



HANNA RUBBER COMPANY

Types of Rubber

Silicone Rubber (ASTM D2000 Designation FC, FE, GE E)

Silicone rubber is a versatile, synthetic elastomer made from silicon, oxygen, carbon, and hydrogen. It is highly valued for its unique combination of properties, which make it suitable for a wide range of applications across various industries, such as automotive, aerospace, electronics, and medical devices.

The physical properties of silicone rubber include:

Wide Temperature Range: Silicone rubber can withstand a broad temperature range, typically from -60°C to 200°C (-76°F to 392°F), with some specialized grades tolerating even higher temperatures up to 300°C (572°F) for short periods. This makes it ideal for use in extreme temperature environments.

Excellent Weather Resistance: Silicone rubber is highly resistant to weathering, including ozone, UV radiation, and extreme temperatures. This property makes it suitable for outdoor applications, as it maintains its flexibility and mechanical properties over time.

Good Electrical Insulating Properties: Silicone rubber is a strong electrical insulator, making it ideal for use in high voltage applications, such as insulators and electrical connectors.

Low Compression Set: Silicone rubber exhibits a low compression set, meaning it can return to its original shape after being compressed, making it an excellent sealing material for applications requiring long-term sealing performance.

Water Resistance: Silicone rubber is highly resistant to water and many chemicals, including acids, alkalis, and solvents. This property makes it ideal for use in applications exposed to harsh environments.

Flexibility and Elasticity: Silicone rubber exhibits excellent flexibility and elasticity, with elongation at break typically ranging from 300% to 700%. This enables it to be used in applications that require high deformation or flexibility.

Low Toxicity: Silicone rubber is generally considered to be non-toxic and is used extensively in medical and food applications due to its compatibility with human tissue and its ability to resist bacterial growth.

Low Surface Energy: Silicone rubber has low surface energy, which makes it inherently non-stick and hydrophobic. This property allows it to be used in applications where a non-stick or water-repellent surface is required, such as in mold release agents and coatings.

These physical properties make silicone rubber an attractive material for a wide range of applications. However, it is worth noting that silicone rubber typically has lower tensile strength, tear resistance, (these properties can be substantially improved depending on the compound) and abrasion resistance compared to some other elastomers. Thus, careful consideration of the specific application and environment is necessary when selecting the appropriate type of silicone rubber.