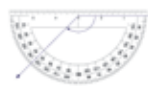
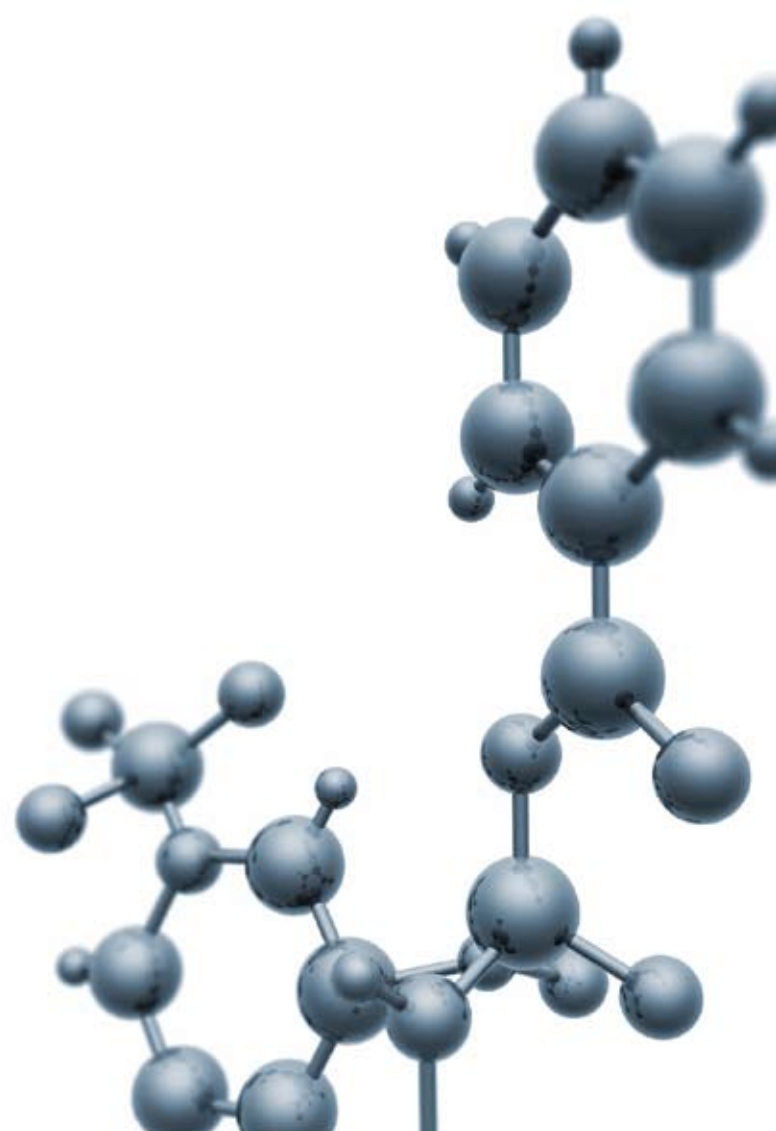
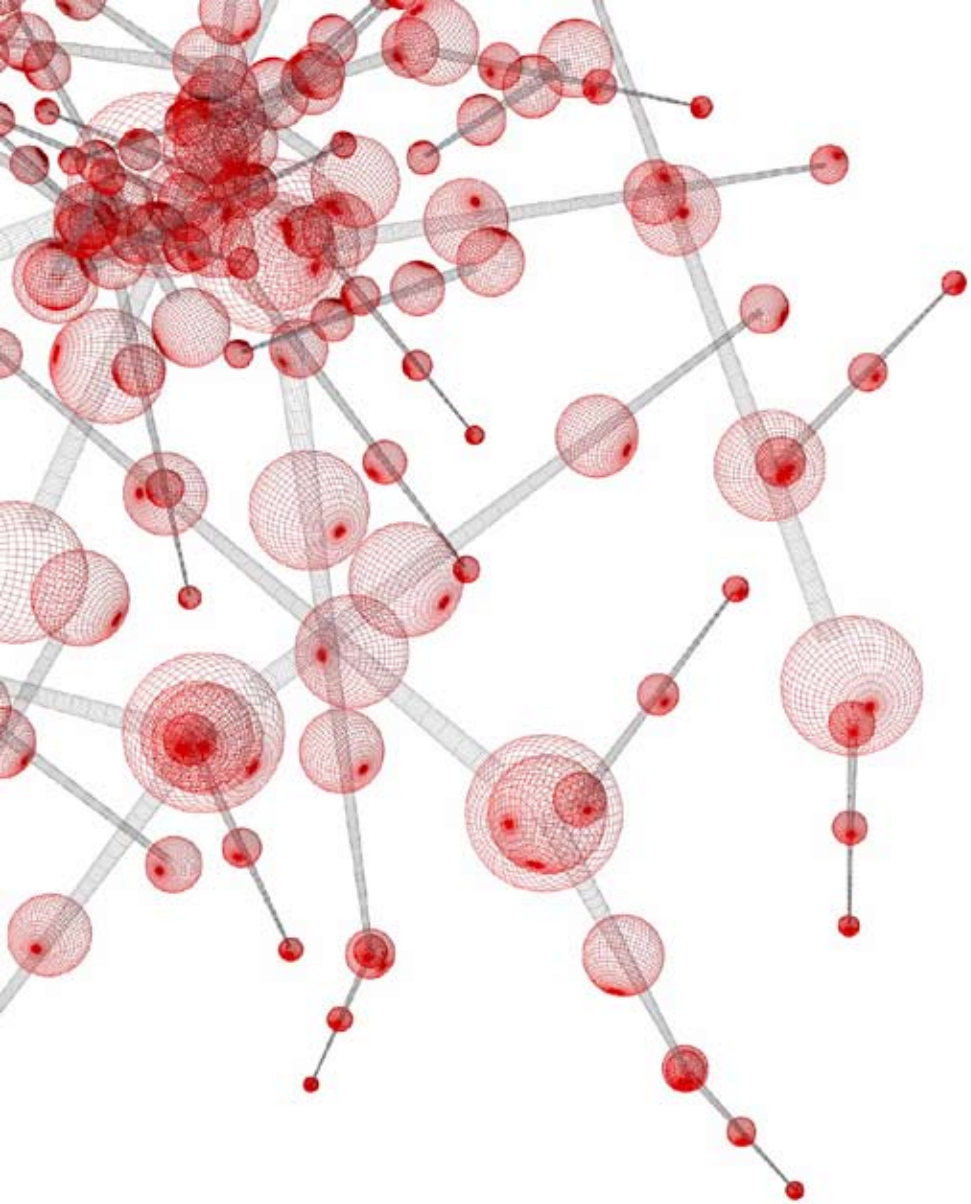
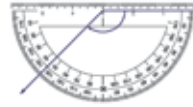


# Chemical Resistance Chart



**Rubber  
Cal™**



The chemical resistance guide has been compiled to assist in selecting chemical resistant materials. This information is intended as a guide only. Many conditions can affect material choices. Careful consideration must be given to temperature, pressure, and chemical concentrations before a final material can be selected. The compound should be tested under actual service conditions to ensure compatibility.

