Silicone RTVs in Aerospace & Aviation
We're the science behind proven flight.

When it comes to assembling, sealing and protecting critical components in the air or in space, why leave anything to chance? Having developed silicone materials used on every manned US space flight, including the material used to produce the sole of the boot that first imprinted the moon, Momentive sets the standard of excellence in aerospace and aviation silicone technologies. We are proud of our long standing relationships and contributions to the successes of the world’s venture into outer space.

From the beginning, our company has been at the forefront of silicone advances. Our scientists came up with the first “direct process” for making methylchlorosilanes, the key building block for all silicone products today. We developed the first silane coupling agent for fiberglass and composites, the first construction sealant that hardens at room temperature, and the first successful one-part addition cure technology for adhesives. It is Momentive’s history and flight time in aviation and aerospace that separates its product offerings from others in the industry. Our strength is deeply rooted in the long and prestigious history of GE technology, innovation, technical service, and application engineering. From materials used for bonding thermal shields on space shuttles and rockets, to aircraft assembly adhesives and sealants, to vibration-dampening potting materials for vital electronics, our silicone RTVs keep air and spacecraft operating smoothly.

Momentive produces a wide range of materials used in a multitude of mechanical, electrical, and sealing applications. These products are designed for use in challenging conditions and include sealants, adhesives, potting and encapsulating compounds, optical materials, and thermal management materials. Our flight heritage, value-added process innovations, global reach, and commitment to successful business relationships can help you reduce costs, heighten quality, and soar above the competition.

Ask your sales representative how Momentive may serve your aerospace and aviation needs.
# Potential Applications

## Product/Application Selector Guide

### One-Component

<table>
<thead>
<tr>
<th>Potential Applications</th>
<th>RTV 100 series</th>
<th>RTV 106</th>
<th>RTV 116</th>
<th>RTV 133</th>
<th>RTV 142</th>
<th>RTV 157</th>
<th>RTV 160</th>
<th>RTV 162</th>
<th>RTV 167</th>
<th>FRV 1106 Base/adhesion</th>
<th>SilCoF* thermal management systems</th>
<th>SnapR* heat cure adhesives</th>
<th>RTV 11</th>
<th>RTV 21</th>
<th>RTV 41</th>
<th>RTV 31</th>
<th>RTV 38</th>
<th>RTV 560</th>
<th>RTV 566</th>
<th>RTV 571</th>
<th>RTV 577</th>
<th>RTV 567</th>
<th>RTV 6136</th>
<th>RTV 6130</th>
<th>RTV 6000 series</th>
<th>RTV 7000 foam</th>
<th>Invisible* optical encapsulants</th>
</tr>
</thead>
</table>

### Two-Component

| Potential Applications | RTV 100 series | RTV 106 | RTV 116 | RTV 133 | RTV 142 | RTV 157 | RTV 160 | RTV 162 | RTV 167 | FRV 1106 Base/adhesion | SilCoF* thermal management systems | SnapR* heat cure adhesives | RTV 11 | RTV 21 | RTV 41 | RTV 31 | RTV 38 | RTV 560 | RTV 566 | RTV 571 | RTV 577 | RTV 567 | RTV 6136 | RTV 6130 | RTV 6000 series | RTV 7000 foam | Invisible* optical encapsulants |
|------------------------|----------------|--------|--------|--------|--------|--------|--------|--------|--------|-------------------------|-------------------------------|---------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|

---

*All products are room temperature cure systems, exceptions noted. MIL-PRF subject to further qualification.

Please contact a Momentive representative to determine product availability in your region.
**Superior Products for Aviation & Aerospace**

**One-Component, Room Temperature Cure Adhesives/Sealants**

- **RTV 100** series product family is Momentive’s premier line of acetoxy-cure adhesives with FDA, UL, NSF, and USDA recognition, and meets MIL-A-46106 specifications. This high performance line, in both paste and flowable grades, offers primerless adhesion to many substrates. Both RTV 106 and RTV 116 adhesives offer high temperature performance.

