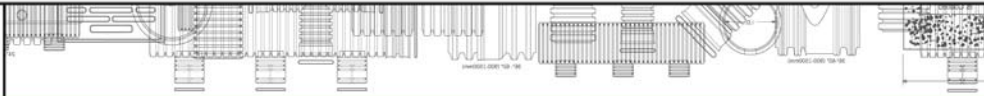
ELASTOMERS

Test Procedure

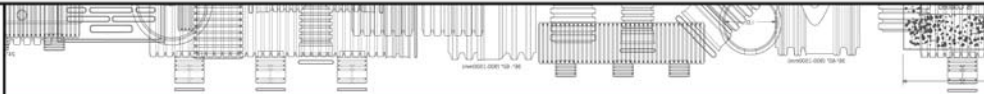
The criteria for the ratings of various elastomers presented here (Natural Rubber, SBR, and EPDM) were primarily volume swell resistance, compression set resistance, and aging resistance. The ratings were developed from specific data or general agreement of the sources identified in the corresponding table enclosed. Several important factors must be considered in the use of rubber parts in service, including:

1. The Temperature of Service: Greater temperatures increase the effect of all chemicals on polymers. The affect of the temperature varies with the polymer and the chemical.
2. Conditions of Service: A compound that swells badly might still function well as a static seal yet fail in dynamic applications.

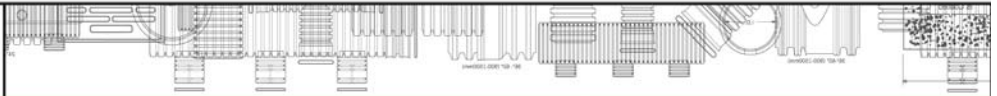
Numbers used in the following table:	
<i>Number</i>	<i>Description</i>
1	Minor effect
2	Moderate effect
3	Static only
4	Not recommended
–	Insufficient data



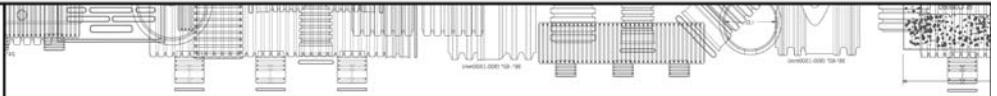
Substance	Natural Rubber (NR, IR)	Styrene Butadiene (SBR, BR)	Ethylene Propylene (EPM, EPDM)	Substance	Natural Rubber (NR, IR)	Styrene Butadiene (SBR, BR)	Ethylene Propylene (EPM, EPDM)
Acetaldehyde	2	3	1	Aroclor, 1254	4	4	3
Acetamide	4	4	1	Aroclor, 1260	1	1	1
Acetic acid, glacial	2	2	1	Arsenic acid	2	1	1
Acetic acid 30%	2	2	1	Arsenic trichloride (aq)	4	4	3
Acetic anhydride	2	2	2	Askarel	4	4	4
Acetone	3	3	1	Asphalt	4	4	4
Acetophenone	4	4	1	Banana oil (amyl acetate)	4	4	3
Acetyl chloride	4	4	4	Barium chloride (aq)	1	1	1
Acetylene	2	2	1	Barium hydroxide (aq)	1	1	1
Acrylonitrile	4	4	4	Barium sulfate (aq)	1	1	1
Adipic acid	1	1	1	Barium sulfide (aq)	1	2	1
Alkazene				Beer	1	1	1
(Dibromoethylbenzene)	4	4	4	Beet sugar liquors	1	1	1
Alum-NH3-Cr-K (aq)	1	1	1	Benzaldehyde	4	4	1
Aluminum acetate (aq)	1	2	1	Benzene	4	4	4
Aluminum chloride (aq)	1	1	1	Bezene sulfonic acid	4	4	3
Aluminum fluoride (aq)	2	1	1	Benzine (Ligroin)			
Aluminum nitrate (aq)	1	1	1	(Nitrobenzine) (pet ether)	4	4	4
Aluminum phosphate (aq)	1	1	1	Benzoic acid	4	4	3
Aluminum sulfate (aq)	1	1	1	Benzoyl chloride	4	4	4
Ammonia anhydrous	4	4	1	Benzyl alcohol	4	4	1
Ammonia gas (cold)	1	1	1	Benzyl benzoate	4	4	2
Ammonia gas (hot)	4	4	2	Benzyl chloride	4	4	4
Ammonium carbonate (aq)	1	1	-	Biphenyl (Diphenyl)			