The criteria used for the ratings were primarily volume swell resistance, and in addition, aging resistance. For the most part the ratings were arrived from specific data or general agreement of the above sources. When no data or agreement was found, the ratings were arrived at by theory and analogy. In some cases they are the considered opinion of experienced compounders. We cannot guarantee their accuracy nor assume responsibility for their use.

Several factors must always be considered when using a rubber part in service. The most important as we see them are:

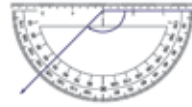
- a. **The temperature of service.** Higher temperatures increase the effect of all chemicals on polymers. The increase varies with the polymer and the chemical. A compound quite suitable at room temperature might fail miserably at elevated temperatures.
- b. **Conditions of service.** A compound that swells badly might still function well as a static seal yet fail in a dynamic application.
- c. **The grade of polymer.** Many types of polymers are available in different grades that vary greatly in chemical resistance
- d. **The compound itself.** Compounds designed for other outstanding properties may be poorer in performance in a chemical than one designed especially for fluid resistance.

*In light of these factors, it is always best to test.*

Each polymer is rated for use in individual chemicals at a room temperature. Where multiple chemicals are in use, refer to the rating of the most aggressive fluid when evaluating polymer performance. Polymers are rated as:

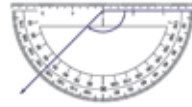
1. **Recommended.** Little or minor effect, 0-5% volume swell where applicable.
  2. **Minor to moderate effect.** Rubber parts probably still useful in most applications, 5-10% volume swell where applicable.
  3. **Moderate to severe effect.** Rubber parts useful in some static applications only. 10-20% volume swell where applicable.
  4. **Not recommended.**
- No data available or insufficient evidence.

	MATERIAL	CHEMICAL GROUP	GENERALLY RESISTANT TO	GENERALLY ATTACKED BY
<b>NR, IR</b>	Natural rubber, Isoprene	Polyisoprene	Most moderate wet or dry chemicals, organic acids, alcohols, ketones, aldehydes	Ozone, strong acids, fats, oils, greases, most hydrocarbons
<b>SBR, BR</b>	Butadiene, Styrene butadiene	Styrene, Butadiene Copolymer; Polybutadiene	Similar to natural rubber	Similar to natural rubber
<b>EPM, EPDM</b>	Ethylene propylene	Isobutylene, Isoprene, Polymer	Water, steam and brake fluids	Mineral oils and solvents, aromatic hydrocarbons
<b>NBR</b>	Nitrile	Ethylene Propylene copolymer and terpolymer	Many hydrocarbons, fats, oils, greases, hydraulic fluids, chemicals	Ozone, ketones, esters, aldehydes, chlorinated and nitro hydrocarbons
<b>CR</b>	Neoprene	Chloroprene polymer	Moderate chemicals and acids, ozone, oils, fats, greases, many oils, and solvents	Strong oxidizing acids, esters, ketones, chlorinated, aromatic and nitro hydrocarbons
<b>SI</b>	Silicone	Organic silicone polymer	Moderate or oxidizing chemicals, ozone, concentrated sodium hydroxide	Many solvents, oils, concentrated acids, dilute sodium hydroxide
<b>TPI</b>	Santoprene	Thermoplastic rubber	Temperature, oils, ozone	Concentrated solvents, acids



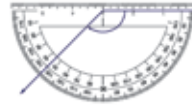
	NR	SBR	EPDM	NBR	CR	SI	TPR
Acetaldehyde	2	3	1	4	3	2	1
Acetamide	4	4	1	1	2	2	
Acetic Acid, Glacial	2	2	1	3	4	2	
Acetic Acid, 30%	2	2	1	2	1	1	
Acetic Anhydride	2	2	2	3	2	3	1
Acetone	3	3	1	4	3	3	2
Acetophenone	4	4	1	4	4	4	
Acetyl Chloride	4	4	4	4	4	3	
Acetylene	2	2	1	1	2	2	1
Acrylonitrile	4	4	4	4	4	4	1
Adipic Acid	1	1	1	1	1		
Alkazene (Dibromoethylbenzene)	4	4	4	4	4	4	
Alum-NH3-Cr-K (aq)	1	1	1	1	1	1	
Aluminum Acetate (aq)	1	2	1	2	2	4	2
Aluminum Chloride (aq)	1	1	1	1	1	2	1
Aluminum Fluoride (aq)	2	1	1	1	1	2	
Aluminum Nitrate (aq)	1	1	1	1	1	2	
Aluminum Phosphate (aq)	1	1	1	1	1	1	
Aluminum Sulfate (aq)	1	1	1	1	1	1	1
Ammonia Anhydrous	4	4	1	2	1	3	2
Ammonia Gas (cold)	1	1	1	1	1	1	
Ammonia Gas (hot)	4	4	2	4	2	1	
Ammonium Carbonate (aq)	1	1	---	4	1	---	
Ammonium Chloride (aq)	1	1	1	1	1		1
Ammonium Hydroxide (conc.)	4	4	1	4	1	1	1
Ammonium Nitrate (aq)	3	2	1	1	1	---	
Ammonium Nitrite (aq)	1	1	1	1	1	2	
Ammonium Persulfate (aq)	1	4	1	4	1	---	
Ammonium Phosphate (aq)	1	1	1	1	1	1	
Ammonium Sulfate (aq)	1	1	1	1	1	---	
Amyl Acetate (Banana Oil)	4	4	3	4	4	4	1
Amyl Alcohol	2	2	1	2	2	4	1
Amyl Borate	4	4	4	1	1	---	
Amyl Chloronaphalene	4	4	4	4	4	4	
Amyl Nathalene	4	4	4	4	4	4	
Aniline	4	4	1	4	4	4	1
Aniline Dyes	2	2	1	4	2	3	
Aniline Hydrochloride	2	4	2	2	4	4	
Animal Fats	4	4	2	1	2	2	
Ansul Ether (Anesthetics)	4	4	3	3	4	4	
Aqua Regia	4	4	3	4	4	4	
Aroclor, 1248	4	4	3	3	4	2	
Aroclor, 1254	4	4	3	4	4	3	
Aroclor, 1260	1	1	1	1	1	2	
Arsenic Acid	2	1	1	1	1	1	
Arsenic Trichloride (aq)	4	4	3	1	1	---	
Askarel	4	4	4	2	4	4	
Asphalt	4	4	4	2	2	4	4
Banana Oil (Amyl Acetate)	4	4	3	4	4	4	
Barium Chloride (aq)	1	1	1	1	1	1	
Barium Hydroxide (aq)	1	1	1	1	1	1	1
Barium Sulfate (aq)	1	1	1	1	1	1	
Barium Sulfide (aq)	1	2	1	1	1	1	
Beer	1	1	1	1	1	1	1
Beet Sugar Liquors	1	1	1	1	2	1	
Benzaldehyde	4	4	1	4	4	2	2
Benzene	4	4	4	4	4	4	2
Benzene Sulfonic Acid	4	4	3	4	2	4	
Benzine (Ligroin)(Nitrobenzene)(Pet Ether)	4	4	4	1	2	4	

