



HANNA RUBBER COMPANY

# Types of Rubber

## Fluorosilicone (ASTM Designation FK)

**Fluorosilicone rubber (FSR), also known as fluorosilicone elastomer, is a synthetic material that combines the beneficial properties of both silicone and fluorocarbon rubbers. It is a high-performance, durable, and flexible material that offers excellent resistance to various environmental factors and chemicals.**

**Some key characteristics of fluorosilicone rubber include:**

**Temperature Resistance:** FSR can withstand a wide temperature range, typically from about -60°C to 200°C (-76°F to 392°F), making it suitable for use in extreme temperature conditions.

**Chemical Resistance:** Fluorosilicone rubber exhibits excellent resistance to a wide range of chemicals, oils, fuels, and solvents, including hydrocarbon-based fluids, lubricants, and diester oils. This makes it a popular choice for applications in the automotive, aerospace, and chemical processing industries.

**Weather and Ozone Resistance:** FSR has excellent resistance to weathering, ozone, and ultraviolet (UV) radiation, making it suitable for outdoor applications and sealing solutions exposed to harsh environments.

**Electrical Properties:** Fluorosilicone rubber has good electrical insulating properties, which makes it suitable for use in electronic devices and components where insulation is required.

**Mechanical Properties:** FSR offers good mechanical strength, flexibility, and elasticity, allowing it to maintain its shape and performance under pressure or when subjected to mechanical stress.

However, fluorosilicone rubber is not recommended for use with concentrated acids, alkalis, or steam, as it has limited resistance to these chemicals.

Due to its unique properties, fluorosilicone rubber is used in various applications, including:

**Automotive and Aerospace Industries:** FSR is used to manufacture gaskets, seals, O-rings, hoses, and diaphragms that are exposed to extreme temperatures, chemicals, and fuels.

**Electronics:** Fluorosilicone rubber is used for sealing and insulating electronic components, providing protection from moisture, chemicals, and temperature fluctuations.

**Chemical Processing:** FSR components, such as gaskets and seals, are used in chemical processing equipment to resist corrosion and maintain performance in harsh environments.

**Medical Devices:** In some cases, FSR may be used in medical devices or equipment, where its biocompatibility, chemical resistance, and temperature resistance are advantageous.

The history of fluorosilicone rubber dates back to the 1940s, when it was first developed by Dow Corning (now Dow Silicones) in response to the need for materials with enhanced performance characteristics in extreme environments. Since then, it has seen significant growth and development, becoming a crucial material in multiple applications.



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Throughout its history, fluorosilicone rubber has been known by several tradenames, depending on the manufacturer. Some popular tradenames for fluorosilicone rubber include:

**Silastic®:** This is a registered trademark of Dow Silicones Corporation, formerly Dow Corning. Silastic® is a well-known brand for various silicone elastomers, including fluorosilicone rubber.

**Fuorel®:** This is another trademark of 3M, an American multinational conglomerate corporation. 3M produces a range of fluorosilicone rubber products under the Fuorel® brand.

**Technoflon® FSR:** This is a fluorosilicone rubber product line manufactured by Solvay Specialty Polymers, a leading global supplier of high-performance materials.

It is essential to note that the properties and characteristics of fluorosilicone rubber can vary depending on the specific formulation and the manufacturer. Therefore, it is crucial to consult the manufacturer's specifications and guidelines when selecting a fluorosilicone rubber for a particular application.