Ammonium chloride (aq)	1	1	1	(Phenylbenzene)	4	4	4
Ammonium hydroxide (conc.)	4	4	1	Blast furnace gas	4	4	4
Ammonium nitrate (aq)	3	2	1	Bleach solutions	4	4	1
Ammonium nitrite (aq)	1	1	1	Borax	2	2	1
Ammonium persulfate (aq)	1	4	1	Bordeaux mixture	2	2	1
Ammonium phosphate (aq)	1	1	1	Boric acid	1	1	1
Ammonium sulfate (aq)	1	1	1	Brine	1	1	1
Amyl acetate (banana oil)	4	4	3	Bromine-anhydrous	4	4	4
Amyl alcohol	2	2	1	Bromine trifluoride	4	4	4
Amyl borate	4	4	4	Bromine water	4	4	2
Amyl chloronaphthalene	4	4	4	Bromobenzene	4	4	4
Amyl naphthalene	4	4	4	Binker oil	4	4	4
Aniline	4	4	1	Butadiene	4	4	3
Aniline dyes	2	2	1	Butane	4	4	4
Aniline hydrochloride	2	4	2	Butter (animal fat)	4	4	1
Animal fats	4	4	2	Butyl acetate	4	4	3
Ansul ether (anesthetics)	4	4	3	Butyl acetyl ricinoleate	4	4	1
Aqua regia	4	4	3	Butyl acrylate	4	4	4
Aroclor, 1248	4	4	3	Butyl alcohol	1	1	2



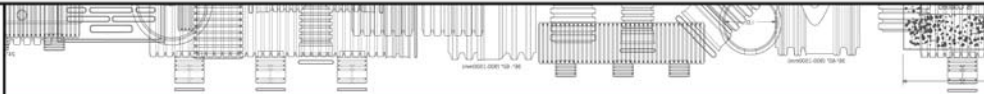
	Natural Rubber	Styrene Butadiene	Ethylene Propylene		Natural Rubber	Styrene Butadiene	Ethylene Propylene
Substance	(NR, IR)	(SBR, BR)	(EPM, EPDM)	Substance	(NR, IR)	(SBR, BR)	(EPM, EPDM)
Butyl amine	4	4	2	Chlorotoluene	4	4	4
Butyl benzoate	3	2	2	Chlorox (sodium hypochlorite NaOCl)	4	4	2
Butyl carbitol	4	4	1	Chrome plating solutions	4	4	2
Butyl cellulose	4	4	1	Chromic acid	4	4	3
Butyl oleate	4	4	2	Citric acid	1	1	1
Butyl stearate	4	4	3	Coal tar (creosote)	4	4	4
Butylene	4	4	4	Cobalt chloride (aq)	1	1	1
Butyraldehyde	4	4	2	Coconut oil	4	4	3
Calcium acetate (aq)	1	4	1	Cod liver oil	4	4	1
Calcium bisulfite (aq)	4	4	4	Coke oven gas	4	4	4
Calcium chloride (aq)	1	1	1	Copper acetate (aq)	1	4	1
Calcium hydroxide (aq)	1	1	1	Copper chloride (aq)	1	1	1
Calcium hypochlorite (aq)	3	3	1	Copper cyanide (aq)	1	1	1
Calcium nitrate (aq)	1	1	1	Copper sulfate (aq)	2	2	1
Calcium sulfide (aq)	2	2	1	Cornoil	4	4	3
Cane sugar liquors	1	1	1	Cottonseed oil	4	4	2
Carbamate	4	4	2	Creosote (Coal tar)	4	4	4
Carbitol	2	2	2	Cresol	4	4	4
Carbolic acid (phenol)	4	4	2	Cresylic acid	4	4	4
Carbon bisulfide	4	4	4	Cumene	4	4	4
Carbon dioxide	2	2	2	Cyclohexane	4	4	4
Carbonic acid	1	2	1	Cyclohexanol	4	4	3
Carbon monoxide	2	2	1	Cyclohexanone	4	4	2
Carbon tetrachloride	4	4	4	P-Cymene	4	4	4
Castor oil	1	1	2	Decalin	4	4	4
Cellosolve	4	4	2	Decane	4	4	4
Cellosolve acetate	4	4	2	Denatured alcohol	1	1	1