	NR	SBR	EPDM	NBR	CR	SI	TPR
Benzoic Acid	4	4	3	3	4	3	1
Benzoyl Chloride	4	4	4	4	4	---	4
Benzyl Alcohol	4	4	1	4	2	2	2
Benzyl Benzoate	4	4	2	4	4	---	
Benzyl Chloride	4	4	4	4	4	4	
Biphenyl (Diphenyl) (Phenylbenzene)	4	4	4	4	4	4	
Blast Furnace Gas	4	4	4	4	4	4	1
Bleach Solutions	4	4	1	4	4	2	
Borax	2	2	1	2	1	2	
Bordeaux Mixture	2	2	1	2	2	2	
Boric Acid	1	1	1	1	1	1	1
Brine	1	1	1	1	1	1	1
Bromine-Anhydrous	4	4	4	4	4	4	4
Bromine Trifluoride	4	4	4	4	4	4	
Bromine Water	4	4	2	4	4	4	
Bromobenzene	4	4	4	4	4	4	
Bunker Oil	4	4	4	1	4	2	
Butadiene	4	4	3	4	4	4	
Butane	4	4	4	1	1	4	2
Butter (Animal Fat)	4	4	1	1	2	2	
Butyl Acetate	4	4	3	4	4	4	4
Butyl Acetyl Ricinoleate	4	4	1	3	2	---	
Butyl Acrylate	4	4	4	4	4	---	
Butyl Alcohol	1	1	2	1	1	2	
Butyl Amine	4	4	2	3	4	4	
Butyl Benzoate	3	2	2	4	4	---	
Butyl Carbitol	4	4	1	4	3	4	
Butyl Cellosolve	4	4	1	3	3	---	
Butyl Oleate	4	4	2	4	4	---	
Butyl Stearate	4	4	3	2	4	---	
Butylene	4	4	4	2	3	4	
Butyraldehyde	4	4	2	4	3	4	2
Calcium Acetate (aq)	1	4	1	2	2	4	
Calcium Bisulfite (aq)	4	4	4	4	1	1	
Calcium Chloride (aq)	1	1	1	1	1	1	1
Calcium Hydroxide (aq)	1	1	1	1	1	1	2
Calcium Hypochlorite (aq)	3	3	1	2	3	2	
Calcium Nitrate (aq)	1	1	1	1	1	2	
Calcium Sulfide (aq)	2	2	1	1	1	2	
Cane Sugar Liouors	1	1	1	1	1	1	1
Carbamate	4	4	2	3	2	---	
Carbiol	2	2	2	2	2	2	
Carbolic Acid (Phenol)	4	4	2	4	3	4	
Carbon Bisulfide	4	4	4	3	4	4	
Carbon Dioxide	2	2	2	1	2	2	1
Carbonic Acid	1	2	1	2	1	1	
Carbon Monoxide	2	2	1	1	2	1	4
Carbon Tetrachloride	4	4	4	3	4	4	4
Castor Oil	1	1	2	1	1	1	
Cellosolve	4	4	2	4	4	4	
Cellosolve Acetate	4	4	2	4	4	4	
Cellube (Fryquel)	4	4	1	4	4	1	
China Wood Oil (Tung Oil)	4	4	3	1	2	4	
Chlorine (Dry)	4	4	4	4	3	4	1
Chlorine (Wet)	4	4	3	4	3	4	1
Chlorine Dioxide	4	4	3	4	4	---	
Chlorine Trifluoride	4	4	4	4	4	4	
Chloroacetic Acid	4	4	1	4	4	---	1



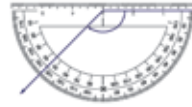
	NR	SBR	EPDM	NBR	CR	SI	TPR
Chloroacetone	4	4	1	4	3	4	
Chlorobenzene	4	4	4	4	4	4	4
Chlorobromomethane	4	4	2	4	4	4	
Chlorobutadiene	4	4	4	4	4	4	
Chlorododecane	4	4	4	4	4	4	
Chloroform	4	4	4	4	4	4	2
O-Chloronaphthalene	4	4	4	4	4	4	2
1-Chloro-1Nitro Ethane	4	4	4	4	4	4	
Chlorosulfonic Acid	4	4	4	4	4	4	4
Chlorotoluene	4	4	4	4	4	4	
Chlorox (Sodium Hypochlorite NaOCl)	4	4	2	2	1	2	
Chrome Plating Solutions	4	4	2	4	4	2	
Chromic Acid	4	4	3	4	3	3	
Citric Acid	1	1	1	1	1	1	1
Coal Tar (Creosote)	4	4	4	1	2	4	
Cobalt Chloride (aq)	1	1	1	1	1	2	
Cocanut Oil	4	4	3	1	2	1	
Cod Liver Oil	4	4	1	1	2	2	
Coke Oven Gas	4	4	4	4	4	2	
Copper Acetate (aq)	1	4	1	2	2	4	
Copper Chloride (aq)	1	1	1	1	2	1	
Copper Cyanide (aq)	1	1	1	1	1	1	
Copper Sulfate (aq)	2	2	1	1	1	1	
Corn Oil	4	4	3	1	3	1	
Cottonseed Oil	4	4	2	1	2	1	1
Creosote (Coal Tar)	4	4	4	1	2	4	
Cresol	4	4	4	4	3	4	
Cresylic Acid	4	4	4	4	3	4	
Cumene	4	4	4	4	4	4	
Cyclohexane	4	4	4	1	3	4	4
Cyclohexanol	4	4	3	3	1	4	
Cyclohexanone	4	4	2	4	4	4	2
P-Cymene	4	4	4	4	4	4	
Decalin	4	4	4	4	4	4	
Decane	4	4	4	1	4	2	
Denatured Alcohol	1	1	1	1	1	1	
Detergent Solutions	2	2	1	1	2	1	
Developing Fluids	1	2	2	1	1	1	
Diacetone	4	4	1	4	4	4	
Diacetone Alcohol	4	4	1	4	2	2	
Dibenzyl Ether	4	4	2	4	3	---	
Dibenzyl Sebecate	4	4	2	4	4	3	
Dibromoethylbenzene (Alkazene)	4	4	4	4	4	4	
Dichloro-Isopropyl Ether	4	4	3	4	4	4	
Dicyclohexylamine	4	4	4	3	4		
Diesel Oil	4	4	4	1	3	4	
Diethylamine	2	2	2	2	2	2	
Diethyl Benzene	4	4	4	4	4	4	
Diethyl Ether	4	4	4	4	3	4	1
Diethylene Glycol	1	1	1	1	1	2	2
Diethyl Sebecate	4	4	2	2	4	2	
Diisobutylene	4	4	4	2	4	4	
Diisopropyl Benzene	4	4	4	4	4	---	
Diisopropyl Ketone	4	4	1	4	4	4	
Diisopropylidene Acetone (Phorone)	4	4	3	4	4	4	
Dimethyl Aniline (Xylidine)	3	3	2	3	3	4	
Dimethyl Ether (Methyl Ether)	4	4	4	1	3	1	
(Monomethyl Ether)							

