

Abrasion resistance

May be defined as the resistance to wearing away by rubbing or impact in service.

Aging

Accelerated aging tests are run on various materials to find out in as short a period as possible the destructive influence of light, oxygen, heat and ozone. Natural or shelf aging requires many years for proper evaluation, so accelerated aging tests will give comparative values in short periods of time; however, there is no absolute correlation between natural aging and accelerated aging.

Buna-N

See nitrile.

Butyl

Copolymer of isobutylene and isoprene. Generally resistant to animal and vegetable oils, fats and greases. Good resistance to gas permeation. Commonly used for inner tubes. Hardness range: 40-75 duro. Operating temps: -60 to +300 deg. F.

Compression set

This property may be defined as the amount (%) by which a standard test piece fails to return to its original thickness after being subjected to a standard compressive load or deflection for a fixed period of time.

Conductive rubber

Rubber capable of conducting electricity.

Cork

Commonly used in oil and weather exposed applications. Natural resiliency and compressibility. Available also with a psa backing. Can also come with a rubber backing plain or with psa also.

Creep

The progressive relaxation of a given rubber material while it is under stress. This relaxation eventually results in permanent deformation or "set".

Durometer

Implies resistance to indentation by the blunt point of a metal rod, ball or needle. The most commonly used instrument to measure hardness is the Durometer. Several scales are used depending on the hardness range (00, 0, A, B, C, D) but the A scale, ASTM D2240, is used for most rubber compounds. Reading on the scale range from 0 to 100. Sponge and foam are generally measured on the 00 and 0 scales.

Elasticity

The property of an article which tends to return to its original shape after deformation.

Elastomer

A term used to describe elastic polymers with rubber-like behavior.

Elongation

Describes the ability of a rubber compound to stretch without breaking. To describe this property as measured it is more accurate to speak of "ultimate elongation" or "elongation at break" since its value, expressed as (%) of original length, is taken at the moment of rupture.

EPDM

Terpolymer of ethylene and propylene diene monomer. Excellent ozone resistance. Hardness range: 40-90 duro. Operating temps: -20 to +300 deg. F.

Felt

Available in wool or polyester. Used in oil and weather exposed applications. Good vibration absorption and abrasion resistance. Good solvent resistance.

Foam

Available in open and closed cell. Open cell allows for the passage of liquids or gases. Closed cell materials have cells that do not interconnect and do not allow for passage of the above. They are generally used for gasket and sealing applications.

Flame resistance

The resistance to burning or material that will not support combustion under ordinary conditions.

Flex cracking

Rubber articles subjected to repeated flexing have been found to develop small cracks on the surface.

Fluorocarbon

A polymer designed to meet the most rigid requirements. (Viton, Fluorel) in oils, solvents, synthetic lubricants and corrosive chemicals, at elevated temperatures. Hardness range: 55-95 duro. Operating temps: +10 to +600 deg. F.

GRS

See SBR.

Hardness

See Durometer

Heat resistance

The ability of rubber to retain its useful properties under the destructive influence of heat.

Hydrocarbon solvents – aromatic

Solvents having basic benzene structure, usually coal tar types such as benzene, toluene and xylene.

Hypalon

A polymer that is completely resistant to ozone attack under the most extreme conditions; possesses excellent color stability plus the action of acids, bases and many other chemicals. Hardness range: 40-95 duro. Operating temps: -30 to +275 deg F. This is the material of choice for white water rafts.

Low temperature flexibility

The temperature at which the rubber becomes too stiff to function in its intended manner.

Memory

Tendency of a material to return to its original shape after deformation.

Natural rubber

Rubber occurs in the latex of the Hevea (Rubber tree) which is an emulsion or dispersion of rubber in water. The dispersing agent is a natural protein material. The latex occurs in the bark of the Hevea tree outside the cambium or green growing layer. It occurs in tubes or ducts which spiral from left to right as they ascend the tree. To extract latex from the tree the process is called "tapping". This is done by making a spiral cut downward from left to right, almost but not quite, through the bark, with a specially shaped knife that makes a shallow trough in the upper edge of the bark on the lower side of the cut. The latex ducts are cut and the latex flows out into the cut or trough which ends in a metal spout which conducts it into the holding container. Then comes the processing. Most commonly used forms are smoked sheet and pale crepe organic material-latex.