Cellulube (Fryquel)	4	4	1	Detergent solutions	2	2	1
China wood oil (Tung oil)	4	4	3	Developing fluids	1	2	2
Chlorine (dry)	4	4	4	Diacetone	4	4	1
Chlorine (wet)	4	4	3	Diacetone alcohol	4	4	1
Chlorine dioxide	4	4	3	Dibenzyl ether	4	4	2
Chlorine trifluoride	4	4	4	Dibenzyl sebacate	4	4	2
Chloroacetic acid	4	4	1	Dibromoethylbenzene			
Chloroacetone	4	4	1	(Alkazene)	4	4	4
Chlorobenzene	4	4	4	Dibutyl amine	4	4	3
Chlorobromomethane	4	4	2	Dibutyl ether	4	4	3
Chlorobutadiene	4	4	4	Dibutyl phthalate	4	4	2
Chlorododecane	4	4	4	Dibutyl sebacate	4	4	2
Chloroform	4	4	4	O-Dichlorobenzene	4	4	4
O-Chloronaphthalene	4	4	4	Dichloro-isopropyl ether	4	4	3
1-Chloro-1-Nitro ethane	4	4	4	Dicyclohexylamine	4	4	4
Chlorosulfonic acid	4	4	4				



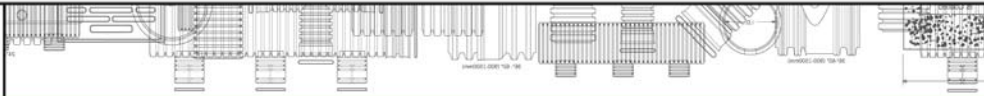
	Natural Rubber	Styrene Butadiene	Ethylene Propylene		Natural Rubber	Styrene Butadiene	Ethylene Propylene
Substance	(NR, IR)	(SBR, BR)	(EPM, EPDM)	Substance	(NR, IR)	(SBR, BR)	(EPM, EPDM)
Diesel oil	4	4	4	Ethyl formate	4	4	2
Diethylamine	2	2	2	Ethyl mercaptan	4	4	3
Diethyl benzene	4	4	4	Ethyl oxalate	1	1	1
Diethyl ether	4	4	4	Ethyl pentachlorobenzene	4	4	4
Diethylene glycol	1	1	1	Ethyl silicate	2	2	1
Diethyl sebacate	4	4	2	Ethylene	3	3	2
Diisobutylene	4	4	4	Ethylene chloride	4	4	3
Diisopropyl benzene	4	4	4	Ethylene chlorohydrin	2	2	2
Diisopropyl ketone	4	4	1	Ethylene diamine	1	2	1
Diisopropylidene acetone				Ethylene dichloride	4	4	3
(Phorone)	4	4	3	Ethylene glycol	1	1	1
Dimethyl aniline (Xylidene)	3	3	2	Ethylene oxide	4	4	3
Dimethyl ether				Ethylene trichloride	4	4	3
(methyl ether)				Fatty acids	4	4	3
(monomethyl ether)	4	4	4	Ferric chloride (aq)	1	1	1
Dimethyl formamide	4	4	2	Ferric nitrate (aq)	1	1	1
Dimethyl phthalate	4	4	2	Ferric sulfate (aq)	1	1	1
Dinitrotoluene	4	4	4	Fishoil	4	4	4
Diocetyl Phthalate	4	4	2	Fluorinated cyclic ethers	4	4	1
Diocetyl Sebacate	4	4	2	Fluorine (liquid)	4	4	4
Dioxane	4	4	2	Fluorobenzene	4	4	4
Dioxolane	4	4	2	Fluoroboric acid	1	1	1
Dipentene	4	4	4	Fluorocarbon oils	2	2	1
Diphenyl (Biphenyl)				Fluorolube	2	3	1
(Phenylbenzene)	4	4	4	Fluorosilicic acid			
Diphenyl oxides	4	4	4	(hydrofluosilicic acid)	2	3	2
Dowtherm oil	4	4	4	Formaldehyde (RT)	2	2	1
Dry cleaning fluids	4	4	4	Formic acid	2	1	1
Epichlorohydrin	4	4	2	Freon 11	4	4	4
Ethane	4	4	4	Freon 12	2	1	2
Ethanolamine	2	2	2	Freon 13	1	1	1
Ethyl acetate	4	4	2	Freon 21	4	4	4