	NR	SBR	EPDM	NBR	CR	SI	TPR
Dimethyl Formamide	4	4	2	2	3	2	1
Dimethyl Phthalate	4	4	2	4	4	---	
Dinitrotoluene	4	4	4	4	4	4	
Diocetyl Phtalate	4	4	2	3	4	3	2
Diocetyl Sebecate	4	4	2	4	4	3	
Dioxane	4	4	2	4	4	4	4
Dioxolane	4	4	2	4	4	4	
Dipentene	4	4	4	2	4	4	
Diphenyl (Biphenyl) (Phenylbenzene)	4	4	4	4	4	4	
Diphenyl Oxides	4	4	4	4	4	3	
Dowtherm Oil	4	4	4	4	4	3	
Dry Cleaning Fluids	4	4	4	3	4	4	
Epichlorohydrin	4	4	2	4	4	4	2
Ethane	4	4	4	1	2	4	
Ethanolamine	2	2	2	2	2	2	
Ethyl Acetate	4	4	2	4	3	2	2
Ethyl Acetoacetate	3	3	2	4	3	2	
Ethyl Acrylate	4	4	2	4	4	2	
Ethyl Alcohol	1	1	1	1	1	1	2
Ethyl Benzene	4	4	4	4	4	4	
Ethyl Benzoate	1	1	1	4	4	4	
Ethyl Cellosolve	4	4	4	4	4	4	
Ethyl Cellulose	2	2	2	2	2	3	
Ethyl Chloride	4	4	3	1	4	4	4
Ethyl Chlorocarbonate	4	4	2	4	4	4	
Ethyl Chloroformate	4	4	2	4	4	4	
Ethyl Ether	4	4	3	3	3	4	
Ethyl Formate	4	4	2	4	2	---	
Ethyl Mercaptan	4	4	3	4	3	3	
Ethyl Oxalate	1	1	1	4	3	4	
Ethyl Pentachlorobenzene	4	4	4	4	4	4	
Ethyl Silicate	2	2	1	1	1	---	
Ethylene	3	3	2	1	3	---	
Ethylene Chloride	4	4	3	4	4	4	
Ethylene Chlorohydrin	2	2	2	4	2	3	
Ethylene Diamine	1	2	1	1	1	1	
Ethylene Dichloride	4	4	3	4	4	4	
Ethylene Glycol	1	1	1	1	1	1	1
Ethylene Oxide	4	4	3	4	4	4	
Ethylene Trichloride	4	4	3	4	4	4	
Fatty Acids	4	4	3	2	2	3	
Ferric Chloride (aq)	1	1	1	1	1	2	1
Ferric Nitrate (aq)	1	1	1	1	1	3	
Ferric Sulfate (aq)	1	1	1	1	1	2	
Fish Oil	4	4	4	1	4	1	
Fluorinated Cyclic Ethers	4	4	1	---	4	---	
Fluorine (Liquid)	4	4	4	4	4	4	
Fluorobenzene	4	4	4	4	4	4	
Fluoroboric Acid	1	1	1	1	1	---	1
Fluorocarbon Oils	2	2	1		2	---	
Fluorolube	2	3	1	1	2	1	
Fluorosilicic Acid (Hydrofluosilicic Acid)	2	3	2	1	2	4	1
Formaldehyde (RT)	2	2	1	3	2	2	1
Formic Acid	2	1	1	2	1	2	1
Freon 11	4	4	4	2	3	4	3
Freon 12	2	1	2	1	1	4	2
Freon 13	1	1	1	1	1	4	



