

ENGINEERING GUIDE TO RUBBER COMPOUNDS

Polymer Type	Natural Rubber	Buna N, Nitrile	Highly Saturated Nitrile	Neoprene	SBR	EPR/EPDM	Butyl	Polybutadiene	Urethane	Silicone	Fluorosilicone	Viton, Fluorel	Acrylic	Vamac	Hypalon	Hydrin
Polymer Name	Polysoprene	Acrylonitrile Butadiene	Hydrogenated Nitrile	Polychloroprene	Styrene Butadiene	Ethylene Propylene	Isobutylene-isoprene	Polybutadiene	Polyurethane	Polysiloxane	Fluorinated polysiloxane	Fluoroelastomer	Polyacrylate	Ethylene Acrylic	Chlorosulfonated polyethylene	Epichlorohydrin
ASTM D-2000 Classification	AA	BG, BF, BK	DH	BC	AA	BA, CA, DA	AA	AA	BG	GE	FK	HK	DF, DH, EH	EE	CE	DK, DJ
ASTM Designation	NR	NBR	HNBR	CR	SBR	EPDM	IIR	BR	AU	MQ	FMQ	FKM	ACM	AEM	CSM	ECO
Durometer	30-90	40-95	45-90	30-85	40-90	30-90	40-75	40-80	20-100	25-80	40-80	45-90	50-90	40-90	55-95	40-90
Tensile Strength	XInt	Good	Good	Good	Good	Good	Fair	Fair	XInt	Fair	Poor	Fair	Fair	Good	Good	Fair
Elongation	XInt	Good	Good	XInt	Good	Good	Fair	Good	XInt	Fair	Fair	Good	Fair	Good	Fair	Good
Tear Resistance	Good	Fair	Good	Good	Fair	Good	Good	Good	XInt	Poor	Poor	Fair	Fair	Good	XInt	XInt
Abrasion Resistance	XInt	Good	Good	XInt	Good	Good	Good	XInt	XInt	Poor	Poor	Fair	Good	Good	XInt	Good
Compression Set Resistance	Good	XInt	Good	Fair	Fair	Fair	Fair	Good	XInt	Good	Fair	Good	Fair	Good	Good	Fair
Resilience	XInt	Good	Good	Good	Good	Good	Poor	XInt	Good	XInt	Fair	Fair	Fair	Poor	Fair	Good
Heat Aging	Good	XInt	XInt	Very Good	Good	XInt	XInt	Fair	XInt	XInt	XInt	XInt	XInt	XInt	Good	Good
Sunlight Resistance	Poor	Good	Good	Good	Poor	XInt	Good	Fair	XInt	XInt	XInt	XInt	XInt	Good	XInt	Good
Ozone Resistance	Poor	Fair	Good	Good	Poor	XInt	Good	Fair	Good	XInt	XInt	XInt	Good	Good	XInt	XInt
Lubricating Oil Resistance	Poor	XInt	XInt	Good	Poor	Poor	Good	Poor	Good	Fair	XInt	Good	XInt	Good	Good	XInt
Aromatic Oil Resistance	Poor	Good	XInt	Fair	Poor	Poor	Poor	Poor	Good	Poor	Good	Good	Good	Good	Poor	Good
Animal/Vegetable Oil Resistance	Fair	Good	XInt	XInt	Fair	Poor	XInt	Poor	Fair	Good	Good	Good	Good	Good	Good	Good
Acid Resistance	Good	Good	Good	Good	Fair	XInt	XInt	Fair	Poor	Good	Good	Good	Fair	Fair	Good	Poor
Alkali Resistance	Fair	Good	Good	Good	Fair	XInt	XInt	Fair	Poor	XInt	Good	Good	Poor	Fair	XInt	Fair
Flame Resistance	Poor	Poor	Poor	Good	Poor	Poor	Poor	Poor	Poor	Fair	Fair	Good	Poor	Poor	XInt	Poor
Dielectric Strength	XInt	Poor	Good	Fair	XInt	Good	Good	Fair	Fair	Good	Good	Good	Fair	Fair	Good	Good
Freedom From Odor	XInt	Fair	Fair	Good	Fair	Good	Good	Fair	Fair	Good	Good	Fair	Fair	Fair	XInt	Fair
Maximum Temperature (F)	210	260	325	260	215	300	250	250	250	550	450	500	375	325	250	325
Minimum Temperature (F)	-45	-40	-45	-50	-50	-50	-50	-65	-40	-150	-81	-40	-20	-10	-35	-55

NATURAL RUBBER

Extremely Resilient with high tensile strength and elongation. Also resistant to flexing and permanent set. Widely used for seals in food and beverage applications.

NITRILE

Good oil resistance. Especially resistant to aromatic hydrocarbons, gasoline, petroleum, vegetable and mineral oils.

HIGHLY SATURATED NITRILE

Similar to Nitrile, but with better heat resistance. Best in high flex, high tensile applications.

NEOPRENE

Moderate oil resistance. Good all purpose material for indoor and outdoor use.

SBR

Not oil resistant. Low water absorption properties.

EPR/EPDM

Not oil resistant. Low water absorption properties.

BUTYL

Extremely low permeability. Excellent where low outgassing is needed. Also extremely low resilience.

POLYBUTADIENE

Excellent resilience. Typically blended with other polymers.

URETHANE

Outstanding tensile and abrasion qualities. Excellent resistance to wear, ozone, oxygen, kerosene and gasoline

SILICONE

Outstanding resistance to high heat. Excellent flexibility at low temperatures. Excellent weathering resistance. Poor resistance to abrasion, tear and cut growth.

FLUOROSILICONE

Excellent fluid resistance to most hydrocarbon and silicone fluids, fuels oils and solvents. Not suitable for ketones and phosphate esters.

FLUROELASTOMER

Excellent high temperature resistance, but poor at low temperatures. Also resistant to fuel, oil acids and alkalis.

ACRYLIC

Outstanding resistance to heat and hot oil; excellent weathering resistance. Inferior resistance to water and steam.

ETHYLENE ACRYLIC

Similar to Neoprene, but with better heat resistance.

HYPALON

Highly resistant to abrasion, tear and sunlight. Widely used for electrical cable jacketing.

HYDRIN

Good resistance to oils and gasoline. Superior impermeability to gasses and vapor. Very good weathering resistance.