

MATERIAL SELECTION GUIDE

NBR

Nitrile Rubber

Nitrile Rubber (NBR) is the general term for Acryl-Nitrile Butadiene mixed polymer. The Acryl-Nitrile content varies in technical products from 18%-50% and influences the elastomer's physical properties. The higher the Acryl-Nitrile content, the better the oil and fuel resistance. At the same time, the low temperature flexibility, the elasticity and the compression set is adversely affected. NBR has good mechanical properties when compared with other elastomers and a particularly high wear resistance.

KF

Viton / Fluoro Rubber / FKM

Viton is a brand of synthetic rubber and fluoropolymer elastomer commonly used in o-rings, diaphragms, gaskets and other molded rubber parts. Fluorine is the base material or compound and various types or grades of Viton have different fluorine content or composition. Viton has excellent resistance to high temperatures (up to 400 deg Fahrenheit), ozone, oxygen, mineral oils, synthetic hydraulic fluids, fuels, aromatics and many organic solvents and chemicals. Viton is a registered trademark of DuPont Performance Elastomers LLC.

AF

AFLAS

AFLAS TFE elastomer is a unique tetrafluorethylene and propylene copolymer that can be peroxide or electron beam cured. Its structure provides high temperature resistance, a broad range of chemical resistance and excellent electrical properties. It is an elastomer that is commonly used for high temperature/high purity applications, or for highly aggressive applications. AFLAS is particularly well suited to ozone treated water. AFLAS is a registered trademark of 3M.

HNBR

Hydrngenated Nitrile

HNBR (commonly called Nitrile Rubber or BUNA-N) is a highly saturated, oil-resistant elastomer, manufactured by subjecting the unsaturated bonds in NBR (a widely used, oil-resistant rubber) to a special hydrogenation process. HNBR exhibits excellent heat, ozone and chemical resistance properties through the introduction of saturated bonds into the main chain. Like NBR, HNBR exhibits good oil resistance and processibility.

ACM

Ethyl Polyacrylate Rubber

ACM or simply Acrylate Rubber consists of a base and a curing monomer. The basic monomer (rubber base) contains differing Acrylate Esters which influence the physical properties of the compound. Acrylate Rubber has a good resistance to mineral oils, oxygen and ozone and also performs well at high temperatures. The water compatibility and cold flexibility of ACM are better than NBR. ACM is frequently used as an alternative material to Silicone.

VA

Ethylene Acrylate Rubber (VAE, AEM, VAMAC)

Ethylene Acrylate Rubber is a mixed polymer of Ethylene and Methyl Acrylate with the addition of a small amount of carboxylated curing monomer. Thylene Acrylate Rubber is not to be confused with Ethyl Acrylate Rubber (ACM)

- NR** **Natural Rubber**
Natural Rubber is refined from sap of rubber trees. It has high tensile strength and is good for rubber extrusions. However, it lacks heat and weather resistance.
- EPDM** **Ethylene Propylene Rubber**
EPM is a rubber manufactured as a copolymer of Ethylene and Propylene. Ethylene-Propylene-Dien Rubber (EPDM) is produced by using a third monomer and is particularly useful for sealing hydraulic fluid and in brake systems which use a fluid with a Glycol base. EPDM (along with Viton and BUNA-N) is a commonly used material in pump sealing applications as well.
- PU** **Polyurethane Rubber**
Polyurethane elastomers demonstrate excellent wear resistance, high tensile strength and high elasticity. The permeability is good and comparable with IIR (see below).
- ECO** **Epichlorohydrin**
ECO has similar oil resistance with high acrylonitrile content NBR. The normal serving temperature ranges change because of different copolymers: 113 deg F – 275 deg F
- CS** **Polyethylene Hypalon**
CSM, or chlorosulfonated polyethylene synthetic rubber, is a patented rubber manufactured by DuPont Dow Elastomers. It has great heat, weather, and ozone resistance. It is also often used in products which are in contact with sulfuric acid or nitric acid due to its excellent acid resistance. Normal temperature ranges are from 113 deg F – 248 deg F.
- NP** **Polyblend**
This material is made with NBR and PVC, generally the content of NBR is 60%-70% and the balance PVC. This copolymer has NBR physical properties and increases the properties of weather and ozone resistance.
- IIR** **Butyl Rubber**
Butyl Rubber (Isobutylene, Isoprene Rubber, IIR) is produced by many companies in different types and differs widely in Isoprene content. Isoprene is used for the Vulcanization. Butyl has a low gas permeability rate and very good electrical properties.
- SE** **Silicone Rubber**
Silicone elastomers as a group have a relatively poor tensile strength and tear/wear resistance. However, they have many special properties. Silicones in general have good heat resistance to 446 deg F and good cold flexibility to -163 deg F. Silicone has good weathering resistance, good insulating characteristics and physiologically neutral properties.
- FL** **Fluoro Silicone**
Fluorosilicone Rubber contains Trifluoropropyl groups next to Methyl groups. The mechanical and physical properties are very similar to Silicone. Fluorosilicone rubber offers an improved fuel and mineral oil resistance however.

For more detailed information on material compatibilities of rubber materials specific to your applications, please contact ENA Advanced Rubber Technologies, 3032 Barrow Drive, Raleigh, North Carolina 27616, Telephone: (919) 803-0229, or email us at sales@enarubber.com