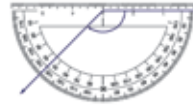
	NR	SBR	EPDM	NBR	CR	SI	TPR
Freon 21	4	4	4	4	4	4	
Freon 22	2	1	1	4	1	4	4
Freon 31	2	2	1	4	2	---	
Freon 32	1	1	1	1	1	---	
Freon 112	4	3	4	2	3	4	
Freon 113	3	2	3	1	1	4	4
Freon 114	1	1	1	1	1	4	4
Freon 115	1	1	1	1	1	---	
Freon 142b	2	2	2	1	1	---	
Freon 152a	1	1	1	1	1	---	
Freon 218	1	1	1	1	1	---	
Freon C316	1	1	1	1	1	---	
Freon C318	1	1	1	1	1	---	
Freon 12B1	1	1	1	1	1	4	
Freon 114B2	4	3	4	2	3	4	
Freon 502	1	1	1	2	1	---	
Freon TF	4	3	4	1	1	4	
Freon T-WD602	4	3	2	2	2	4	
Freon TMC	4	4	3	2	3	3	
Freon T-P35	1	1	1	1	1	1	
Freon TA	3	3	2	1	2	3	
Freon TC	4	3	2	1	1	4	
Freon MF	4	4	4	1	3	4	
Freon BF	4	4	4	2	3	4	
Fuel Oil	4	4	4	1	2	4	
Fumaric Acid	3	3	2	1	2	2	
Furan, Furfuran	4	4	3	4	4	---	
Furfural	4	4	2	4	3	4	2
Fyrquel (cellulube)	4	4	1	4	4	1	
Gallic Acid	1	2	2	2	2	---	
Gasoline	4	4	4	2	3	4	
Gelatin	1	1	1	1	1	1	
Glauber's Salt (aq)	2	4	2	4	2	---	
Glucose	1	1	1	1	1	1	1
Glue	2	2	1	1	1	1	1
Glycerin	1	1	1	1	1	1	1
Glycols	1	1	1	1	1	1	
Green Sulfate Liquor	2	2	1	2	2	1	
Halowax Oil	4	4	4	4	4	4	
N-Hexaldehyde	4	4	1	4	1	2	
Hexane	4	4	4	1	2	4	
N-Hexene-1	4	4	4	2	2	4	4
Hexyl Alcohol	2	2	3	1	2	2	
Hydrazine	1	1	1	2	2	3	
Hydraulic Oil (Petroleum)	4	4	4	1	2	3	
Hydrobromic Acid	1	4	1	4	4	4	
Hydrobromic Acid 40%	1	4	1	4	2	4	
Hydrochloric Acid (Cold) 37%	2	2	1	3	2	3	
Hydrochloric Acid (Hot) 37%	4	4	3	4	4	4	
Hydrocyanic Acid	2	2	1	2	2	3	
Hydrofluoric Acid (Conc.) Cold	4	4	3	4	4	4	
Hydrofluoric Acid (Conc.) Hot	4	4	4	4	4	4	
Hydrofluoric Acid-Anhydrous	4	4	3	4	4	4	4
Hydrofluosilicic Acid (Fluosilicic Acid)	2	3	2	1	2	4	
Hydrogen Gas	2	1	1	1	1	3	
Hydrogen Peroxide (90%)	4	4	2	4	4	2	2
Hydrogen Sulfide (Wet) Cold	4	4	1	4	2	3	
Hydrogen Sulfide (Wet) Hot	4	4	1	4	3	3	

	NR	SBR	EPDM	NBR	CR	SI	TPR
Hydroquinone	2	4	2	3	4	---	
Hypochlorous Acid	2	4	2	4	4	---	
Iodine Pentafluoride	4	4	4	4	4	4	
Iodofom	4	4	4	---	4	---	
Isobutyl Alcohol	1	2	1	2	1	1	
Isooctane	4	4	4	1	2	4	
Isophorone	4	4	3	4	4	4	
Isopropyl Acetate	4	4	2	4	4	4	
Isopropyl Alcohol	1	2	1	2	2	1	2
Isopropyl Chloride	4	4	4	4	4	4	
Isopropyl Ether	4	4	4	2	3	4	
Kerosene	4	4	4	1	2	4	4
Lacquers	4	4	4	4	4	4	4
Lacquer Solvents	4	4	4	4	4	4	
Lactic Acid (Cold)	1	1	1	1	1	1	
Lactic Acid (Hot)	4	4	4	4	4	2	
Lard	4	4	2	1	2	2	
Lavender Oil	4	4	4	2	4	4	
Lead Acetate (aq)	1	4	1	2	2	4	
Lead Nitrate (aq)	1	1	1	1	1	2	
Lead Sulfamate (aq)	2	2	1	2	1	2	
Ligroin (Benzine) (Nitrobenzine) (Pet Ether)	4	4	4	1	2	4	
Lime Bleach	1	2	1	1	2	2	
Lime Sulfur	4	4	1	4	1	1	
Lindol (Hydraulic Fluid)	4	4	1	4	4	3	
Linoleic Acid	4	4	4	2	4	2	
Linseed Oil	4	4	3	1	2	1	1
Liquefied Petroleum Gas	4	4	4	1	2	3	
Lubricating Oils (Petroleum)	4	4	4	1	2	4	
Lye	2	2	1	2	2	2	
Magnesium Chloride (aq)	1	1	1	1	1	1	1
Magnesium Hydroxide (aq)	2	2	1	2	1	---	1
Magnesium Sulfate (aq)	2	2	1	1	1	1	
Maleic Acid	3	3	2	4	3	---	1
Maleic Anhydride	3	3	2	4	3	---	
Malic Acid	3	3	2	1	3	2	
Mercury Chloride (aq)	1	1	1	1	1	---	
Mercury	1	1	1	1	1	---	1
Mesityl Oxide	4	4	2	4	4	4	
Methane	4	4	4	1	2	4	
Methyl Acetate	3	3	1	4	2	4	2
Methyl Acrylate	4	4	2	4	2	4	
Methylacrylic Acid	4	4	2	4	2	4	
Methyl Alcohol	1	1	1	1	1	1	1
Methyl Bromide	4	4	4	2	4	---	4
Methyl Butyl Detone (Propyl Acetone)	4	4	1	4	4	3	
Methyl Cellosolve	4	4	2	3	3	4	
Methyl Chloride	4	4	3	4	4	4	
Methyl Cyclopentane	4	4	4	4	4	4	
Methylene Chloride	4	4	3	4	4	4	2
Methyl Ether (Dimethyl Ether) (Monomethyl Ether)	4	4	4	1	3	1	
Methyl Ethyl Ketone	4	4	1	4	3	4	1
Methyl Formate	4	4	2	4	2	---	
Methyl Isobutyl Ketone	4	4	2	4	4	4	
Methyl Methacrylate	4	4	3	4	4	4	



