ResinFormulators
INNOVATIVE MATTERS

LOW-OUTGASSING EPOXIES FOR SPACE APPLICATIONS

Reliable performance for spacecraft, satellites, and high-vacuum environments. Tested to ASTM E595 standards.

When performance in space or high-vacuum environments matters most, engineers and manufacturers rely on Resin Formulators' low-outgassing epoxy systems. Independently tested to ASTM E595, our epoxies meet NASA's rigorous standards for low Total Mass Loss (TML) and Collected Volatile Condensable Material (CVCM), ensuring clean, reliable performance in the most demanding aerospace environments.

COMMITMENT TO QUALITY AND SERVICE

GracoRoberts and Resin Formulators are fully qualified to design, manufacture, and distribute products to a variety of industries. We are independently certified to three rigorous international quality standards: ISO 9001:2015, AS9100 (Rev. D) and AS9120 (Rev. B).

FEATURED PRODUCTS

Application	Product	Capabilities
Potting (Thermally conductive, Dielectric)	**RF 2022 (Mod 1) + RF 619**	Two-part, thermally conductive, low-viscosity dielectric potting material designed for efficient heat dissipation and electrical insulation.
	RF 4407 + RF 81	A fast-curing, low-viscosity potting and encapsulating compound offering reliable dielectric performance and strong adhesion. Formulated for low outgassing applications, the product provides durable protection, good water resistance, and excellent mechanical strength.
	RF 4407 + RF 612	A two-part, low-viscosity dielectric potting resin engineered for superior thermal shock resistance and electrical insulation. The product combines excellent flow characteristics with low outgassing performance, delivering clean, void-free castings for critical aerospace and electronic assemblies.
	RF 5407 + RF 24	A high-performance, aluminum oxide–filled epoxy resin designed for potting and encapsulation requiring superior thermal conductivity and electrical insulation. When cured with RF 24, it delivers a high glass transition temperature exceeding 150 °C (with post cure), long working time, and excellent dimensional stability.
Structural Pastes	**RF 5004 A/B**	A fast-setting, non-slump, toughened epoxy adhesive formulated for strong, reliable bonding across a wide range of substrates. RF 5004 A/B offers excellent room-temperature strength, low shrinkage, and proven low-outgassing performance.
	RF 5063 A/B	A two-part, thixotropic epoxy system engineered for extreme low-temperature performance and exceptional cryogenic bonding. RF 5063 A/B cures at room temperature or with mild heat to deliver strong adhesion and durability down to –160 °C.
	RF 6110 A/B	Toughened, structural epoxy adhesive offering exceptional strength and peel performance at room and elevated temperatures. RF 6110 A/B provides a convenient 2:1 mix ratio, low outgassing, and reliable bonding under extreme thermal conditions.

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FEATURED PRODUCTS (CONTINUED)

Application	Product	Capabilities
Adhesives (Electrically conductive)	**RF 713 A/B**	Silver-filled, thixotropic epoxy providing strong mechanical bonds and excellent electrical conductivity. RF 713 A/B is ideal where soldering isn't practical, offering low outgassing and effective EMI/RFI shielding.
	RF 2869 Mod 2	A one-part, silver filled, electrically conductive epoxy adhesive. This system does not require mixing or vacuum degassing.
	RF 2969 Mod 4	High-strength, silver-filled epoxy offering excellent electrical conductivity and mechanical performance. Ideal where soldering isn't feasible, providing strong adhesion, low outgassing, and effective EMI/RFI shielding for electronic and aerospace assemblies.
	RF 2969 Mod 7	High-strength, silver-filled epoxy designed for applications where soldering is impractical. RF 2969 Mod 7 offers superior electrical conductivity, robust adhesion, and low outgassing with a shorter set time than Mod 4.
Syntactics	**RF 1131 A/B**	Lightweight, non-slump, two-part epoxy core fill paste with excellent workability and a long pot life. RF 1131 A/B offers strong mechanical performance, low density, and reliable low-outgassing characteristics.
	RF 1133 A/B	Lightweight, non-slump, two-part core fill paste offering a long work life and excellent handling. RF 1133 A/B provides strong compressive performance and low outgassing.
	RF 1135 A/B	Heat-curing, non-slump core fill paste offering excellent strength, low density, and extended pot life. RF 1135 A/B can B-stage at ambient temperature and co-cure with most prepregs.
	RF 1141 A/B	Lightweight, two-part syntactic system qualified to SCGMS 58001 for aerospace core filling and reinforcement. RF 1141 A/B is slightly thixotropic for easy vertical application and offers low outgassing with reliable compressive strength.
	RF 1143 A/B	Castable, two-part epoxy syntactic resin combining low density with high compressive strength and excellent dimensional stability. RF 1143 A/B offers reliable low-outgassing performance.
	RF 1163 A/B	High-strength, castable epoxy syntactic resin engineered for elevated-temperature applications. RF 1163 A/B combines excellent compressive performance, thermal stability, and low outgassing.
	RF 1164 A/B	Castable, low-viscosity epoxy syntactic resin formulated for high-temperature structural applications. RF 1164 A/B delivers outstanding compressive strength, thermal stability, and low outgassing.

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SUCCESS STORY

Speed, Strength, and Precision: Advancing Aerospace Production with RF 1163 Epoxy Syntactic Resin

CHALLENGE

A major aerospace manufacturer needed a fast, reliable solution for sealing edges and honeycomb core in large composite structures. They were seeking a material that was:

- High strength, low density
- Non-slump and dispensable for point-of-use
- Fast-setting to keep production moving
- Qualified for high-temp, aerospace environments

SOLUTION

Resin Formulators developed RF 1163 A/B, a high-temperature epoxy syntactic resin supplied in ready-to-use cartridges. This innovative format increased processing efficiency and allowed technicians to mix and dispense material directly where it was needed, saving time, reducing waste, and eliminating FOD potential and cleanup.

With an aggressive ramp rate and 1-hour post cure, RF 1163 set up quickly at room temperature, enabling laminate placement without delays and helping parts move through the line faster.

RESULTS

- **Accelerated throughput:** Faster ramp rate at ambient conditions allowed parts to move through manufacturing more efficiently
- **Strong, lightweight performance**: Compressive strength of 9,300 psi at a density of just 0.66 g/cc
- **Cleaner, safer process**: Cartridge dispensing reduced FOD risk, worker exposure, and material waste
- **Meets NASA outgassing requirements**: Qualifying it for demanding space and aerospace environments such as rocket structures, fuselages, fairings, crew capsules, and space launch vehicles

RF 1163 delivered the speed, strength, and reliability needed to keep critical aerospace production moving on schedule.