Ethyl acetoacetate	3	3	2	Freon 22	2	1	1
Ethyl acrylate	4	4	2	Freon 31	2	2	1
Ethyl alcohol	1	1	1	Freon 32	1	1	1
Ethyl benzene	4	4	4	Freon 112	4	3	4
Ethyl benzoate	1	1	1	Freon 113	3	2	3
Ethyl cellosolve	4	4	4	Freon 114	1	1	1
Ethyl cellulose	2	2	2	Freon 115	1	1	1
Ethyl chloride	4	4	3	Freon 142b	2	2	2
Ethyl chlorocarbonate	4	4	2	Freon 152a	1	1	1
Ethyl chloroformate	4	4	2	Freon 218	1	1	1
Ethyl ether	4	4	3	Freon C316	1	1	1



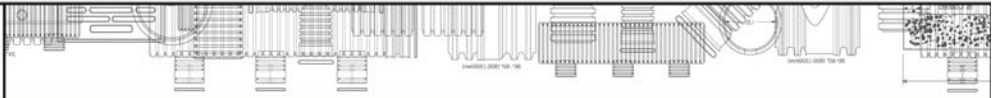
Substance	Natural Rubber	Styrene Butadiene	Ethylene Propylene	Substance	Natural Rubber	Styrene Butadiene	Ethylene Propylene
	(NR, IR)	(SBR, BR)	(EPM, EPDM)		(NR, IR)	(SBR, BR)	(EPM, EPDM)
Freon C318	1	1	1	Hydrofluoric acid (conc.) hot	4	4	4
Freon 13B1	1	1	1	Hydrofluoric acid - anhydrous	4	4	3
Freon 114B2	4	3	4	Hydrofluosilicic acid			
Freon 502	1	1	1	(fluosilicic acid)	2	3	2
Freon TF	4	3	4	Hydrogen gas	2	1	1
Freon T-WD602	4	3	2	Hydrogen peroxide (90%)	4	4	2
Freon TMC	4	4	3	Hydrogen sulfide (wet) cold	4	4	1
Freon T-P35	1	1	1	Hydrogen sulfide (wet) hot	4	4	1
Freon TA	3	3	2	Hydroquinone	2	4	2
Freon TC	4	3	2	Hypochlorous acid	2	4	2
Freon MF	4	4	4	Iodine pentafluoride	4	4	4
Freon BF	4	4	4	Iodoform	4	4	4
Fueloil	4	4	4	Isobutyl alcohol	1	2	1
Fumaric acid	3	3	2	Isooctane	4	4	4
Furan, furfuran	4	4	3	Isophorone	4	4	3
Furfural	4	4	2	Isopropyl acetate	4	4	2
Fyrquel (cellulube)	4	4	1	Isopropyl alcohol	1	2	1
Gallic acid	1	2	2	Isopropyl chloride	4	4	4
Gasoline	4	4	4	Isopropyl ether	4	4	4
Gelatin	1	1	1	Kerosene	4	4	4
Glouber's salt (aq)	2	4	2	Lacquers	4	4	4
Glucose	1	1	1	Lacquer solvents	4	4	4
Glue	2	2	1	Lactic acid (cold)	1	1	1
Glycerin	1	1	1	Lactic acid (hot)	4	4	4
Glycols	1	1	1	Lard	4	4	2
Green sulfate liquor	2	2	1	Lavender oil	4	4	4
Holowax oil	4	4	4	Lead acetate (aq)	1	4	1
N-Hexaldehyde	4	4	1	Lead nitrate (aq)	1	1	1
Hexane	4	4	4	Lead sulfamate (aq)	2	2	1
N-Hexene-1	4	4	4	Ligroin (Benzine)			
Hexyl alcohol	2	2	3	(Nitrobenzine) (pet ether)	4	4	4
Hydrazine	1	1	1	Lime bleach	1	2	1
Hydraulic oil (petroleum)	4	4	4	Lime sulfur	4	4	1
Hydrobromic acid	1	4	1	Lindol (hydraulic fluid)	4	4	1
Hydrobromic acid 40%	1	4	1	Linoleic acid	4	4	4
Hydrochloric acid (cold) 37%	2	2	1	Linseed oil	4	4	3
Hydrochloric acid (hot) 37%	4	4	3	Liquefied petroleum gas	4	4	4
Hydrocyanic acid	2	2	1	Lubricating oils (petroleum)	4	4	4
Hydrofluoro acid (conc.) cold	4	4	3	Lye2	2	1	-