- **RTV 133** is a black, one-component adhesive that is suggested where resistance to burning of the finished product is a design consideration. It offers high strength, primerless adhesion to many substrates and a non-corrosive (alkoxy) cure. It has UL94 V-0 component recognition.

- **RTV 142** is a non-corrosive, low-volatile paste adhesive that can be considered for electronic gasketing or vertical/overhead applications.

- **RTV 157** and **RTV 159** are high strength, paste adhesives with an acetoxy cure. RTV 159 offers high temperature and high strength performance.

- The RTV 160 series of adhesives are non-corrosive to sensitive metals found in electronics. This series offers products of varying viscosities and UL component recognition. RTV 162 and RTV 167 are paste adhesives that comply with MIL-A-46146. RTV 167 is a high strength paste. RTV 160 is a flowable material.

- The adhesive sealant FRV 1106 is a paste consistency, fluid resistant product for use in fuel, solvent and chemical environments. This acetoxy-cure sealant offers primerless adhesion, room temperature cure, and weathering resistance.

- **SilCool** thermally conductive TSE 3000 series of adhesives are available in both room temperature and heat cure, as well as one and two-component options. This series of materials has a variety of viscosities from flowable to paste-like. SilCool thermally conductive TIG series of greases are also available for applications needing removability/reworkability.

**Two-Component, Room Temperature Cure Adhesives/Sealants and Potting Compounds/Encapsulants**

- **SnapSil** fast cure RTV 200 series of adhesives are a line of fast room temperature curing, two-component high strength adhesives that can be considered for applications on assembly lines to quick turn around maintenance and repair. Available in a convenient single caulk, it is easy to use with a standard caulking gun. The RTV 200 series adheres to most substrates with no primer necessary.

- **RTV 11**, **RTV 21** and **RTV 41** are three of Momentive’s general-purpose two-part silicone encapsulants that can be an excellent choice for the aviation environment. They cure at room temperature and offer superior adhesion with primers.

- **RTV 31**, **RTV 60** and **RTV 88/88HB**, part of Momentive’s high temperature two-part silicone materials, offer primarily in viscosity in the uncured state. RTV 31 and RTV 60 can be excellent choices for potting and encapsulating applications, while RTV 88/88-B can be considered for vertical or overhead surfaces.

- **RTV 560**, **RTV 566**, **RTV 567**, **RTV 511**, and **RTV 577** can provide outstanding adhesion with a primer at low temperatures. All cure at room temperature and provide variable cure rates by adjusting the curing agent. RTV 560 and RTV 566 offer the widest useful temperature range of all Momentive products (-115°C to +260°C). RTV 566 and RTV 567 can be excellent choices for aviation/aerospace applications requiring low outgassing. RTV 511 is a flowable sealant. RTV 577 is highly viscous and an outstanding choice for sealing and insulating on vertical and overhead surfaces.

- **RTV 6100** series of silicone dielectric gels are liquid silicones, which cure to form soft, gel-like elastomers. They help preserve dielectric integrity, offer shock and vibration dampening, and provide outstanding protection to delicate electronic assemblies in harsh environments. They offer a variety of cure rates and primerless adhesion to most substrates. **RTV 6136** is a high strength gel; **RTV 6196** is a fast curing gel.

- **The RTV 8000** series are general purpose two-part silicone rubber compounds. They consist of pourable, non-corrosive grades with excellent adhesion and high temperature performance. They conform to the physical and electrical requirements of MIL-PRF-23386F (Supersedes MIL-S-23386E).

**Two-Component Potting Compounds/Encapsulants**

- **RTF 7000** is a variable density foam that is supplied as a two-component liquid that chemically react when mixed to generate foam.

- **The InvisiSil** optically clear encapsulants series of products are two-part optically clear, non-yellowing, heat curable gels and elastomers. This series of products have high light transmittance and a high refractive index. Typical applications for these products are LED encapsulants as well as inner layer materials for displays and coating on optical devices.
Superior Products for Avionics

Long-term, reliable protection of sensitive electronic components is essential to many electronic applications today. Increasingly small systems and rising circuit densities have resulted in hotter operating temperatures, and driven demand for high-performance solutions for heat dissipation. Designers confronting these challenges will find a range of solutions from Momentive Performance Materials. Our SilCool® family of adhesives and compounds deliver the high-thermal conductivity, thin bond lines, and low thermal resistance required for high performance components. For applications requiring environmental or stress protection, Momentive offers a selection of silicone adhesives/sealants, encapsulants, and potting materials.

