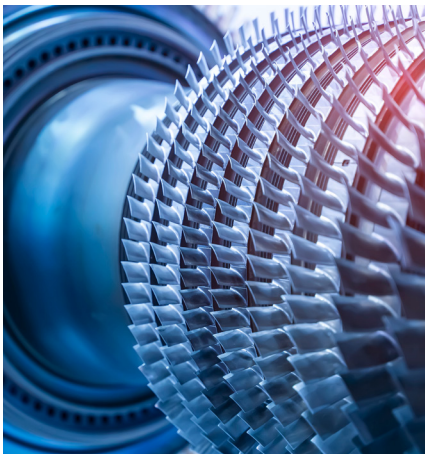
ENGINEERING GUIDE

Selecting Silicone & Fluorosilicone Gaskets for Aerospace & Avionics

Stockwell ELASTOMERICS



Material Selection Can Determine Long-Term Seal Performance

Aerospace gaskets and seals must maintain reliable performance through demanding combinations of temperature, vibration, pressure changes, environmental exposure and long service life.

The challenge is not simply selecting an elastomer that meets an operating-temperature requirement. Engineers must also consider compression set, closure force, fluid exposure, material thickness, gasket geometry and how the component will ultimately be manufactured.

Evaluating these factors early can help reduce qualification risk and create a more efficient path from prototype to production.

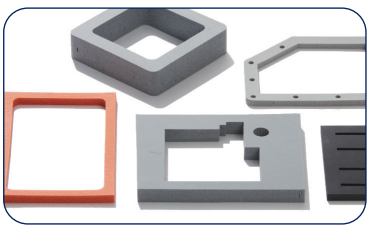
Silicone: A Versatile Choice for Aerospace Sealing

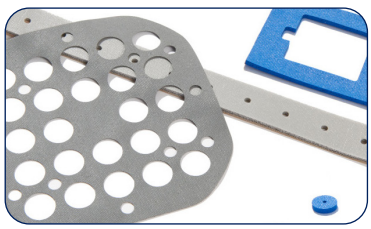
Silicone elastomers are widely used in demanding aerospace applications because of their broad temperature capabilities, environmental stability and resistance to compression set.

Depending on the formulation, silicone materials can be considered for:

- Avionics enclosure gaskets
- Environmental seals
- Electronic equipment
- Access panels
- Vibration isolation
- Thermal and cushioning pads
- Pressure-sensitive adhesive-backed gaskets

Silicone is available in solid, sponge and foam constructions, giving engineers flexibility to balance sealing performance with available closure force.







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Selecting Silicone & Fluorosilicone Gaskets for Aerospace & Avionics

When Should Engineers Consider Fluorosilicone?

Standard silicone provides excellent environmental and temperature performance, but applications involving sustained exposure to fuels, oils and hydrocarbons may require additional chemical resistance.

Fluorosilicone combines many of silicone's desirable temperature and mechanical properties with improved resistance to fuels and oils.

This can make fluorosilicone particularly valuable for components located near fuel systems, engine systems or other areas where hydrocarbon exposure is a design consideration.

The decision between silicone and fluorosilicone should therefore consider the complete operating environment—not temperature alone.

Compression Set Matters

A gasket that seals properly during initial testing still needs to maintain sufficient sealing force after extended compression.

Compression set describes a material's tendency to remain permanently deformed after being compressed. Excessive compression set can reduce sealing force over time and potentially create a leak path.

For long-life aerospace applications, engineers should evaluate compression-set performance alongside temperature, environmental exposure and anticipated service life.

Design for the Right Compression

Material selection and gasket geometry work together.

Insufficient compression can prevent the gasket from establishing an effective seal. Excessive compression can increase closure forces, damage softer materials or reduce gasket life.

For many elastomer gasket designs, controlled compression should be established as part of the design process rather than relying solely on nominal gasket thickness.

Stockwell's applications engineering team can help evaluate material thickness, compression targets, gasket geometry and mating surfaces to identify potential issues before production.

Don't Overlook EMI Shielding

Avionics applications may require the gasket to provide more than an environmental seal.

Conductive elastomers can combine environmental sealing with electrical conductivity to help maintain grounding continuity and control electromagnetic interference at enclosure interfaces.

Stockwell Elastomerics fabricates conductive silicone gaskets and other EMI shielding components for high-reliability electronic applications.

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Prototype Before Committing to Production Tooling

Early prototypes allow engineers to evaluate fit, compression, assembly and material performance before finalizing a production design.

Stockwell's rapid-response capabilities support quick-turn prototypes using processes such as waterjet cutting, allowing engineers to evaluate actual gasket materials and geometries.

Once the design is validated, manufacturing can transition to the process that best supports production requirements.

Prototype → Design Validation → Die-Cut or Molded Production

This scalable manufacturing approach helps maintain continuity between development and production while reducing the need to qualify a new supplier as programs mature.

Aerospace Quality and Traceability

Material documentation, process control and traceability are especially important when components transition from development into aerospace production.

Stockwell Elastomerics maintains an AS9100-certified quality management system and is ITAR registered, supporting aerospace and defense programs with controlled manufacturing processes and material traceability.

Bring Us Your Sealing Challenge

Whether you're evaluating silicone versus fluorosilicone, troubleshooting compression, developing an avionics enclosure or preparing a new design for qualification, Stockwell's applications engineering team can help.

Request a Complimentary DFM Consultation

Discuss material selection, gasket geometry, compression requirements and rapid prototype options with our engineering team.

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