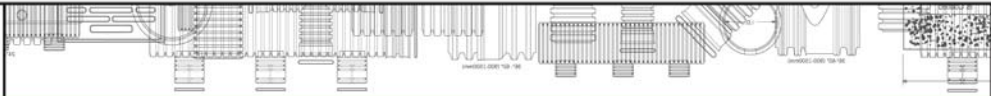
Substance	Natural Rubber	Styrene Butadiene	Ethylene Propylene	Substance	Natural Rubber	Styrene Butadiene	Ethylene Propylene
	(NR, IR)	(SBR, BR)	(EPM, EPDM)		(NR, IR)	(SBR, BR)	(EPM, EPDM)
Magnesium chloride (aq)	1	1	1	Naphthalenic acid	4	4	4
Magnesium hydroxide (aq)	2	2	1	Natural gas	2	2	4
Magnesium sulfate (aq)	2	2	1	Neats foot oil	4	4	2
Maleic acid	3	3	2	Neville acid	4	4	2
Maleic anhydride	3	3	2	Nickel acetate (aq)	1	4	1
Malic acid	3	3	2	Nickel chloride (aq)	1	1	1
Mercury chloride (aq)	1	1	1	Nickel sulfate (aq)	2	2	1
Mercury	1	1	1	Niter cake	1	1	1
Mesityl oxide	4	4	2	Nitric acid (conc.)	4	4	4
Methane	4	4	4	Nitric acid (dilute)	4	4	2
Methyl acetate	3	3	1	Nitric acid - red fuming	4	4	4
Methyl acrylate	4	4	2	Nitrobenzene	4	4	1
Methylacrylic acid	4	4	2	Nitrobenzene (petroleum ether)	4	4	4
Methyl alcohol	1	1	1	Nitroethane	2	2	2
Methyl bromide	4	4	4	Nitrogen	1	1	1
Methyl butyl ketone				Nitrogen tetroxide	4	4	3
(propyl acetone)	4	4	1	Nitromethane	2	2	2
Methyl cellosolve	4	4	2	Octachlorotoluene	4	4	4
Methyl chloride	4	4	3	Octadecane	4	4	4
Methyl cyclopentane	4	4	4	N-Octane	4	4	4
Methylene chloride	4	4	3	Octyl alcohol	2	2	3
Methyl ether (dimethyl ether)				Oleic acid	4	4	4
(monomethyl ether)	4	4	4	Oleum spirits	4	4	4
Methyl ethyl ketone	4	4	1	Olive oil	4	4	2
Methyl formate	4	4	2	O-Dichlorobenzene	4	4	4
Methyl isobutyl ketone	4	4	2	Oxalic acid	2	2	1
Methyl methacrylate	4	4	3	Oxygen - cold	2	2	1
Methyl oleate	4	4	2	Oxygen - (200°-400°F)	4	4	3
Methyl salicylate	3	3	2	Ozone	4	4	1
Milk	1	1	1	Paint thinner, duco	4	4	4
Mineral oil	4	4	3	Palmitic acid	2	2	2
Monochlorobenzene	4	4	4	Peanut oil	4	4	3
Monomethyl aniline	4	4	2	Perchloric acid	4	4	2
Monoethanol amine	2	2	1	Perchloroethylene	4	4	4
Monomethyl ether				Petroleum - below 250°F	4	4	4
(methyl ether)				Petroleum - above 250°F	4	4	4
(dimethyl ether)	4	4	4	Phenol (carbolic acid)	4	-	2
Monovinyl acetylene	2	2	2	Phenylbenzene (biphenyl)			
Mustard gas	1	2	1	(diphenyl)	4	4	4
Naphtha	4	4	4	Phenyl ethyl ether	4	4	4
Naphthalene	4	4	4	Phenyl hydrazine	1	2	2



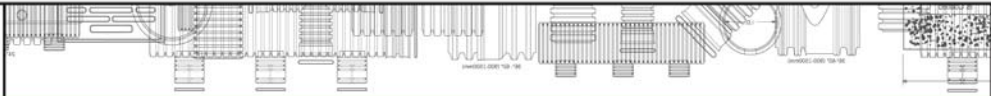
	Natural Rubber	Styrene Butadiene	Ethylene Propylene		Natural Rubber	Styrene Butadiene	Ethylene Propylene
Substance	(NR, IR)	(SBR, BR)	(EPM, EPDM)	Substance	(NR, IR)	(SBR, BR)	(EPM, EPDM)
