

# Types of Rubber

Rubber is an elastic, hydrocarbon polymer that occurs as a milky, colloidal suspension (known as latex) in the sap of several varieties of plants. Rubber can also be produced synthetically. Rubber has been in use for thousands of years in its natural form, but most types of modern rubber are synthetic, created from different polymers manufactured from petroleum byproducts. This article looks at the different types of rubber, both natural and synthetic.

## Natural Rubber

Natural rubber, also called India rubber and gum rubber, comes from latex found in the *Hevea brasiliensis* tree, the Para rubber tree. A tap is inserted into the tree, and liquid latex drains into collection containers. It is known for its durability and resistance to extreme temperatures. Natural rubber is elastic, flexible, and has resistance to degrading, abrasions, and surface friction. It is used in many consumer and industrial items, including tires, gloves, some types of foam rubber, flooring and roofing, balls, and insulation. Adhesives such as rubber cement also use natural rubber.

## Neoprene Rubber

Neoprene rubber, also known as chloroprene, is an older synthetic rubber. It is less susceptible to degrading, corrosion, and burning than most other synthetic and natural rubbers, so it is often used as a base material in corrosion-resistant coatings, high-pressure gaskets, belts, and adhesives. It is also used for weather-stripping on emergency exits and fire doors and for masks. Its waterproofing and insulating qualities mean that it is often used for aquatic clothing, gear, and equipment. Neoprene is sometimes used as a latex-substitute, for those with allergies, in household goods such as dishwashing globes.

## Silicone Rubber

Silicone rubber, also known as polysiloxane, is highly resistant to temperature extremes as well as ultraviolet rays, ozone, and fire. It is manufactured in many different colors and is very malleable, available as both solid and liquid products. It is an essentially inert material that doesn't react to most chemicals. Due to this inertness, it is one of the few synthetic rubbers that is both hypoallergenic and biocompatible. Silicone is, therefore, often used to make medical equipment such as respiratory masks, surgical gloves, and medical implants. It is also used for food storage containers, baby care items, cosmetics applicators, and cooking utensils. Silicone is a more expensive synthetic rubber, and as a result, has been replaced by other synthetics in most heavy industrial applications where a large amount would be prohibitively expensive to use.

## Nitrile Rubber

Nitrile rubber, also called Buna-N or NBR, is resistant to heat, gas permeability, and oil. Because of its oil resistance, it is often used in the automotive industry for gaskets, o-rings, oil seals, and engine hoses. Nitrile is also utilized in the aviation and aerospace industries for self-sealing fuel tanks and bladders. Its durability and resistances make it widely used for making heavy-duty protective gloves, and also for medical gloves as it is less likely to cause allergies than latex and is sturdier than silicone. It is also used to make various molded goods, floor mats, footwear, and sponges.

## EPDM Rubber

EPDM rubber, which is short for Ethylene Propylene Diene Monomer rubber, is a synthetic rubber compound. It has a strong resistance to hot and cold temperatures, so it is often used in roofing as a waterproofing sealant, and for other outdoor applications such as garage door seals and hoses. EPDM is also used in the automotive industry as a sealant because it is insulating and noise-reducing. It is not resistant against petroleum-based oils, mineral oils, and some other lubricants.

## SBR Rubber

SBR, which is short for styrene-butadiene rubber, is known for being hard and durable. It is also much less expensive than other synthetic. It is widely used for tires because of its durability, and resistance to friction and tearing. These qualities also make SBR useful for shoe soles and replacement heels, rubber cutting boards, and specialty gaskets. It is resistant to hydraulic brake fluids, so it is used for seals in hydraulic braking systems. A liquid form of SBR was once used in making chewing gum.

## Butyl Rubber

Butyl rubber, also known as isobutylene isoprene, is one of the most gas-impermeable, airtight synthetic rubbers. Because of this, it is often used to make inner tubes and air-filled balls in sports, and as a sealant for windows and tires. In its liquid form, butyl is used in diesel and petroleum fuel additives, acting as a cleanser for fuel injectors. It is often used in products designed to clean up oil spills. Food-quality butyl rubber has replaced SBR as the base for most chewing gums.

## Fluorosilicone Rubber

Fluorosilicone rubber, also known as FVMQ, is resistant to extreme temperatures, ranging from -100° F to over 350° F. It is also resistant to transmission fluids, engine oils, fire, synthetic lubricants, and ozone. Because of its ability to be used in extreme temperatures, it's often used in the aerospace and aviation industries. It is a more expensive synthetic rubber, so it is mainly used for these specialized industries.