



MATERIAL CHART

Basic Rubber Properties

COMMON NAME	POLYNORBORNENE RUBBER
CHEMICAL NAME	POLYNORBORNENE
ABBREVIATION	PNR
TRADE NAME	NORSOREX, NSX 15NA, NSX 15NB ETC.

This rubber is generally used for special applications where a very soft material is required.

- ▶ Can be produced in the range 15 – 50 IRHD with good damping properties, good as vibration absorber
- ▶ Good low temperature properties, -40°C
- ▶ Low compression set
- ▶ Excellent water and good ozone resistant
- ▶ It is not oil resistant

Service Temperature Range: -40°C to +70°C

COMMON NAME	HYDROGENATED NITRILE RUBBER
CHEMICAL NAME	HYDROGENATED NITRILE BUTADIENE RUBBER
ABBREVIATION	HNBR
TRADE NAME	THERBAN*, TORNAC*, ZETPOL*

HNBR is the modified version of NBR with improved physical properties, heat and oil resistance.

- ▶ Good heat/chemical and oil resistance/suitable for use in methanol and methanol/hydrocarbon mixtures if the correct ACN level is selected
- ▶ Good resistance to hydraulic oil, mineral oil, vegetable oil, kerosene, naphtha, LPG, natural gas
- ▶ Good resistance to silicone oils and silicone greases
- ▶ Good water, salt-water resistance
- ▶ Excellent mechanical properties including strength, elongation, tear, abrasion and compression set
- ▶ Poor resistance to aromatics and polar solvents

Service Temperature Range: -30°C to +150°C

COMMON NAME	ACRYLIC RUBBER
CHEMICAL NAME	POLYACRYLATE
ABBREVIATION	ACM
TRADE NAME	HYCAR

The outstanding property of this material is its resistance to hot oil and to oxidation.

- ▶ Very good resistance to fuels, oils and greases
- ▶ Good resistance to ageing, weathering and ozone
- ▶ Good heat resistance
- ▶ Poor low temperature flexibility
- ▶ Poor resistance to chemicals / water

Service Temperature Range: -10°C to +150°C



COMMON NAME	ETHYLENE ACRYLATE RUBBER
CHEMICAL NAME	ETHYLENE METHYL ACRYLATE
ABBREVIATION	AEM
TRADE NAME	VAMAC

AEM exhibits properties similar to those of Polyacrylate (ACM), but with extended low temperature range and with enhanced mechanical properties.

- ▶ Very good resistance to fuels, oils and greases
- ▶ Very good resistance to ageing, weathering, UV and ozone
- ▶ Good heat resistant
- ▶ Better low temperature flexibility than ACM rubber
- ▶ Good compression set
- ▶ Poor resistance to chemicals/ water

Service Temperature Range: -30°C to +160°C

COMMON NAME	NITRILE RUBBER
CHEMICAL NAME	ACRYLONITRILE-BUTADIENE COPOLYMER
ABBREVIATION	NBR
TRADE NAME	NIPOL, PERBUNAN, BUNA-N, EUROPRENE

NBR is synonymous with the oil resistance and the most widely used rubber for this reason.

- ▶ Good heat and oil resistance
- ▶ Good resistance to petroleum, lubricating, hydraulic oil, mineral oil, vegetable oil, kerosene, naphtha, hydrocarbons, LPG, natural gas, silicone oils and silicone greases
- ▶ Good sewage resistance
- ▶ Good water, salt-water resistance
- ▶ Poor weather and ozone resistance
- ▶ Poor resistance to aromatics and polar solvents

Service Temperature Range: -30°C to +100°C (with special design, -40 to 120°C)

COMMON NAME	NATURAL RUBBER
CHEMICAL NAME	POLYISOPRENE
ABBREVIATION	NR
TRADE NAME	SMR, SIR, STR

NR is the general purpose rubber with very good physical properties, both static and dynamic.

