

Common Polymers

- EPDM- used with high pH aqueous solutions
- Buna-N- good solvent oil and water resistance
- SBR- low cost, water resistant material for moderate chemical products
- Urethane- for castable type needs and high wearable needs



EPDM Polymer

Ethylene Propylene is a polymer with outstanding properties. It has exceptionally good weather aging and ozone resistance, excellent water and chemical resistance, excellent resistance to gas permeability, excellent resistance to aging due to exposure to steam, and heat resistance excellent up to 350° F. Ethylene Propylene is a polymer where oil and solvent resistance is poor, however it is fairly good in ketones and alcohols.

Ethylene Propylene is not recommended for food applications or exposure to aromatic hydrocarbons.

Common Names

ASTM D-2000 Classification	EPR, EPT
Military (MIL STD 417)	CA
Chemical Definition	RS
	Ethylene Propylene

General Characteristics

Durometer Range (Shore A)	30 - 90	Tear Resistance	Fair
Tensile Range (P.S.I.)	500 - 3000	Solvent Resistance	Poor
Elongation (Max %)	600	Oil Resistance	Poor
Compression Set	Good	Low Temp. Usage (F°)	-20° to -60°
Resistance - Rebound	Good	High Temp. Usage (F°)	to 350°
Abrasion Resistance	Good	Aging Weather - Sunlight	Excellent
		Adhesion to Metals	Fair to Good



Buna-N Polymer

Buna-N is a general purpose oil resistant polymer which has a good solvent, oil, water and hydraulic fluid resistance, good compression set, abrasion resistance and tensile strength.

Buna-N should not be used in highly polar solvents such as acetone and MEK, ozone, chlorinated hydrocarbons and nitro hydrocarbons.

Common Names

ASTM D-2000 Classification	Buna-N, Nitrile, NBR
Military (MIL STD 417)	BF, BG, BK
Chemical Definition	SB
	Butadiene Acrylonitrile

General Characteristics

Durometer Range (Shore A)	20 - 95	Tear Resistance	Good
Tensile Range (P.S.I.)	200 - 3000	Solvent Resistance	Good/Excel.
Elongation (Max %)	600	Oil Resistance	Good/Excel.
Compression Set	Good	Low Temp. Usage (F°)	+30° to -40°
Resistance - Rebound	Good	High Temp. Usage (F°)	to 250°
Abrasion Resistance	Excellent	Aging Weather - Sunlight	Poor
		Adhesion to Metals	Good/Excel.



SBR Polymer

SBR is a low cost non-oil resistant material. It has a good water resistance and resilience up to 70 durometer, compression set becomes poorer with higher durometer, generally satisfactory for most moderate chemicals and wet or dry organic acids.

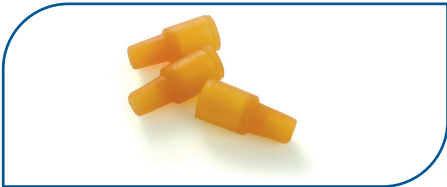
SBR is not recommended for ozone, strong acids, oils, greases, fats and most hydrocarbons.

Common Names

ASTM D-2000 Classification	SBR, GRS
Military (MIL STD 417)	AA, BA
Chemical Definition	RS
	Styrene Butadiene

General Characteristics

Durometer Range (Shore A)	30 - 100	Tear Resistance	Fair
Tensile Range (P.S.I.)	500 - 3000	Solvent Resistance	Poor
Elongation (Max %)	600	Oil Resistance	Poor
Compression Set	Good	Low Temp. Usage (F°)	0° to -50°
Resistance - Rebound	Good	High Temp. Usage (F°)	to 225°
Abrasion Resistance	Excellent	Aging Weather - Sunlight	Poor
		Adhesion to Metals	Excellent



Urethane Polymer

The castable types have excellent abrasion resistance, good compression set at high hardness levels: low friction surface, tensile strengths up to 6000 PSI: good ozone, oil and solvent resistance. Poor heat and hot water resistance. Wear resistance is excellent and greatly superior to most other polymers.

Urethane is not normally attacked by moderate chemicals and hydrocarbons. It is generally attacked by concentrated acids, ketones, chlorinated and nitro hydrocarbons.

