ACCURATE FELT & GASKET MFG. CO., INC.
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Rubber Types and General Characteristics

	Buna-N	Neoprene	EPR	Silicone	Hydrin	Hypalon
Common Names	**Buna-N, Nitrile, NBR**	**Neoprene®**	**EPR, EPT, EPDM**	**Silicone**	**Hydrin**	**Hypalon**
ASTM D-2000 Classification	BF, BG, BK	BC, BE	CA	FC, FE, GE	CH, DK, DJ	CE
Military (MIL STD 417)	SB	SC	RS	TA	SB	SC
Chemical Definition	Butadiene Acrylonitrile	Polychloroprene	Ethylene Propylene	Polysiloxane	Epichlorohydrin	Chlorosulfonated/polyethylene
General Characteristics						
Durometer Range (Shore A)	20 - 95	20 - 95	30 - 90	30 -90	40 - 90	45 - 100
Tensile Range (P.S.I.)	200 - 3000	500 - 3000	500 -3000	200 - 1500	500 - 2500	1000 - 3000
Elongation (Max %)	600	600	600	700	350	500
Compression Set	Good	Good	Good	Good	Good	Fair
Resilience - Rebound	Good	Excellent	Good	Good	Good	Fair
Abrasion Resistance	Excellent	Excellent	Good	Fair to Poor	Good	Excellent
Tear Resistance	Good	Good	Fair	Poor	Good	Good
Solvent Resistance	Good to Excellent	Fair	Poor	Poor	Good	Fair to Good
Oil Resistance	Good to Excellent	Fair	Poor	Fair to Poor	Excellent	Fair to Good
Low Temperature Usage (F°)	+30° to -40°	+10° to -50°	-20° to -60°	-60° to -150°	-15° to -50°	-30° to -60°
High Temperature Usage	to 250°	to 250°	to 350°	to 450°	to 225°	to 225°
Aging Weather - Sunlight	Poor	Good	Excellent	Excellent	Good	Excellent
Adhesion to Metals	Good to Excellent	Good to Excellent	Fair to Good	Good	Good	Excellent
Comment	Nitrile (Buna-N) is a general purpose oil resistant polymer which has good solvent, oil, water and hydraulic fluid resistance, good compression set, abrasion resistance and tensile strength.	Neoprene is an all purpose polymer with many desirable characteristics. It has additional plus 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.	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 and 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.	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 upto 200 lbs.; low compression set and good resilience; moderate solvent resistance; excellent heat resistance; good release characteristics; extreme low temperature properties; and can be highly resistant to oxidation and ozone attack	Epichlorohydrin is an outstanding polymer, exhibiting most of the better qualities of nitrile and neoprene, but having additional plus features: oil and solvent resistance is very good. Hydrin has especially low swell in gasoline; low temperature performance is better than either nitrile or neoprene, and offers less torsional stiffness at sub zero temperatures; high temperature endurance is good up to 250°F; resilience is good and compression set is fairly good in many compounds; abrasion is equivalent to the nitriles; and ozone weathering and water resistance are very good.	Hypalon has very good resistance to oxidation and ozone, as well as good flame resistance; it is similar to neoprene except with improved acid resistance; abrasion resistance is excellent, about the equivalent of nitrile, low friction surface; and oil and solvent resistance about intermediate between neoprene and nitrile.
	Nitrile should not be used in highly polar solvents such as acetone and MEK, ozone, chlorinated hydrocarbons and nitro hydrocarbons.	Neoprene is generally attacked by strong oxidizing acids, esters, ketones, chlorinated aromatic and nitro hydrocarbons.	Ethylene Propylene is not recommended for food applications or exposure to aromatic hydrcarbons.	Silicone is generally attacked by most concentrated solvents, oils, concentrated acids and dilute sodium hyrdoxide..	Epichlorohydrin is generally attacked by ketones, esters, aldehydes, chlorinated and nitro hydrocarbons.	Hypalon is not recommended for exposure to concentrated oxidizing acids, esters, ketones, chlorinated, aromatic and nitro hydrocarbons. Hypalon is recommended for immersion in water.