Thermally Conductive Silicone Grease Compounds

Momentive’s thermally conductive SilCool grease compounds can offer excellent thermal conductivity, as well as excellent stability, penetration, temperature resistance, and low bleed. These properties enable SilCool grease compounds to draw heat away from devices, contributing to improved reliability and operational efficiency of electronic components. The combination of processing performance and thermal conductivity that these grease compounds offer makes them good candidates for thermal interface applications in high-performance devices and packages, such as TIM2 applications in CPUs and MPUs.

Thermally Conductive Silicone Adhesives

Momentive Performance Materials developed its family of SilCool thermally conductive adhesives to help deliver thin bond lines, which contribute to low thermal resistance while providing excellent adhesion and reliability. This series of heat-cured, one-part adhesives excel in thermal interface applications that demand good structural adhesion. Examples include spreaders and heat generators, and thermal interfaces to heat sinks in TIM2 applications. Additional thermal adhesives from Momentive offer the process convenience of one-part condensation cure with moderate heat dissipation. Target applications include board assemblies and sealants in power modules and sensors.

Potting and Encapsulation Materials

Momentive Performance Materials offers a variety of dielectric potting and encapsulation materials to protect electronic components from moisture and harmful contaminants, while providing stress relief protection to circuits from thermal, vibration, and mechanical stress. Momentive offers a range of materials including one and two-part products, elastomeric rubber grades, low-modulus gels, conformal coatings and specialized grades including thermally conductive, flame retardant, and low volatile materials.
Frequently Asked Questions

Why RTV silicone?
RTV silicones consist of rubber and gel products developed for adhesion, sealing, coating and encapsulation/potting applications. The Si-O backbone of silicones provides inherent excellent temperature performance, both high temperature stability and low temperature flexibility, excellent dielectric properties, and outstanding weatherability resistance. With our long history in Aviation and Aerospace, Momentive’s RTV silicones are an excellent choice for many applications.

What is Momentive’s quality assurance?
Momentive has outstanding lot traceability. We conduct quality tests on every batch of silicone and can provide a Certificate of Analysis to our customers upon request. This helps our customers reduce cost by avoiding redundant testing. Additionally, Momentive is an ISO certified facility.

Does cured silicone rubber outgas?
Momentive has formulated specialty RTV grades to reduce outgassing substantially when used under extreme conditions, e.g., high temperature and vacuum. General purpose silicones can outgas under these types of conditions. Please contact Momentive’s Customer Service for technical assistance or for more information.

Do I need to use a primer?
It depends on your application requirements and product choice. For example, one-component RTV products offer primerless adhesion to most substrates, while most two-components do not. Momentive recommends that you test the product in your application before using it.

How can I get Technical Product Data Sheets, samples and MSDS for Momentive materials?
Product Data Sheets and MSDS are available on our web site, www.momentive.com. Sample requests are available through an authorized Momentive distributor or through our Customer Service Centers. See back page for Momentive contact information.
Customer Service Centers

Worldwide Hotline
information@momentive.com
+1 614 986 2495 / T +1 800 295 2392

North America
Silicones – Fluids, UA, Silanes, Specialty Coatings, RTV and Elastomers
T +1 800 332 3390

