Common Properties of Rubber Elastomers

Natural Rubber (NR) Gum

As the name would indicate, this elastomer occurs naturally and comes from the latex of certain trees and plants. After the latex is processed, it becomes an elastomer with excellent mechanical properties. It has excellent tensile, elongation, tear resistance and resilience. It has good abrasion resistance and excellent low temperature flexibility. Without special additives, it has poor resistance to ozone, oxygen, sunlight and heat. It has poor resistance to solvents and petroleum products. Useful temperature range is -67° F to +180° F (-55° C to +82° C).

Ethylene-Propylene (EPDM) (EPR)

This is a terpolymer of ethylene, propylene and a diene monomer. It has outstanding resistance to oxygen, ozone, and sunlight. Its resistance to polar materials such as phosphate esters, many ketones and alcohol. It has good electrical properties, low temperature flexibility, excellent heat, water and steam resistance. Its resistance to petroleum products is poor. Useful temperature range is -58° F to +300° F (-50° C to +150° C).

Nitrile / Buna-N (NBR)(Hycar)

This is a copolymer of acrylonitrile and butadiene. It has excellent physical properties, however its claim to fame is based on its resistance to water, petroleum products and fuels. When compounded properly, it has good low temperature properties as well as good heat resistance. It does not have good ozone, oxygen or sunlight resistance without the addition of special additives. Useful temperature range is -40° F to +275° F (-40° C to +135° C).

Neoprene / Chloroprene (CR)

This elastomer is made by the polymerization of Chloroprene. It has excellent physical properties. It is moderately resistant to petroleum products, sunlight, ozone and heat. It is flame resistant and will not support combustion. Useful temperature range is -40° F to +275° F (-40° C to +135° C).

Hypalon (CSM)

Hypalon is a chlor-sulfonated polyethylene. It has outstanding oxygen, ozone and weather resistance. It has excellent resistance to corrosive chemicals as well as oil and grease. It has excellent abrasion resistance and excellent tensile and elongation. Useful temperature range is -67° F to +320° F (-50° C to +160° C).

Styrene Butadiene (SBR) (Buna-S) (GRS)

This is a copolymer of styrene and butadiene. It has similar properties to natural rubber. Its resistance to solvents and petroleum products is about the same as natural rubber. Water resistance is better. Without special additives, it is vulnerable to ozone, oxygen and sunlight. Useful temperature range is -67° F to +180° F (-55° C to +82° C).

Silicone

Silicone is made from sand and alkyl or aryl halides. It is predominately inorganic material. It has outstanding resistance to temperature extremes. It has excellent vibration damping, and reasonable physical properties such as tensile and elongation. Tear and abrasion resistance are generally poor. Useful temperature range is -148° F to +600° F (-100° C to +315° C