



# Viton™ Fluoroelastomers

Reliable Sealing Performance  
for Mission-Critical Systems



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A Partner of Viton™,  
a Brand of The Chemours Company

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## Executive Summary

Aerospace and military systems operate in some of the most demanding environments encountered by engineered materials. Extreme temperatures, aggressive fuels and fluids, pressure differentials, and long service intervals place exceptional demands on elastomeric components. Within this context, Viton™ fluoroelastomers from Chemours are widely used in sealing and containment applications where reliability, chemical resistance, and long-term performance are essential.

This white paper examines how Viton™ fluoroelastomers are positioned to support aerospace and military applications, with a focus on material attributes, sealing performance, and application areas relevant to R&D chemists and engineers designing for mission-critical systems.

### The Challenge: Material Demands

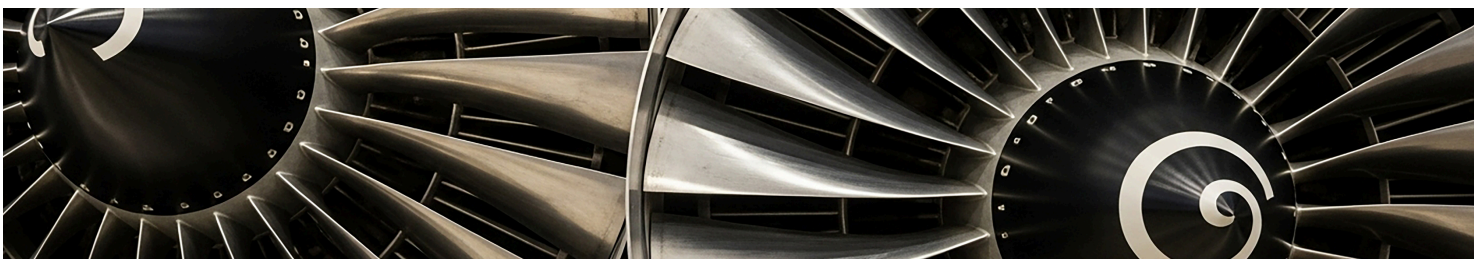
Aerospace and defense equipment must function reliably under conditions that are unforgiving and often inaccessible for repair. Systems used in aircraft, spacecraft, satellites, and military hardware are exposed to the following:

- Extreme and rapidly changing temperatures
- Aggressive fuels, hydraulic fluids, oils, and oxidizers
- Mechanical stress, vibration, and pressure cycling
- Long service intervals where maintenance opportunities are limited

Failures in sealing or containment can compromise safety, system integrity, and mission success. As a result, elastomer selection is a critical design decision, particularly for components used in fuel systems, propulsion, hydraulics, and sensitive equipment housings.

### Viton™ Fluoroelastomers: Engineered for Durability

Viton™ fluoroelastomers are recognized for their chemical resistance and mechanical integrity, making them well suited for sealing applications in demanding aerospace and military environments. Viton™ FKM is engineered to maintain performance where other elastomers may degrade or lose sealing capability.



# Technical Comparison

## Viton™ Fluoroelastomers vs. General Elastomer Materials

Performance Consideration	Viton™ Fluoroelastomers	General Elastomer Materials*
<b>Primary Use in Aerospace &amp; Military</b>	Sealing and containment applications in mission-critical systems, including fuel handling, engines, hydraulics, electrical components, and hazardous fluid transfer	Used across a broad range of sealing and cushioning applications, with suitability dependent on environment and exposure conditions
<b>Resistance to Extreme Conditions</b>	Resistant to degradation from extreme temperatures, wear, UV exposure, and aggressive chemicals, such as fuels, hydraulic fluids, oils, oxidizers, and acids	Performance varies widely by elastomer type and formulation; resistance is often limited to specific temperature or chemical environments
<b>Chemical Resistance</b>	Broad resistance to aggressive aerospace and military fluids, supporting long-term sealing performance	Typically designed for narrower ranges of chemical exposure, depending on elastomer chemistry
<b>Mechanical Integrity</b>	Maintains elasticity and mechanical properties under harsh operating conditions	Mechanical performance may change under prolonged exposure to heat, chemicals, or mechanical stress
<b>Permeability</b>	Low permeability, enabling effective containment across a broad range of substances	Permeability characteristics depend on elastomer type and may limit suitability for certain fluids or gases
<b>Compression Set Resistance</b>	Designed to support long-term sealing reliability and durability	Compression set behavior varies by elastomer chemistry and service conditions
<b>Dielectric Properties</b>	Provides dielectric strength for insulation in sensitive aerospace and military equipment	Electrical properties vary and may not be suitable for all sensitive or high-reliability applications
<b>Specification Alignment</b>	Parts fabricated from Viton™ FKM can meet key MIL-SPEC and AMS requirements	Compliance depends on material selection, formulation, and qualification process
<b>Service Life Expectations</b>	Supports extended service intervals and reduced maintenance frequency in critical systems	Service life varies significantly based on environment, exposure, and material selection