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Rubber Types and General Characteristics

	Natural Rubber	SBR	Fluorosilicone	Fluoro Elastomers	Urethane	Butyl
Common Names	**Natural Rubber**	**SBR, GRS**	**Fluorosilicone**	**Fluoro Elastomers**	**Urethane, Polyurethane**	**Butyl**
ASTM D-2000 Classification	AA	AA, BA	FK	HK	BG	AA, BA
Military (MIL STD 417)	RN	RS	MIL-R-25988, Ammend. 2	MIL-R-25897 and MIL-R-83248	SB	RS
Chemical Definition	Polyisoprene	Styrene Butadiene	Fluorosilicone	Fluorinated Hydrocarbon	Polyester/Polyether Urethane	Isobutylene Isoprene
General Characteristics						
Durometer Range (Shore A)	20 - 100	30 - 100	50 - 80	60 - 90	35 - 100	40 - 90
Tensile Range (P.S.I.)	500 - 3500	500 - 3000	500 - 800	500 - 2000	500 - 6000	500 - 3000
Elongation (Max %)	700	600	300	300	750	850
Compression Set	Excellent	Good	Good	Good	Poor	Fair to Good
Resilience - Rebound	Excellent	Good	Excellent	Fair	Good	Fair
Abrasion Resistance	Excellent	Excellent	Poor	Good	Excellent	Fair
Tear Resistance	Excellent	Fair	Poor	Good	Excellent	Good
Solvent Resistance	Poor	Poor	Fair	Excellent	Poor	Poor
Oil Resistance	Poor	Poor	Good	Excellent	Good	Poor
Low Temperature Usage (F°)	-20° to -60°	0° to -50°	-80°	+10° to -10°	-10° to -30°	-10° to -60°
High Temperature Usage (F°)	to 175°	to 225°	300°	400° to 600° depending on time and service condition	to 175°	to 250°
Aging Weather - Sunlight	Poor	Poor	Excellent	Excellent	Excellent	Excellent
Adhesion to Metals	Excellent	Excellent	Poor	Good	Fair to Good	Good
Comment	Natural Rubber has many good characteristics. It has high resilience, good compression set, food 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.	SBR is a low cost non-oil resistant material. It has 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.	Fluorosilicone is considerably more expensive than silicone, however it is developed for special applications where general resistance to oxidizing chemical, aromatic and chlorinated solvent bases is required.	Fluoro Elastomers have high heat resistance up to 600°F, and resistance to a wide reange of oils and solvents; especially all aliphatic, aromatic and halogenated hydrocarbons, acids, animal and vegetable oils.	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 resistance; good oil and solvent resistance; and poor heat and hot water resistance. The millable types of Polyurethane are in wide use today. Through the use of reinforcing pigments and other chemicals, desirable characteristics can be obtained to fit a variety of applications: wear resistance is excellent and greatly superior to most other polymers; the surface is of low friction nature; oil resistance is good and equivalent to the better nitriles but is not recommended for use in water or heat above 175°F; plus good ozone resistance and low rebound characteristcs.	Butyl rubber is impermeable to most common gasses and has good resistance to sunlight and ozone. Butyl is normally satisfactory when exposed to animal and vegetable oils and oxidizing chemicals.
	Natural Rubber is not recommended for oil and solvent resistance and ozone attacks it.	SBR is not recommended for ozone, strong acids, oils, greases, fats and most hydrocarbons.	Fluorosilicone is not recommended and is generally attacked when exposed to brake fluids, hydrazine and ketones. Fluorosilicone should not be confused with silicone in regard to high heat resistance.	Fluoro Elastomers are not recommended for ketones, low molecular weight esters and nitro containing compounds.	Urethane is not normally attacked by moderate chemicals and hydrocarbons. It is generally attacked by concentrated acids, ketones, chlorinated and nitro hydrocarbons	Butyl is not recommended for use with petroleum solvent, coal tar and aromatic hydrocarbons.

The above materials can be fabricated by: die-cutting, stripping, laminating, and shaping. The information on this sheet are obtained by ASTM D-2000 We believe the information to be accurate, relevant and reliable. Please look upon these as guides rather than absolutes. Since actual service conditions for a given application may vary substantially from standard laboratory conditions, specific recommendations or warranties relative to a specific end use cannot be made. The buyer is urged to conduct its own investigations and qualification tests to determine suitability for its intended application. Accurate Felt & Gasket Mfg. Co. shall not be liable for any damages arising out of the use of any of its guide specifications.