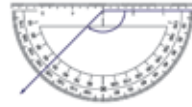
	NR	SBR	EPDM	NBR	CR	SI	TPR
Methyl Oleate	4	4	2	4	4	---	
Methyl Salicylate	3	3	2	4	4	---	
Milk	1	1	1	1	1	1	
Mineral Oil	4	4	3	1	2	2	1
Monochlorobenzene	4	4	4	4	4	4	
Monomethyl Aniline	4	4	2	4	4	---	
Monoethanol Amine	2	2	1	4	4	2	
Monomethyl Ether (Methyl Ether) (Dimethyl Ether)	4	4	4	1	3	1	
Monovinyl Acetylene	2	2	2	1	2	2	
Mustard Gas	1	2	1	---	1	1	
Naphtha	4	4	4	2	3	4	4
Naphthalene	4	4	4	4	4	4	1
Naphthalenic Acid	4	4	4	2	4	4	
Natural Gas	2	2	4	1	1	1	1
Neats Foot Oil	4	4	2	1	4	2	
Neville Acid	4	4	2	4	4	4	
Nickel Acetate (aq)	1	4	1	2	2	4	
Nickel Chloride (aq)	1	1	1	1	1	1	
Nickel Sulfate (aq)	2	2	1	1	1	1	
Niter Cake	1	1	1	1	1	1	
Nitric Acid (Conc.)	4	4	4	4	4	4	
Nitric Acid (Dilute)	4	4	2	4	2	2	
Nitric Acid/Red Fuming	4	4	4	4	4	4	
Nitrobenzene	4	4	1	4	4	4	1
Nitrobenzene (Petroleum Ether)	4	4	4	1	2	4	
Nitroethane	2	2	2	4	3	4	1
Nitrogen	1	1	1	1	1	1	
Nitrogen Tetroxide	4	4	3	4	4	4	
Nitromethane	2	2	2	4	2	4	
Octachlorotoluene	4	4	4	4	4	4	
Octadecane	4	4	4	1	2	4	
N-Octane	4	4	4	2	2	4	
Octyl Alcohol	2	2	3	2	1	2	
Oleic Acid	4	4	4	3	3	4	2
Oleum Spirits	4	4	4	2	3	4	
Olive Oil	4	4	2	1	2	3	
O-Dichlorobenzene	4	4	4	4	4	4	
Oxalic Acid	2	2	1	2	2	2	1
Oxygen-Cold	2	2	1	2	1	1	
Oxygen-(200-400 Degree Fahrenheit)	4	4	3	4	4	2	
Ozone	4	4	1	4	3	1	
Paint Thinner, Duco	4	4	4	4	4	4	
Palmitic Acid	2	2	2	1	2	4	2
Peanut Oil	4	4	3	1	3	1	
Perchloric Acid	4	4	2	4	2	4	
Perchloroethylene	4	4	4	2	4	4	4
Petroleum-Below 250 Degree Fahrenheit	4	4	4	1	2	2	
Petroleum-Above 250 Degree Fahrenheit	4	4	4	4	2	4	
Phenol (Carbolic Acid)	4	---	2	4	3	4	
Phenylbenzene (Biphenyl) (Diphenyl)	4	4	4	4	4	4	
Phenyl Ethyl Ether	4	4	4	4	4	4	
Phenyl Hydrazine	1	2	2	4	4	---	
Phorone (Diisopropylidene Acetone)	4	4	3	4	4	4	
Phosphoric Acid-20%	2	2	1	2	2	2	2
Phosphoric Acid-45%	3	3	1	4	2	3	
Phosphorus Trichloride	4	4	1	4	4	---	

	NR	SBR	EPDM	NBR	CR	SI	TPR
Pickling Solution	4	4	3	4	4	4	
Picric Acid	2	2	2	2	1	4	2
Pinene	4	4	4	2	3	4	
Pine Oil	4	4	4	4	4	4	
Piperidine	4	4	4	4	4	4	4
Plating Solution-Chrome	4	4	1	---	4	4	
Plating Solution-Others	4	4	1	1	4	4	
Polyvinyl Acetate Emulsion	2	4	1	---	2	---	
Potassium Acetate (aq)	1	4	1	2	2	4	
Potassium Chloride (aq)	1	1	1	1	1	1	
Potassium Cupro Cyanide (aq)	1	1	1	1	1	1	
Potassium Cyanide (aq)	1	1	1	1	1	1	
Potassium Dichromate (aq)	2	2	1	1	1	1	1
Potassium Hydroxide (aq)	2	2	1	2	2	3	1
Potassium Nitrate (aq)	1	1	1	1	1	1	
Potassium Sulfate (aq)	2	1	1	1	1	1	
Producer Gas	4	4	4	1	2	2	
Propane	4	4	4	1	2	4	
I-Propyl Acetate	4	4	2	4	4	4	
N-Propyl Acetate	4	4	2	4	4	4	
Propyl Acetone (Methyl Butyl Ketone)	4	4	1	4	4	3	
Propyl Alcohol	1	1	1	1	1	1	
Propyl Nitrate	4	4	2	4	4	4	
Propylene	4	4	4	4	4	4	
Propylene Oxide	4	4	2	4	4	4	
Pydraul, 10E, 29 ELT	4	4	1	4	4	4	
Pydraul, 30E, 50E, 53E, 90E	4	4	1	4	4	1	
Pydraul, 115E	4	4	1	4	4	4	
Pydraul, 230E, 312C, 540C	4	4	4	4	4	4	
Pyranol, Transformer Oil	4	4	4	1	2	4	
Pyridine	4	4	2	4	4	4	1
Pyroigneous Acid	4	4	2	4	2	---	
Pyrrrole	3	3	3	4	4	2	
Radiation	3	3	2	3	2	3	
Rapeseed Oil	4	4	1	2	2	4	
Red Oil (MIL-H-5606)	4	4	4	1	2	4	
RJ01 (MIL-F-2558 B)	4	4	4	1	2	4	
RP-1 (MIL-F-22576 C)	4	4	4	1	2	4	
Sal Ammoniac	1	1	1	1	1	2	
Salicylic Acid	1	2	1	2	1	---	
Salt Water	1	1	1	1	2	1	1
Sewage	2	2	2	1	2	2	
Silicate Esters	4	4	4	2	1	4	
Silicone Greases	1	1	1	1	1	3	1
Silicone Oils	1	1	1	1	1	3	
Silver Nitrate	1	1	1	2	1	1	
Skydrol 500	4	4	1	4	4	3	2
Skydrol 7000	4	4	1	4	4	3	
Soap Solutions	2	1	1	1	2	1	1
Soda Ash	1	1	1	1	1	1	
Sodium Acetate (aq)	1	4	1	2	2	4	2
Sodium Bicarbonate (aq) (Baking Soda)	1	1	1	1	1	1	
Sodium Bisulfite (aq)	1	2	1	1	1	1	
Sodium Borate (aq)	1	1	1	1	1	1	
Sodium Chloride (aq)	1	1	1	1	1	1	1
Sodium Cyanide (aq)	1	1	1	1	1	1	
Sodium Hydroxide (aq)	1	1	1	2	1	2	1
Sodium Hypochlorite (aq) (Chlorox)	4	4	2	2	1	2	1