Phorane (diisopropylidene acetone)	4	4	3	Red oil (MIL-H-5606)	4	4	4
Phosphoric acid - 20%	2	2	1	RJ-1 (MIL-F-25558 B)	4	4	4
Phosphoric acid - 45%	3	3	1	RP-1 (MIL-F-25576 C)	4	4	4
Phosphorus trichloride	4	4	1	Sal ammoniac	1	1	1
Pickling solution	4	4	3	Salicylic acid	1	2	1
Picric acid	2	2	2	Salt water	1	1	1
Pinene	4	4	4	Sewage	2	2	2
Pineoil	4	4	4	Silicate esters	4	4	4
Piperidine	4	4	4	Silicone greases	1	1	1
Plating solution - chrome	4	4	1	Silicone oils	1	1	1
Polyvinyl acetate emulsion	2	4	1	Silver nitrate	1	1	1
Potassium acetate (aq)	1	4	1	Skydrol 55	4	4	1
Potassium chloride (aq)	1	1	1	Skydrol 7000	4	4	1
Potassium cupro cyanide (aq)	1	1	1	Soap solutions	2	1	1
Potassium cyanide (aq)	1	1	1	Soda ash	1	1	1
Potassium dichromate (aq)	2	2	1	Sodium acetate (aq)	1	4	1
Potassium hydroxide (aq)	2	2	1	Sodium bicarbonate (aq)			
Potassium nitrate (aq)	1	1	1	(baking soda)	1	1	1
Potassium sulfate (aq)	2	1	1	Sodium bisulfite (aq)	1	2	1
Producer gas	4	4	4	Sodium borate (aq)	1	1	1
Propane	4	4	4	Sodium chloride (aq)	1	1	1
i-Propyl acetate	4	4	2	Sodium cyanide (aq)	1	1	1
n-Propyl acetate	4	4	2	Sodium hydroxide (aq)	1	1	1
Propyl acetone (methyl butyl ketone)	4	4	1	Sodium hypochlorite (aq) (Clorox)	4	4	2
Propyl alcohol	1	1	1	Sodium metaphosphate (aq)	1	1	1
Propyl nitrate	4	4	2	Sodium nitrate (aq)	2	1	1
Propylene	4	4	4	Sodium perborate (aq)	2	2	1
Propylene oxide	4	4	2	Sodium peroxide (aq)	2	2	1
Pydraul, 10E, 29 ELT	4	4	1	Sodium phosphate (aq)	1	1	1
Pydraul, 30E, 50E, 65E, 90E	4	4	1	Sodium silicate (aq)	1	1	1
Pydraul, 115E	4	4	1	Sodium sulfate (aq)	2	2	1
Pydraul, 230E, 312C, 540C	4	4	4	Sodium thiosulfate (aq)	2	2	1
Pyranol, transformer oil	4	4	4	Soybean oil	4	4	3
Pyridine	4	4	2	Stannic chloride (aq)	1	1	1
Pyroligneous acid	4	4	2	Stannous chloride (aq)	1	1	1
Pyrrole	3	3	3	Steam under 300°F	4	4	1
Radiation	3	3	2	Steam over 300°F	4	4	3
Rapeseed oil	4	4	1	Stearic acid	2	2	2



	Natural Rubber	Styrene Butadiene	Ethylene Propylene		Natural Rubber	Styrene Butadiene	Ethylene Propylene
Substance	(NR, IR)	(SBR, BR)	(EPM, EPDM)	Substance	(NR, IR)	(SBR, BR)	(EPM, EPDM)
Stoddard solvent	4	4	4	Tributyl mercaptan	4	4	4
Styrene	4	4	4	Tributyl phosphate	2	4	2
Sucrose solution	1	1	1	Trichloroacetic acid	3	2	2
Sulfite liquors	2	2	2	Trichloroethane	4	4	4
Sulfur	4	4	1	Trichlorethylene	4	4	4
Sulfur chloride (aq)	4	4	4	Tricresyl phosphate	4	1	4