- ▶ Poor heat resistant
- ▶ Poor ozone and weather resistant
- ▶ Good resistance to heat build-up in dynamic parts
- ▶ Good resistance to abrasion in static parts
- ▶ Good resilience
- ▶ Good water, salt-water resistant
- ▶ Good sewage resistant

Service Temperature Range: -60°C to +75°C



COMMON NAME	STYRENE BUTADIENE RUBBER
CHEMICAL NAME	STYRENE BUTADIENE RUBBER
ABBREVIATION	SBR
TRADE NAME	BUNA S, KER, KUMHO SBR

SBR is the general purpose rubber with reasonably good physical properties with reinforcing fillers.

- ▶ Good resistance to brake fluids, alcohols, glycols, silicone oils, silicone greases
- ▶ Good sewage resistant
- ▶ Good water, salt-water resistance
- ▶ Good abrasion resistant
- ▶ Poor resistance to oil, greases and fuels
- ▶ Poor fatigue resistant

Service Temperature Range: -55°C to +85°C

COMMON NAME	ETHYLENE PROPYLENE RUBBER
CHEMICAL NAME	ETHYLENE PROPYLENE COPOLYMER, OR A TERPOLYMER WITH A DIENE
ABBREVIATION	EPM, EPDM
TRADE NAME	KELTAN, VISTALON, JSR, KEP

EPDM is one of the versatile polymers with unique properties that can be engineered for varied applications.

- ▶ Excellent weather, ozone resistant, excellent oxidation, UV resistant, steam resistant
- ▶ Good radiation resistant
- ▶ Excellent resistance to wide variety of chemicals, brake fluids, electrical properties, water, salt-water resistant
- ▶ Good sewage resistance
- ▶ Poor resistance to mineral oil, gasoline

Service Temperature Range: -50°C to +120°C (with Peroxide cure EPDM -50°C to 150°C)

COMMON NAME	CHLOROBUTYL RUBBER
CHEMICAL NAME	CHLORO ISOBUTYLENE ISOPRENE RUBBER
ABBREVIATION	CIIR
TRADE NAME	EXXON

Chloro Butyl rubber is one of the specialty elastomers with unique features.

- ▶ Excellent impermeability, vibration dampening properties, weather and ozone resistant
- ▶ Good chemical resistant such as ketones, alkalis, alcohols
- ▶ Good resistance to vegetable, silicone oils, silicone greases
- ▶ Excellent electrical insulating properties
- ▶ Good resistance to phosphate-ester-type hydraulic fluids
- ▶ Poor salt-water, hydraulic oil, diesel, petrol resistant

Service Temperature Range: -60°C to +120°C



COMMON NAME	SILICONE RUBBER
CHEMICAL NAME	POLYSILOXANES OR POLYDIMETHYL SILOXANES
ABBREVIATION	MQ (METHYL GROUPS ON CHAIN) VMQ (METHYL AND VINYL GROUPS) PMQ (METHYL AND PHENYL GROUPS)
TRADE NAME	SILASTIC

Silicones is the only biodegradable rubber that can be engineered to suit a wide variety of applications.

- ▶ Excellent heat, weather, ozone, water and steam resistant
- ▶ Excellent candidate for FDA applications
- ▶ Excellent electrical properties
- ▶ Moderate mechanical properties and moderate resistance to oil
- ▶ Poor resistance to fuels

Service Temperature Range: -50°C to +200°C
(Max temp. can go up to 250°C and above at intermittent usage)

COMMON NAME	FLUROSILICONE RUBBER
CHEMICAL NAME	FLURO POLYSILOXANES OR POLYDIMETHYL SILOXANES
ABBREVIATION	FMVQ
TRADE NAME	SILASTIC

Fluorosilicones is the hybrid of silicone and fluoro chemistry.

- ▶ Excellent heat, weather, and ozone resistant
- ▶ Excellent low temperature flexibility
- ▶ Good electrical properties
- ▶ Good fuel and oil resistant
- ▶ Moderate physical properties

Service Temperature Range: -50°C to +230°C

COMMON NAME	EPICHLOROHYDRIN RUBBER
CHEMICAL NAME	EPICHLOROHYDRIN
ABBREVIATION	ECO
TRADE NAME	EPICHLOMER

- ▶ High resistance to ageing, oxidation, ozone and hot oil
- ▶ Good resistance to hydrocarbon solvents
- ▶ Moderate low temperature flexibility
- ▶ Poor abrasion resistance and electrical properties