Noted for excellent abrasion resistance. Generally resistant to average concentrations of acids, alcohols, salts and ketones. Not good for ozone resistance. Hardness range: 30-90 duro. Operating temps: -60 to +185 deg. F.

Neoprene

A polymer of chloroprene which is prepared from coal, salt and limestone. Often used for gaskets, pads and strips. Good resistance to moderate acids and chemicals. Good ozone, oil and abrasion resistance. Hardness range: 40-95 duro. Operating temps: -50 to +220 deg. F.

Nitrile

Copolymer of butadiene and acrylonitrile. Butadiene is generally derived from petroleum and acrylonitrile from ethylene oxide and hydrogen cyanide. Nitrile is also known as Buna-N, Hycar, and Paracril. Has excellent resistance to most hydrocarbons, fats, oils, greases, hydraulic fluids, chemicals and solvents. Hardness range: 40 to 95 duro. Operating temps: -40 to +240 deg. F.

Oil resistance

Able to resist the swelling and deteriorating effects of various types of oils.

Oxidation

The reaction of oxygen on a compound, usually by a change in the appearance or feel of the surface or by a change in the physical properties.

Ozone resistance

Withstanding the deteriorating effects of ozone (generally cracking).

Permanent set

When a piece of rubber is stretched and released it does not return to its exact original length but comes to rest somewhat longer than it was before stretching. The increase in length of the rubber strip, expressed as (%) of its original length, is termed "permanent set".

Permeability

Ability or ease in which a liquid or gas can pass through a film of rubber.

Plasticity

When subjected to sufficient shearing stress any given body will be deformed. If, after the stress is removed there is no recovery, the body is completely elastic. A proper balance between these two factors is required.

Polymer

A material formed by the joining together of many (poly) individual units (mer) or a monomer; synonymous with elastomer.

Polyurethane

An organic material noted for its high abrasion, ozone, corona and radiation characteristics. Hardness range 60 to 99 duro. Operating temp: -30 to 185 deg. F.

Pure gum

A soft tan natural rubber. Excellent abrasion resistance. See natural rubber.

Resilience

Capability of a material to return to its original size and shape after deformation. It is generally expressed in percentage of ratio of energy returned by rubber to the energy used in compressing rubber.

SBR

Also known as GRS/Buna-S. Copolymer of butadiene and styrene. Butadiene is a gaseous material generally obtained from Petroleum, and styrene is a reaction product of ethylene and benzene. SBR is an all purpose type synthetic similar to natural rubber. Excellent abrasion resistance. Resistant to water, air, detergents, anti-freeze, salt solutions, alcohols and some acids. An important ingredient in rubber tires. Hardness range: 40 to 90 duro. Operating temps: -50 to 195 deg. F.

Silicone rubber

A semi-organic material containing a silicone. This material is recommended for high temperature, acidic, caustic and dielectric applications. Generally resistant to moderate or oxidizing chemicals. Ozone. Concentrated sodium hydroxide. Hardness range: 40-85 duro. Operating temps: -150 to 460 deg. F.

Specific Gravity

The ratio of the weight to the given bulk to that of the same bulk of water (solids and liquids).

Sponge

See foam.

Tear resistance

The resistance to growth of a nick or cut when tension is applied to the cut specimen. Commonly expressed as pounds per inch thickness.

Tensile strength

The tensile strength of a rubber compound is in its resistance to rupture under tension. It is measured as strength at break and expressed in pounds per square inch of cross section. This property has an absolute value in some applications where the product is actually subjected to tension in service but, like the other tensile properties, it is most frequently used in evaluating compounding materials on a cooperative basis. Force in pounds per square inch required to cause the rupture of a specimen of elastomer material.

Viscosity

The property of fluids and plastic solids by which they resist an instantaneous change of shape, i.e., resistance to flow.

Viton

See Fluorocarbon.

Vulcanization

A thermo-setting reaction involving the use of heat and pressure, which results in greatly increased strength and elasticity of rubber-like materials.