Sulfur dioxide (dry)	2	2	1	Triethanol amine	2	2	1
Sulfur dioxide (wet)	4	4	1	Triethyl aluminum	4	4	3
Sulfur dioxide (liquified under pressure)	4	4	1	Triethyl borane	4	4	3
Sulfur hexafluoride	4	4	1	Trinitrotoluene	4	4	4
Sulfur trioxide	2	2	2	Trioctyl phosphate	4	4	1
Sulfuric acid (dilute)	3	3	2	Tung oil (China wood oil)	4	4	3
Sulfuric acid (conc.)	4	4	3	Turbine oil	4	4	4
Sulfuric acid (20% oleum)	4	4	4	Turpentine	4	4	4
Sulfurous acid	2	2	2	Unsymmetrical dimethyl hydrazine (UDMH)	1	1	1
Tannic acid	1	2	1	Varnish	4	4	4
Tar, bituminous	4	4	3	Vegetable oils	4	4	3
Tartaric acid	3	4	2	Versilube F-50	1	1	1
Terpineol	4	4	3	Vinegar	2	2	1
Tertiary butyl alcohol	2	2	2	Vinyl chloride	4	4	4
Tertiary butyl catechol	4	2	2	Wagner 21B brake fluid	2	1	1
Tertiary butyl mercaptan	4	4	4	Water	1	1	1
Tetrabromoethane	4	4	4	Whiskey, wines	1	1	1
Tetrabromomethane	4	4	4	White pine oil	4	4	4
Tetrabutyl titanate	2	2	1	White oil	4	4	4
Tetrachloroethylene	4	4	4	Woodoil	4	4	4
Tetraethyl lead	4	4	4	Xylene	4	4	4
Tetrahydrofuran	4	4	3	Xylidine (Di-methyl aniline)	3	3	2
Tetralin	4	4	4	Zeolites	1	1	1
Thionyl chloride	4	4	3	Zinc acetate (aq)	1	4	1
Titanium tetrachloride	4	4	4	Zinc chloride (aq)	1	1	1
Toluene	4	4	4	Zinc sulfate (aq)	2	2	1
Toluene diisocyanate	4	4	2	TT-T-656b	4	4	1
Transformer oil	4	4	4	VV-B-680	2	1	1
Transmission fluid type A	4	4	4	VV-G-632	4	4	4
Triacetin	2	2	1	VV-G-671c	4	4	4
Triaryl phosphate	4	4	1	VV-H-910	2	1	1
Tributoxy ethyl phosphate	2	2	1	VV-I-530a	4	4	4



Substance	Natural Rubber	Styrene Butadiene	Ethylene Propylene	Substance	Natural Rubber	Styrene Butadiene	Ethylene Propylene
	(NR, IR)	(SBR, BR)	(EPM, EPDM)		(NR, IR)	(SBR, BR)	(EPM, EPDM)
VV-K-211d	4	4	4	MIL-J-5624 G JP-3, JP-4, JP-5	4	4	4
VV-K-220a	4	4	4	MIL-O-6081 C	4	4	4
VV-L-751b	4	4	4	MIL-L-6082 C	4	4	4
VV-L-800	4	4	4	MIL-H-6083 C	4	4	4
VV-L-820b	4	4	4	MIL-L-6085 A	4	4	4
VV-L-825a type I	4	4	4	MIL-L-6086 B	4	4	4
VV-L-825a type II	4	4	4	MIL-L-6387 A	4	4	4
VV-L-825a type III	4	4	4	MIL-C-6529 C	4	4	4
VV-O-526	4	4	4	MIL-F-7024 A	4	4	4
VV-P-216a	4	4	4	MIL-H-7083 A	2	1	1
VV-P-236	4	4	4	MIL-G-7118 A	4	4	4
51-F-23	4	4	4	MIL-G-7187	4	4	4
ASTM Method D-471				MIL-G-7421 A	4	4	4
1	4	4	4	MIL-H-7644	2	1	1
2	4	4	4	MIL-L-7645	4	4	4
3	4	4	4	MIL-G-7711 A	4	4	4
MIL-L-644 B	3	3	3	MIL-L-7808 F	4	4	4
MIL-L-2104 B	4	4	4	MIL-L-7870 A	4	4	4
MIL-L-2105 B	4	4	4	MIL-C-8188 C	4	4	4