\*Refers broadly to nonfluoroelastomer materials; included for conceptual comparison only. Performance characteristics vary by chemistry, formulation, and application.

## Elastomer Comparison Chart

Type of Elastomer	High-Temperature Resistance	Fuel Resistance (ASTM Fuel C)	Fluid Resistance	Fuel-Permeation Resistance
Viton™ Fluoroelastomers	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓✓
Fluorosilicone	✓✓✓	✓✓✓	✓✓✓	✓✓
Nitrile (NBR)	✓✓	✓✓	✓✓	✓✓
Hydrogenated Nitrile (HNBR)	✓✓✓	✓✓✓	✓✓✓	✓✓
Acrylic (ACM)	✓✓✓	✓	✓✓✓	✓
Ethylene-Acrylic (AEM)	✓✓✓	✓	✓✓✓	✓
Silicone	✓✓✓✓	✓	✓	✓

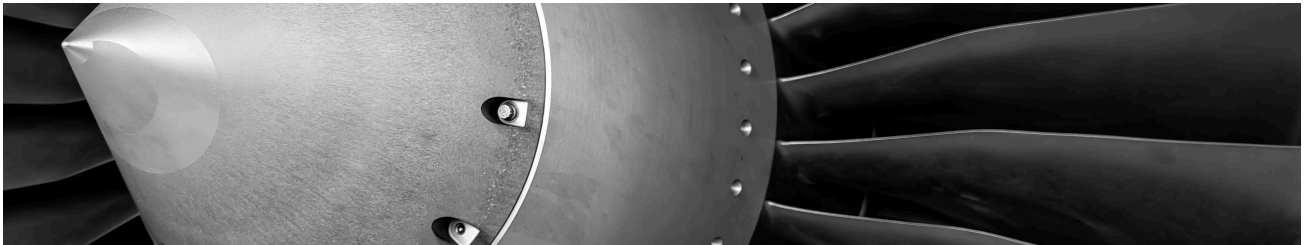
✓ Poor ✓✓ Moderate ✓✓✓ Good ✓✓✓✓ Excellent

## Aerospace and Military Applications: Supporting System Reliability

In aerospace systems, component reliability directly affects safety, maintenance schedules, and operational continuity. Viton™ fluoroelastomers are used in applications where long-term sealing performance is required under exposure to fuels, temperature extremes, and mechanical stress.

### Documented aerospace applications include the following:

- Fuel handling systems, such as hoses, pumps, and valves
- Engine sealing applications
- Power transmission systems
- Electrical components, including O-rings, shafts, and joints
- Liners, tubing, hoses, and sheets for hazardous fluid transfer and containment
- Custom extrusions and gaskets



### Performance Where It Matters

Viton™ fluoroelastomers offer a combination of properties relevant to mission-critical sealing applications:



Low permeability, supporting effective containment across a broad range of substances



Dielectric strength, enabling reliable insulation for sensitive equipment



Mechanical integrity, maintaining elasticity and sealing performance under harsh operating conditions



Compliance potential, with parts fabricated from Viton™ FKM able to meet key MIL-SPEC and AMS requirements

## Why Choose Viton™ Fluoroelastomers

- ✓ Long-term sealing reliability
- ✓ Resistance to aggressive fluids and environmental exposure
- ✓ Compatibility with mission-critical systems require consistent performance
- ✓ Alignment with applicable military and aerospace specifications

**SCAN. CONNECT. SOLVE.**



Scan the QR code to talk to ChemPoint's technical specialists about which Viton™ Fluoroelastomer works best for your adhesive formulation and performance goals.