



# ResinFormulators

INNOVATIVE MATTERS



## THERMAL MANAGEMENT SOLUTIONS KIT

### RF 5407/24: THE FUTURE OF THERMAL MANAGEMENT

The Resin Formulators Thermal Management Solutions Kit is the time-tested and trusted solution for contactor manufacturers serving the electric vehicle industry. This kit packages best-selling products RF 5407 and RF 24, now made available in two of the most popular size configurations. RF 5407 is an easy-to-use, aluminum oxide filled, liquid epoxy resin with excellent electrical insulation properties and high thermal conductivity for electric vehicle applications. RF 24 curing agent enables the resultant plastic to have low shrinkage during cure, excellent thermal stability and conductivity, and be strong and durable for casting.



### USES & APPLICATIONS

Electric vehicle applications for circuits, charging systems, battery power management, and contactor relays where temperature stability, thermal cycling, electrical insulation, and/or thermal conductivity are required. This includes high voltage relay potting, staking of Li-ion battery cells, and encapsulation of motor windings.

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### SUCCESS STORIES

#### RF 5407: A BREAKTHROUGH MATERIAL FOR HIGH-VOLTAGE CONTACTORS IN RAPID EV CHARGING STATIONS



#### CHALLENGE:

An electronic vehicle component manufacturer needed assistance with the completion of their new 1000 amp high voltage contactor unit, intended for use in rapid charging stations. Standard contactor relays are rated for 500 amps, so a new material was required to withstand the temperatures generated during the transmission of higher frequency currents in a high voltage direct contactor relay.

#### SOLUTION:

RF 5407 was identified as both the hermetic seal and thermal management interface solution for the contactor relay's surface. The result was an improved power transmission through the relay, enabling the creation of sustainable devices capable of withstanding the necessary temperatures for rapid EV charging. RF 5407 is now a qualified material for their device.

#### HOW RF 5407/24 TRANSFORMED ELECTRIC VEHICLE POWER SUPPLY MANAGEMENT



#### CHALLENGE:

A contactor manufacturer supporting electric vehicle production was seeking an alternative product solution to optimize output and production costs. They wanted to replace the traditional capital expense of legacy ceramic housing production with a sustainable and durable epoxy sealing solution.

#### SOLUTION:

RF 5407/24 was employed as their epoxy system to hermetically seal inert gases within the device, withstand thermal fluctuations, and maintain electrical isolation. With this epoxy system, the customer realized the benefits of increased output and reduced costs in bringing their Electric Vehicle power management devices to market.

*Technical data on next page*

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## TECHNICAL DATA FOR RF 5407 WITH RF 24 CURING AGENT

### HANDLING PROPERTIES, TYPICAL

PROPERTY	RF 5407
Mix Ratio: by Weight	100:10.5
by Volume	N/A
Mixed Color	Natural (off-white), White and Black
Viscosity @ 77°F (25°C), cps	110,000 - 150,000
Viscosity @ 140°F (65°C), cps	180,000
Specific Gravity @ 77°F (25°C), cps	2.15 - 2.20
Cure Schedule	30 minutes at 82°C plus 2 hours at 121°C

### PHYSICAL PROPERTIES, TYPICAL CURED PERFORMANCE

PROPERTY	TEST METHOD	UNIT	VALUE
Al-Al Lap Shear (25°C)	ASTM D1002	psi	2,600
DMA Tg - Onset	ASTM E1640-13	°C	134
Lap Shear, PA66, Plasma		psi	1,200
Treat	ASTM E831	ppm/°C	44
CTE (below Tg)	ASTM D257	Ohm-cm	1.6x10E15
Volume Resistivity	ASTM D149	V/mil	>400

### SPECIALTY PACKAGING AND DISPENSING

Material is suitable for pre-mixed and frozen and bulk packaging use. Learn more about our specialty packaging capabilities.

### LAB & TESTING CAPABILITIES

Resin Formulators' in-house testing capabilities speed up the product development timeline by fifty percent, and increases our ability to test for customer specifications, batch requirements, and assist with expedite delivery needs. Our advanced testing equipment enables us to test a wide range of unique physical and mechanical properties and make informed suggestions for production usages.

[Browse our list of advanced testing services.](#)

### COMMITMENT TO QUALITY AND SERVICE

GracoRoberts and Resin Formulators are fully qualified to design, manufacture, and distribute products to a variety of industries. Certifications include ISO9001:2015, AS9100 (Rev. D) and AS9120 (Rev. B).