MIL-G-2108	4	4	4	MIL-A-8243 B	2	1	1
MIL-S-3136 B type I	4	4	4	MIL-L-8383 B	4	4	4
MIL-S-3136 B type II	4	4	4	MIL-H-8446 B (MLO-8515)	4	4	4
MIL-S-3136 B type III	4	4	4	MIL-L-8660 B	1	1	1
MIL-S-3136 B type IV	4	4	4	MIL-L-9000 F	4	4	4
MIL-S-3136 B type V	4	4	4	MIL-T-9188 B	4	4	1
MIL-S-3136 B type VI	4	4	4	MIL-L-9236 B	3	3	3
MIL-S-3136 B type VII	4	4	4	MIL-L-10295 A	4	4	4
MIL-L-3150 A	4	4	4	MIL-L-10324 A	4	4	4
MIL-L-3503	4	4	4	MIL-G-10294 B	4	4	4
MIL-L-3545 B	4	4	4	MIL-L-11734 B	4	4	4
MIL-C-4339 C	4	4	4	MIL-O-11773	4	4	4
MIL-G-4343 B	4	4	3	MIL-P-12098	2	1	1
MIL-L-5020 A	4	4	4	MIL-H-13862	4	4	4
MIL-J-5161 F	4	4	4	MIL-H-13866 A	4	4	4
MIL-C-5545 A	4	4	4	MIL-H-13910 B	2	1	1
MIL-H-5559 A	2	1	1	MIL-H-13919 A	4	4	4
MIL-F-5566	1	1	1	MIL-L-14107 B	4	4	4
MIL-F-5602	4	4	4	MIL-L-15017	4	4	4
MIL-H-5606 B (red oil)	4	4	4	MIL-L-15015 B	4	4	4



Substance	Natural Rubber	Styrene Butadiene	Ethylene Propylene	Substance	Natural Rubber	Styrene Butadiene	Ethylene Propylene
	(NR, IR)	(SBR, BR)	(EPM, EPDM)		(NR, IR)	(SBR, BR)	(EPM, EPDM)
MIL-L-15019 C	4	4	4	MIL-H-46001 A	4	4	4
MIL-L-15719 A	3	2	2	MIL-L-46002	4	4	4
MIL-G-15793	4	4	4	MIL-H-46004	4	4	4
MIL-F-16929 A	4	4	4	MIL-P-46046 A	2	1	1
MIL-L-16958 A	4	4	4	MIL-H-81019 B	4	4	4
MIL-F-17111	4	4	4	MIL-S-81087	1	1	1
MIL-L-17331 D	4	4	4	O-A-548 a	2	1	1
MIL-L-17353 A	4	4	4	O-T-634 b	4	4	4
MIL-L-17672 B	4	4	4	P-S-661 b	4	4	4
MIL-L-18486 A	4	4	4	P-D-680	4	4	4
MIL-G-18709 A	4	4	4	TT-N-95 a	4	4	4
MIL-H-19457 B	4	4	1	TT-N-97 b	4	4	4
MIL-F-19605	4	4	4	TT-I-735 b	1	1	1
MIL-L-19701	4	4	4	TT-S-735 type I	4	4	4
MIL-21260	4	4	4	TT-S-735 type II	4	4	4
MIL-S-21568 A	2	1	1	TT-S-735 type III	4	4	4
MIL-H-22072	2	1	1	TT-S-735 type IV	4	4	4
MIL-L-22396	4	4	4	TT-S-735 type V	4	4	4
MIL-L-23699 A	4	4	4	TT-S-735 type VI	4	4	4
MIL-G-23827 A	4	4	4	TT-S-735 type VII	4	4	4
MIL-G-25013 D	2	1	1				
MIL-F-25172	4	4	4				
MIL-L-25336 B	4	4	4				
MIL-F-25524 A	4	4	4				
MIL-G-25537 A	4	4	4				
MIL-F-25558 B (RJ-1)	4	4	4				
MIL-F-25576 C (RP-1)	4	4	4				
MIL-H-25598	4	4	4				
MIL-F-25656 B	4	4	4				
MIL-L-25681 C	2	1	1				
MIL-G-25760 A	3	3	4				
MIL-L-25968	4	4	4				
MIL-L-26087 A	4	4	4				
MIL-G-27343	1	1	1				
MIL-H-27601 A	4	4	4				
MIL-G-27617	-	2	1				
MIL-I-27686 D	2	1	1				
MIL-L-27694 A	1	1	1				
MIL-L-46000 A	4	4	4				



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