Consumer Sealants/
Construction Sealants and Adhesives
T +1 877 943 7325

Latin America
South America
T +55 11 4534 9650

Mexico and Central America
T +52 55 2168 7670

Europe, Middle East, Africa and India
T +00 800 4321 1000 / +40 21 3111848

Pacific
China
T +800 820 0202 / +86 21 3860 4892

Japan
T +0120 975 400 / +81 276 20 6182

Korea
T +82 2 6201 4600

Malaysia
T +60 3 9206 1555

DISCLAIMER: THE MATERIALS, PRODUCTS AND SERVICES OF MOMENTIVE PERFORMANCE MATERIALS INC., MOMENTIVE PERFORMANCE MATERIALS USA INC., MOMENTIVE PERFORMANCE MATERIALS ASIA PACIFIC PTE. LTD., MOMENTIVE PERFORMANCE MATERIALS WORLDWIDE INC., MOMENTIVE PERFORMANCE MATERIALS GmbH, THEIR SUBSIDIARIES AND AFFILIATES DOING BUSINESS IN LOCAL JURISDICTIONS (collectively “SUPPLIERS”), ARE SOLD BY THE RESPECTIVE LEGAL ENTITY OF THE SUPPLIER SUBJECT TO SUPPLIERS’ STANDARD CONDITIONS OF SALE, WHICH ARE INCLUDED IN THE APPLICABLE DISTRIBUTOR OR OTHER SALES AGREEMENT, PRINTED ON THE BACK OF ORDER ACKNOWLEDGMENTS AND INVOICES, AND AVAILABLE UPON REQUEST. ALTHOUGH ANY INFORMATION, RECOMMENDATIONS, OR ADVICE CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SUPPLIERS MAKE NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING SUPPLIERS’ PRODUCTS, MATERIALS, SERVICES, RECOMMENDATIONS OR ADVICE. AFOREMENTIONED EXCLUSIONS OR LIMITATION OF LIABILITY ARE NOT APPLICABLE TO THE EXTENT THAT THE END-USE CONDITIONS AND/OR INCORPORATION CONDITIONS CORRESPOND TO THE RECOMMENDED CONDITIONS OF USE AND/OR OF INCORPORATION AS DESCRIBED BY SUPPLIER IN ITS PRODUCT DATA SHEET AND/OR PRODUCT SPECIFICATIONS. EXCEPT AS PROVIDED IN SUPPLIERS’ STANDARD CONDITIONS OF SALE, SUPPLIERS AND THEIR REPRESENTATIVES SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS, PRODUCTS OR SERVICES DESCRIBED HEREIN. EACH USER BEARS FULL RESPONSIBILITY FOR MAKING ITS OWN DETERMINATION AS TO THE SUITABILITY OF SUPPLIERS’ MATERIALS, SERVICES, RECOMMENDATIONS, OR ADVICE FOR ITS OWN PARTICULAR USE. EACH USER MUST IDENTIFY AND PERFORM ALL TESTS AND ANALYSES NECESSARY TO ASSURE THAT ITS FINISHED PARTS INCORPORATING SUPPLIERS’ PRODUCTS, MATERIALS, OR SERVICES WILL BE SAFE AND SUITABLE FOR USE UNDER END-USE CONDITIONS. NOTHING IN THIS OR ANY OTHER DOCUMENT, NOR ANY ORAL RECOMMENDATION OR ADVICE, SHALL BE DEEMED TO ALTER, VARY, SUPERSEDE, OR WAIVE ANY PROVISION OF SUPPLIERS’ STANDARD CONDITIONS OF SALE OR THIS DISCLAIMER, UNLESS ANY SUCH MODIFICATION IS SPECIFICALLY AGREED TO IN A WRITING SIGNED BY SUPPLIERS. NO STATEMENT CONTAINED HEREIN CONCERNING A POSSIBLE OR SUGGESTED USE OF ANY MATERIAL, PRODUCT, SERVICE OR DESIGN IS INTENDED, OR SHOULD BE CONSTRUED, TO GRANT ANY LICENSE UNDER ANY PATENT OR OTHER INTELLECTUAL PROPERTY RIGHT OF SUPPLIERS OR ANY OF ITS SUBSIDIARIES OR AFFILIATES COVERING SUCH USE OR DESIGN, OR AS A RECOMMENDATION FOR THE USE OF SUCH MATERIAL, PRODUCT, SERVICE OR DESIGN IN THE INFRINGEMENT OF ANY PATENT OR OTHER INTELLECTUAL PROPERTY RIGHT.

*InvisiSil, SiCool and SnapSil are trademarks of Momentive Performance Materials Inc.
Momentive and the Momentive logo are trademarks of Momentive Performance Materials Inc.