	NR	SBR	EPDM	NBR	CR	SI	TPR
Sodium Metaphosphate (aq)	1	1	1	1	2	---	
Sodium Nitrate (aq)	2	1	1	2	2	4	
Sodium Perborate (aq)	2	2	1	2	2	2	
Sodium Peroxide (aq)	2	2	1	2	2	4	1
Sodium Phosphate	1	1	1	1	2	4	
Sodium Silicate (aq)	1	1	1	1	1	---	
Sodium Sulfate (aq)	2	2	1	1	1	1	
Sodium Thiosulfate (aq)	2	2	1	2	1	1	
Soybean Oil	4	4	3	1	2	1	4
Stannic Chloride (aq)	1	1	1	1	2	2	---
Stannous Chloride (aq)	1	1	1	1	1	2	
Steam Under 300 Degree Fahrenheit	4	4	1	4	3	3	
Steam Over 300 Degree Fahrenheit	4	4	3	4	4	4	
Stearic Acid	2	2	2	2	2	2	1
Stoddard Solvent	4	4	4	1	2	4	
Styrene	4	4	4	4	4	4	
Sucrose Solution	1	1	1	1	2	1	
Sulfite Liquors	2	2	2	2	2	4	
Sulfur	4	4	1	4	1	3	
Sulfur Chloride (aq)	4	4	4	3	3	3	
Sulfur Dioxide (Dry)	2	2	1	4	4	2	
Sulfur Dioxide (Wet)	4	4	1	4	2	2	
Sulfur Dioxide (Liaified Under Pressure)	4	4	1	4	4	2	
Sulfer Hexafluoride	4	4	1	2	1	2	
Sulfur Trioxide	2	2	2	4	4	2	2
Sulfuric Acid (Dilute)	3	3	2	3	2	4	1
Sulfuric Acid (Conc.)	4	4	3	4	4	4	
Sulfuric Acid (20% Oleum)	4	4	4	4	4	4	4
Sulfurous Acid	2	2	2	2	2	4	1
Tannic Acid	1	2	1	1	1	2	1
Tar, Bituminous	4	4	3	2	3	2	
Tartaric Acid	3	4	2	1	2	1	2
Terpineol	4	4	3	2	4	---	
Tertiary Butyl Alcohol	2	2	2	2	2	2	
Tertiary Butyl Catechol	4	2	2	4	2	---	
Teritary Butyl Mercaptan	4	4	4	4	4	4	
Tetrabromoethane	4	4	4	4	4	4	
Tetrabromomethane	4	4	4	4	4	4	
Tetrabutyl Tianate	2	2	1	2	2	---	
Tetrachloroethylene	4	4	4	4	4	4	4
Tetraethyl Lead	4	4	4	2	2	---	
Tetrahydrofuran	4	4	3	4	4	4	2
Tetralin	4	4	4	4	4	4	
Thionyl Chloride	4	4	3	4	4	---	
Titanium Tetrachloride	4	4	4	2	4	4	
Toluene	4	4	4	4	4	4	2
Toluene Diisocyanate	4	4	2	4	4	4	
Transformer Oil	4	4	4	1	2	2	
Transmiision Fluid Type A	4	4	4	1	2	2	
Triacetin	2	2	1	2	2	---	
Traryl Phosphate	4	4	1	4	4	3	
Tributoxy Ethyl Phosphate	2	2	1	4	4	---	
Tributyl Mercaptan	4	4	4	4	4	4	
Tributyl Phosphate	2	4	2	4	4	4	4
Trichlooacetic Acid	3	2	2	2	4	---	
Trichloroethane	4	4	4	4	4	4	
Trichloroethylene	4	4	4	4	4	4	4
Tricesyl Phosphate	4	1	4	4	3	3	1

	NR	SBR	EPDM	NBR	CR	SI	TPR
Triethanol Amine	2	2	1	2	1	---	1
Triethyl Aluminum	4	4	3	4	4	---	
Triethyl Borane	4	4	3	4	4	---	
Trinitrotoluene	4	4	4	4	2	---	
Triocetyl Phosphate	4	4	1	4	4	3	
Tung Oil (china Wood Oil)	4	4	3	1	2	4	
Turbine Oil	4	4	4	2	4	4	
Turpentine	4	4	4	1	4	4	3
Unsammtrical Dimethyl Hydrazine (UDMH)	1	1	1	2	2	4	
Varnish	4	4	4	2	4	4	4
Vegetable Oils	4	4	3	1	3	2	1
Versilube F-50	1	1	1	1	1	3	
Vinegar	2	2	1	2	2	1	
Vinyl Chloride	4	4	4	4	4	---	
Wagner 21B Brake Fluid	2	1	1	3	2	3	
Water	1	1	1	1	1	1	1
Whiskey, Wines	1	1	1	1	1	1	
White Pine Oil	4	4	4	2	4	4	
White Oil	4	4	4	1	2	4	
Wood Oil	4	4	4	1	2	4	
Xylene	4	4	4	4	4	4	3
Xyliidine (Di-methyl Aniline)	3	3	2	3	3	4	
Zeolites	1	1	1	1	1	---	
Zinc Acetate (aq)	1	4	1	2	2	4	
Zinc Chloride (aq)	1	1	1	1	1	1	1
Zinc Sulfate (aq)	2	2	1	1	1	1	
TT-T656b	4	4	1	4	4	4	
VV-B-680	3	1	1	2	2	4	
VV-G-632	4	4	4	1	1	3	
VV-G-671c	4	4	4	1	1	3	
VV-H-910	2	1	1	2	2	4	
VV-I-530a	4	4	4	1	2	3	
VV-K-211d	4	4	4	1	3	4	
VV-K-220a	4	4	4	1	2	4	
VV-L-751b	4	4	4	2	2	4	
VV-L-800	4	4	4	1	2	3	
VV-L-820b	4	4	4	1	2	3	
VV-L-825a Type I	4	4	4	1	1	3	
VV-L-825a Type II	4	4	4	1	1	3	
VV-L-825a Type III	4	4	4	2	2	4	
VV-O-526	4	4	4	1	1	3	
VV-P-216a	4	4	4	1	2	3	
VV-P-236	4	4	4	2	2	4	
51-F-23	4	4	4	1	2	3	
ASTM Method D-471							
1	4	4	4	1	1	3	
2	4	4	4	1	2	3	
3	4	4	4	1	2	3	
MIL-L-644 B	3	3	3	1	3	3	
MIL-L-2104 B	4	4	4	1	1	3	
MIL-L-2105 B	4	4	4	1	1	3	
MIL-G-2108	4	4	4	1	1	3	
MIL-S-3136 B Type I	4	4	4	1	2	4	
MIL-S-3136 B Type II	4	4	4	1	3	4	



