

Polymer Selection Guide Chart



Base Polymer - Common Name		Natural Rubber	Synthetic Rubber	Neoprene	Nitrile (High)	Nitrile (Med.High)	SBR	Butyl	Urethane	Hypalon	EPDM	Fluorocarbon	Silicone			
Chemical Name		Polyisoprene	Synthetic Polyisoprene	Chloroprene	Butadiene Acrylonitrile	Butadiene Acrylonitrile	Styrene Butadiene	Isobutylene Isoprene	Polyester / Polyether	Chlorosulfonated Polyethylene	Ethylene Propylene	Fluorinated Hydrocarbon	Polysiloxane			
ASTM D-2000 Classification		AA	AA	BC, BE	BF, BG, BK	BF, BG	AA, BA	AA, BA	BG	CE	CA	HK	FC, FE, GE			
Coefficient of Thermal Expansion - 10-5 Per F (Gum)		37	37	34	39	39	37	32	27	27	32	88	45			
Weight of Base Polymer	lb/in3	0.033	0.033	0.045	0.036	0.036	0.034	0.033	0.045	0.043	0.031	0.067	0.040			
	Specific Gravity	0.92	0.91	1.25	1.00	1.00	0.94	0.92	1.25	1.18	0.86	1.86	1.1 - 1.6			
Original Physical Properties @ 70 F	Durometer Range, Shore A		20 - 100	30 - 90	20 - 95	20 - 95	20 - 95	30 - 100	40 - 90	35 - 100	45 - 100	30 - 90	55 - 90	25 - 90		
	Tensile Strength, PSI		3500	3500	3000	3000	3000	3000	3000	6000	3000	2500	2000	1500		
	Elongation, %		700	650	600	600	600	600	850	750	500	600	300	700		
	Compression Set		A	A	B	B	B	B	C-B	D	C-B	B-A	B-A	B-A		
	Resilience		A	A	A	B	B	B	C	C-A	C	B	C	D-A		
	Permeability Coef.-Nitrogen, 10-8 cm2 sec-1 atm-1		6.12	6.12	0.89	0.18	0.31	4.8	0.25	0.95 / 16	0.7 TO 0.9	6.4	0.2	200		
	Electrical Resistivity (Polymer)		A	A	C	D-C	D-C	A	A	B	B	A	B	A		
	Creep, Drift, or Strain Relaxation		A	B	B	B	B	A	C	C-A	C	C-B	B	C-A		
	Mechanical Properties		Impact Strength		A	A	B	C	C	A	B	B-A	B	B	D-C	
			Abrasion Resistance		A	B	A	A	A	A	A	A	B	B	C-B	
		Tear Resistance		A	A	B	B	C	B	A	B	C	B	C-B		
		Cut Growth		A	A	B	B	B	A	A	B	B	B	C-B		
Overall Properties	Temperature Data	(Hot) Tensile Strength, %		212 F	-32	-44	-50	-50	-55	-44	-57	-56	-57	-49	-72	-12
		Decrease		350 F	-84	NA	-74	-75	-76	-72	-87	-83	-82	-78	-87	-41
		(Hot) Elongation, %		212 F	+17	+6	-35	-30	-25	-10	-32	-49	-21	-33	-29	
		Decrease		350 F	-33	NA	-45	-57	-60	-47	-32	-54	-69	-48	-48	
		Strain Relaxation at 212 F			B	B	B	B	B	C	D	C	C-B	B-A	A	
		Heat Aging at 212 F			B-C	B-C	B-A	B	B	B	B	B-A	A	A	A	
		Flame Resistance			D	D	B-A	D-C	D	D	D	B-A	D	A	A	
		Low Temperature			-20 T -50	-20 TO -50	+10 TO -50	+30 TO -20	0 TO -40	0 TO -50	-10 TO -40	-10 TO -30	-30 TO -50	-20 TO -50	+10 TO -10	-60 TO -180