Common Names

ASTM D-2000 Classification	Urethane, Polyurethane
Military (MIL STD 417)	BG
Chemical Definition	SB
	Polyester/ Polyether

General Characteristics

Durometer Range (Shore A)	35 - 100	Tear Resistance	Excellent
Tensile Range (P.S.I.)	500 - 6000	Solvent Resistance	Poor
Elongation (Max %)	750	Oil Resistance	Good
Compression Set	Poor	Low Temp. Usage (F°)	-10° to -30°
Resistance - Rebound	Good	High Temp. Usage (F°)	to 175°
Abrasion Resistance	Excellent	Aging Weather - Sunlight	Excellent
		Adhesion to Metals	Fair to Good

Common Polymers

- Butyl- for liquid, lyophilized or dry products
- Neoprene- oil or glycol based products
- Natural Rubber- for aqueous solutions
- Silicone- resists high heat or multiple steam sterilization



Butyl Rubber

Butyl rubber is impermeable to most common gases and has good resistance to sunlight and ozone. Butyl is normally satisfactory when exposed to animal and vegetable oils and oxidizing chemicals. Butyl is not recommended for use with petroleum solvent, coal tar and aromatic hydrocarbons.

Common Names		General Characteristics		Tear Resistance	Good
Butyl		Durometer Range (Shore A)	40 - 90	Solvent Resistance	Poor
ASTM D-2000 Classification	AA, BA	Tensile Range (P.S.I.)	500 - 3000	Oil Resistance	Poor
Military (MIL STD 417)	RS	Elongation (Max %)	850	Low Temp. Usage (F°)	-10° to -60°
Chemical Definition	Isobutylene Isoprene	Compression Set	Fair to Good	High Temp. Usage (F°)	to 250°
		Resistance - Rebound	Fair	Aging Weather - Sunlight	Excellent
		Abrasion Resistance	Fair	Adhesion to Metals	Good



Neoprene Rubber

Neoprene is an all purpose polymer with many desirable characteristics. It has additional features: high resilience with low compression set; flame resistant; compounds free of sulfur are easily made; and animal and vegetable oil resistant. Generally not affected by moderate chemicals, fats, greases and many oils and solvents. Generally attacked by strong oxidizing acids, esters, ketones, chlorinated aromatic and nitro hydrocarbons.

Common Names		General Characteristics		Tear Resistance	Good
Neoprene®		Durometer Range (Shore A)	20 - 95	Solvent Resistance	Fair
ASTM D-2000 Classification	BC, BE	Tensile Range (P.S.I.)	500 - 3000	Oil Resistance	Fair
Military (MIL STD 417)	SC	Elongation (Max %)	600	Low Temp. Usage (F°)	+10° to -50°
Chemical Definition	Polychloroprene	Compression Set	Good	High Temp. Usage (F°)	to 250°
		Resistance - Rebound	Excellent	Aging Weather - Sunlight	Good
		Abrasion Resistance	Excellent	Adhesion to Metals	Good/Excell.



Natural Rubber

Natural Rubber has many good characteristics. It has high resilience, good compression set, good roll building behavior, and molding properties; very good friction surface, but not a fine smooth surface when ground; high tear strength, low crack growth, usable for ketones and alcohol, and good low temperature properties.

Natural Rubber is not recommended for oil and solvent resistance and ozone attacks it.

Common Names		General Characteristics		Tear Resistance	Excellent
Natural Rubber		Durometer Range (Shore A)	20 - 100	Solvent Resistance	Poor
ASTM D-2000 Classification	AA	Tensile Range (P.S.I.)	500 - 3500	Oil Resistance	Poor
Military (MIL STD 417)	RN	Elongation (Max %)	700	Low Temp. Usage (F°)	-20° to -60°
Chemical Definition	Polysoprene	Compression Set	Excellent	High Temp. Usage (F°)	to 175°
		Resistance - Rebound	Excellent	Aging Weather - Sunlight	Poor
		Abrasion Resistance	Excellent	Adhesion to Metals	Excellent



Silicone Rubber

Silicone Rubber has a great many variations and can be compounded to meet any number of applications. Silicone can be compounded to have tensile in the area of 1500 PSI and tear up to 200 lbs.; low compression set and good resilience, moderate solvent resistance, excellent heat resistance and good release characteristics; extreme low temperature properties; and can be highly resistant to oxidation and ozone attack.

Generally attacked by most concentrated solvents, oils, concentrated acids and dilute sodium hydroxide.

Common Names		General Characteristics		Tear Resistance	Poor
Silicone		Durometer Range (Shore A)	30 - 90	Solvent Resistance	Poor
ASTM D-2000 Classification	FC, FE, GE	Tensile Range (P.S.I.)	200 - 1500	Oil Resistance	Fair to Poor
Military (MIL STD 417)	TA	Elongation (Max %)	700	Low Temp. Usage (F°)	-60° to -150°
Chemical Definition	Polysiloxane	Compression Set	Good	High Temp. Usage (F°)	to 450°
		Resistance - Rebound	Good	Aging Weather - Sunlight	Excellent
		Abrasion Resistance	Fair to Poor	Adhesion to Metals	Good