Service Temperature Range: -40°C to 120°C (Special grade max temp. 135°C)



COMMON NAME	CHLOROSULPHONATED POLYETHYLENE
CHEMICAL NAME	CHLOROSULPHONATED POLYETHYLENE
ABBREVIATION	CSM
TRADE NAME	HYPALON

- ▶ Good resistance to ageing, weathering and ozone
- ▶ Low gas permeability
- ▶ Good resistance to chemicals
- ▶ Excellent oxidation resistant
- ▶ Poor low temperature properties

Service Temperature Range : -25°C to 120°C

COMMON NAME	POLYURETHANE RUBBER
CHEMICAL NAME	POLYURETHANE
ABBREVIATION	AU(POLYESTER), EU(POLYETHER)
TRADE NAME	ADIPRENE, ESTANE, GENTHANE , UREPAN, VIBRATHANE, MILLATHANE

- ▶ Very good resistance to ageing, weathering and ozone
- ▶ Very good abrasion resistance, tensile and tear properties
- ▶ Low gas permeability
- ▶ Water sensitive, especially at temperature more than 50°C
- ▶ Poor compression set properties at elevated temperature

Service Temperature Range : -40°C to 80°C

COMMON NAME	PERFLUORO ELASTOMER
CHEMICAL NAME	PERFLUORO CARBON
ABBREVIATION	FFKM
TRADE NAME	CHEMRAZ, KALREZ, PERFLOUR, SIMRIZ, ZALAK

- ▶ Very good heat and chemical resistance than Fluoroelastomer
- ▶ Can be used in extreme condition up to temperature around 300°C or even higher
- ▶ Disadvantages are its difficulty in processing, very high cost, poor physical properties at high temperature and high glass transition temperature which limits usage at low temperature
- ▶ Most material cant be used below zero Celsius and even at normal ambient temperatures but its creep properties are likely to be poor

Maximum Temperature withstand up to 300°C



COMMON NAME	CHLORINATED POLYETHYLENE RUBBER
CHEMICAL NAME	CHLORINATED POLYETHYLENE
ABBREVIATION	CPE
TRADE NAME	TYRIN

- ▶ Good chemical resistance to hydrocarbon fluids and elevated temperatures
- ▶ Excellent ozone and weather resistant
- ▶ Moderate resistance to petroleum based fluids
- ▶ Poor mechanical strength
- ▶ Mechanical properties may deteriorate above 100°C

Service Temperature Range: -40°C to 150°C

COMMON NAME	CHLOROPRENE RUBBER
CHEMICAL NAME	POLYCHLOROPRENE
ABBREVIATION	CR
TRADE NAME	NEOPRENE, SKYPRENE, BAYPRENE

CR is the first specialty synthetic rubber introduced with improved heat and oil resistant when compared to NR and SBR.

- ▶ Good physical properties, both static and dynamic
- ▶ Good resistance to petroleum, mineral, lubricating oils, hydraulic oils, kerosene, LPG, natural gas, silicone oils and silicone greases
- ▶ Good water, salt-water resistant, sewage resistant
- ▶ Good resistance to radiation
- ▶ Good flame retardant properties when compounded properly
- ▶ Good electrical properties
- ▶ Good ozone resistant
- ▶ Poor fuel resistant

Service Temperature Range: -40°C to +100°C

COMMON NAME	FLUROELASTOMERS
CHEMICAL NAME	FLUROCARBON
ABBREVIATION	FKM
TRADE NAME	VITON, DAI-EL, DYNEON

Fluroelastomer is one of the important classes of rubber with outstanding combination of heat, fuel and oil resistant.

- ▶ Excellent heat, oxygen and ozone resistant
- ▶ Excellent resistance to fuel oil, diesel oil, hydraulic petroleum oil, kerosene, lubricating oils, mineral oil
- ▶ Excellent resistance to gasoline, naphtha, natural gas, LPG
- ▶ Excellent permeability properties
- ▶ Outstanding resistance to chemical attack by oxidation, by acids and by fuels

Service Temperature Range: -18°C to +200°C

(Special grades for low temperature application is available)