					Stiffening - F	-80	-80	-85	-40	-85	-80	-80	-70	-90	-60	-90 TO -180
					Brittle Point - F											
Overall Properties	Environmental	Weather - Sunlight Aging		D	NR	B	D	D	D	A	A	A	A			
		Oxidation		B	B	A	B	B	C	A	B	A	A	A		
		Ozone Cracking		NR	NR	A	C	C	NR	A	A	A	A	A		
		Radiation		B	C-B	B	B	B	B	B	B	B	C-B	C-B		
		Water		A	A	B	A	B	B-A	A	C-B	B	A	A		
		Steam		B	B	B	C-B	C-B	C	B-A	D	B	A	B	C-B	
		Alkali Dilute / Concentrated		A/C-B	C-B/C-B	A/A	B/B	B/B	C-B/C-B	A/A	C/D	A/A	A/A	A	A/A	
		Acid Dilute / Concentrated		A/C-B	C-B/C-B	A/A	B/B	B/B	C-B/C-B	A/A	C/D	A/A	A/A	B/C	B/C	
		Ketones, Oxygenated Solvents		B	B	C	D	D	B	A	D	B	B-A	NR	B-C	
		Chlorinated Hydrocarbons, Degreasers		NR	NR	D	C-B	C	NR	NR	C-B	D	NR	A	NR	
Overall Properties	General	Aliphatic Hydrocarbons, Kerosene, etc.		NR	NR	C	A	A	NR	NR	B	C	NR	D-C		
		Aromatic Hydrocarbons, Benzol, Toluol, etc.		NR	NR	B	B-A	B	NR	NR	C	B	NR	A	NR	
		LP Gases, Fuel Oils		NR	NR	B	A	A	NR	NR	C-B	B	NR	A	C	
		Alcohols		B-A	B	A	C-B	C-B	B	B-A	B	A	B-A	C-A	C-B	
		Brake Fluids, Non-Petroleum Base		B-A	B	C	NR	NR	B-A	B	NR	C	B-A	C	A	
		Synthetic Lubricants - Diester		NR	NR	D	B-A	D	NR	NR	D	D	NR	A	NR	
		Animal and Vegetable Oils		D-B	D-B	B	B	B	D-B	B-A	A	B	B	A	A	
		Hydraulic Fluids		Petroleum Base		NR	NR	D-C	B-A	C-B	NR	NR	B	C-B	NR	NR
				Water Glycol		B-A	B-A	B	C	B	B	B-A	C-B	B	A	A
				Silicate Ester		B-A	B-A	B	B	B	B-A	B-A	NR	B	B-A	NR
Overall Properties	Lubricating Oils	Phosphate Ester		B	B	C	D	D	B	A	NR	C	A (to 300F)	B-A	B	
		High Aniline (190 +)		NR	NR	B	B	A	NR	NR	A	A	NR	A	C	
		Low Aniline Point		NR	NR	A	A	A	NR	NR	B	B	NR	A	B	
Overall Properties	Refrigerants	Ammonia		B	B	A	B	B	B	D	B	B	NR	A		
		Fluorinated		R-12, 13, 22	R-12, 13, 22	R-11,12,13,21,22	R-11, 12, 13	R-11, 12, 13	R-12, 13, 22	R-12, 13, 22	R-12	R-11, 12, 13, 22	R-12, 13, 22	R-11, 12, 13	NR	
		Methyl Chloride		D	D	NR	NR	NR	D	C	NR	NR	D	B	NR	
Overall Properties	Refrigerants + Oil	Fluorinated		NR	NR	R-11, 12, 22	R-11, 12	R-11, 22	NR	NR	R-12, -13/NR	R-11, 12, 22	NR	R-11, 12	NR	
		Taste		C-B	C-B	C-B	C-B	C-B	C-B	C-B	B	B	C-B	B	B	
Odor		B-A	B	C-B	B	B	B	B	B	B	B	B	B			
Non-Staining		A	A	B-A	D-C	C-B	D-B	B	B	A	B	C-B	A			
Bonding to Rigid Materials		A	A	B-A	B-A	B-A	A	C-A	C-B	A	C-B	C-B	B-A			

A = Excellent B = Good C = Fair D = Use with caution NR = Not recommended