# Rubber Cal™

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ENGINEERED ELASTOMERS

& WEAR PARTS →

	NR	SBR	EPDM	NBR	CR	SI	TPR
MIL-S-3136 B Type III	4	4	4	1	3	4	
MIL-S-3136 B Type IV	4	4	4	1	1	3	
MIL-S-3136 B Type V	4	4	4	1	2	3	
MIL-S-3136 B Type VI	4	4	4	1	2	3	
MIL-S-3136 B Type VII	4	4	4	1	3	4	
MIL-L-3150 A	4	4	4	1	1	3	
MIL-L-3503	4	4	4	1	2	3	
MIL-L3545-B	4	4	4	2	2	4	
MIL-C-4339 C	4	4	4	1	1	3	
MIL-G-4343 B	4	4	3	2	2	4	
MIL-L-5020 A	4	4	4	1	1	4	
MIL-J-5161 F	4	4	4	1	3	4	
MIL-C-5545 A	4	4	4	2	2	4	
MIL-H-5559 A	2	1	1	1	2	2	
MIL-F-5566	1	1	1	1	2	1	
MIL-F-5602	4	4	4	1	2	3	
MIL-H-5606 B (Red Oil)	4	4	4	1	2	4	
MIL-J-5624 G JP-3, JP-4, JP-5	4	4	4	1	3	4	
MIL-O-6081 C	4	4	4	1	2	3	
MIL-L-6082 C	4	4	4	1	1	3	
MIL-H-6083 C	4	4	4	1	2	3	
MIL-L-6085 A	4	4	4	2	3	3	
MIL-L-6086 B	4	4	4	1	1	3	
MIL-L-6387 A	4	4	4	1	3	3	
MIL-C-6529 C	4	4	4	2	2	4	
MIL-F-7024 A	4	4	4	1	2	4	
MIL-H-7083 A	2	1	1	1	2	2	
MIL-G-7118 A	4	4	4	1	3	3	
MIL-G-7187	4	4	4	1	1	3	
MIL-G-7421 A	4	4	4	1	3	3	
MIL-H-7644	2	1	1	2	2	4	
MIL-L-7645	4	4	4	2	2	4	
MIL-G-7711 A	4	4	4	1	1	3	
MIL-L7808 F	4	4	4	1	3	3	
MIL-L-7870 A	4	4	4	1	2	3	
MIL-C-8188 C	4	4	4	1	3	3	
MIL-A-8243 B	2	1	1	1	2	2	
MIL-L-8383 B	4	4	4	1	1	3	
MIL-H-8446 (MLO-8515)	4	4	4	2	2	4	
MIL-1-8660 B	1	1	1	1	1	4	
MIL-L-900 F	4	4	4	1	2	4	
MIL-T-9188 B	4	4	1	4	4	4	
MIL-L-9236 B	3	3	3	1	3	4	
MIL-L-10295 A	4	4	4	1	2	3	
MIL-L-10324 A	4	4	4	1	2	3	
MIL-G-10924 B	4	4	4	1	2	3	
MIL-L-11734 B	4	4	4	1	3	3	
MIL-O-11773	4	4	4	1	3	3	
MIL-P-12098	2	1	1	2	2	4	
MIL-H-13862	4	4	4	1	2	3	
MIL-H-13866 A	4	4	4	1	2	3	
MIL-H-13910 B	2	1	1	2	2	4	
MIL-H-13919 A	4	4	4	1	2	3	
MIL-L-14107 B	4	4	4	3	1	4	
MIL-L-15017	4	4	4	1	1	3	
MIL-L-15018 B	4	4	4	1	1	3	
MIL-L-15019 C	4	4	4	1	1	3	
MIL-L-15719 A	3	2	2	2	2	4	
MIL-G-15793	4	4	4	1	3	3	

	NR	SBR	EPDM	NBR	CR	SI	TPR
MIL-F-16929 A	4	4	4	1	3	3	
MIL-F-16958 A	4	4	4	1	2	3	
MIL-F-17111	4	4	4	1	2	3	
MIL-L-17331 D	4	4	4	1	1	3	
MIL-L-17353 A	4	4	4	1	3	3	2
MIL-L-17672 B	4	4	4	1	1	3	
MIL-L-18486 A	4	4	4	1	1	3	
MIL-G-18709 A	4	4	4	1	1	3	
MIL-H-19457 B	4	4	1	4	4	4	2
MIL-F-19605	4	4	4	1	3	4	
MIL-L-19701	4	4	4	1	3	3	4
MIL-L-21260	4	4	4	1	1	3	
MIL-L-21568 A	2	1	1	1	1	4	
MIL-H-22072	2	1	1	1	2	2	
MIL-L-22396	4	4	4	1	1	3	
MIL-L-23699 A	4	4	4	1	3	3	
MIL-G-23827 A	4	4	4	1	3	3	
MIL-G-25013 D	2	1	1	1	2	4	
MIL-F-25172	4	4	4	1	3	4	
MIL-L-25336 B	4	4	4	1	3	3	1
MIL-F-25524 A	4	4	4	1	3	4	
MIL-G-25537 A	4	4	4	1	2	3	
MIL-F-2558 B (RJ-1)	4	4	4	1	2	3	
MIL-F-25576 C (RP-1)	4	4	4	1	3	4	
MIL-H-25598	4	4	4	1	2	3	
MIL-F-25656 B	4	4	4	1	3	4	
MIL-L-25681 C	2	1	1	1	2	4	
MIL-G-25760 A	3	3	4	1	3	4	
MIL-L-25968	4	4	4	1	3	3	
MIL-L-26081 A	4	4	4	1	1	3	
MIL-G-27343	1	1	1	1	1	4	
MIL-H-27601 A	4	4	4	2	2	4	
MIL-G-27617	---	2	1	4	---	4	
MIL-I-27686 D	2	1	1	1	2	2	
MIL-L-27694 A	1	1	1	1	1	4	
MIL-L-46000 A	4	4	4	1	3	pi	
MIL-H-46001 A	4	4	4	1	1	3	
MIL-L-46002	4	4	4	1	1	3	1
MIL-H-46004	4	4	4	1	2	3	
MIL-P-46046 A	2	1	1	2	2	4	
MIL-H-81019 B	4	4	4	1	2	3	
MIL-S-81807	1	1	1	1	1	4	
O-A-548 B	2	1	1	1	2	2	
O-T-634 B	4	4	4	3	4	4	
P-S-661 B	4	4	4	1	3	4	
P-D-680	4	4	4	1	3	4	
TT-N-95 A	4	4	4	1	3	4	
TT-N-97 B	4	4	4	1	3	4	1
TT-I-735 B	1	1	1	1	2	1	
TT-S-735 Type I	4	4	4	1	2	4	
TT-S-735 Type II	4	4	4	1	3	4	1
TT-S-735 Type III	4	4	4	1	3	4	
TT-S-735 Type IV	4	4	4	1	1	3	
TT-S-735 Type V	4	4	4	1	2	3	2
TT-S-735 Type VI	4	4	4	1	2	3	
TT-S-735 Type VII	4	4	4	1	3	4	1