Liquid Moulding Processes: Infusion / RTM

EPIKOTE™ / EPONOL™ Resin Systems and EPIKURE™ Curing Agents and Catalysts

Hexion Inc. (Hexion) offers a wide range of epoxy and phenolic resin systems for manufacturing intricate parts by RTM and resin infusion. These products are used in the manufacture of:

- **Roof cabins, spoilers and cabs for the truck market**
- **Rotor blades for the wind energy industry**
- **Structural components for aeronautical and aerospace applications**
- **Boats and yachts**
- **Mass production of Automotive structural components for the chassis and exterior parts**

Our epoxy resin infusion systems feature very low viscosity, excellent wetting properties, and the convenience of variable injection and curing times. Use of these systems permits fabrication of the highest quality components with premium surface characteristics and strong resistance to thermal deformation and weathering. Hexion epoxy resins containing internal release agents can reduce cycle times and minimize the need for machine grinding.

In EPIKOTE System 600, Hexion offers a high performance matrix system meeting the highest standards and requirements for mechanical and thermal performance, as well as chemical resistance. In addition, it is easy to handle and comes as a single-component system, with a long pot life and a slow rise in viscosity. This product is cured at temperatures ranging from 120 – 200 °C.

To enhance general process efficiencies, Hexion offers resin systems tailored for the specific customer needs.

Hexion backs all of our systems with ongoing R&D, an experienced technical support team and the global production infrastructure of one of the world's leading specialty chemical companies, assuring consistent supply.

An Overview of Resin Infusion and RTM

Unlike the prepreg process, the resin infusion process starts with untreated reinforcements – glass or carbon fabrics either layered or stitched into preforms – being placed into a mould precoated with an external release agent.

The mould is then closed and evacuated to prevent air pockets. A low-viscosity resin system is injected, either with pressure and/or vacuum support, until the fiber content reaches 50 – 60% by volume.

The crosslinking (curing) reaction which starts at the time of injection is accelerated by heating. Once crosslinking is 80% complete, the part may be demoulded. A post-cure heating cycle can then be applied to enhance the laminate's mechanical and thermal properties.

EPIKOTE™ Epoxy Resin Systems / EPIKURE™ Curing Agents / EPONOL™ Phenolic Resin Systems	Curing conditions		Service-temp. [°C]	Notes	EINECS (Europe)	TSCA (USA)	DSL / NDSL	ECL (Korea)	ENCS (Japan)	IECSC (China)
	Time [min]	Temp. [°C]								
Infusion Systems										
EPIKOTE Resin MGS RIM 235 EPIKURE Curing Agent MGS RIM H 237	5	70	70	Low viscosity.	• •	+ +	+ +	+ +	+ +	+ +
EPIKOTE Resin MGS RIMR 135 EPIKURE Curing Agent MGS RIMH 137	5	70	70	15+ years track record.	• •	+ +	+ +	+ +	- +	+ +
EPIKOTE Resin MGS RIMR 035c EPIKURE Curing Agent MGS RIMH 036-037- 038	6	70	70	Low exotherm, specifically for thick GFRP structures.	• •	+ +	+ +	+ -	+ -	+ -
EPIKOTE Resin MGS RIMR 1035 EPIKURE Curing Agent MGS RIMH 1038	3	70	70	Fast Tg development, very low viscosity resulting in short cycle time.	• •	+ +	+ +	+ +	+ +	+ +
EPIKOTE Resin MGS RIMR 145 EPIKURE Curing Agent MGS RIMH 145 EPIKURE Catalyst MGS RIMC 145	6	120	90	Thermo latent infusion system provides full impregnation in thick (> 40mm) C-fiber laminates, compressive strength on CFRP are at pre-preg level.	• • •	+ + +	+ + +	+ + +	- - +	+ + +
RTM Systems										
EPIKOTE Resin 862 EPIKURE Curing Agent 3402	20	80	160	Approved and certified systems for various military applications, requires post cure.	• •	+ +	+ +	+ +	+ +	+ +
EPIKOTE Resin 04695/1 EPIKURE Curing Agent 05357	20	90	100	Automotive surface parts, class A surface, good carbon fibre wetting, short cycle time.	• •	+ +	+ +	+ +	+ +	+ +
High Performance RTM Systems										
EPIKOTE Resin 05475 EPIKURE Curing Agent 05500	2	115	110	Automotive structural parts and panels, very short cycle time, cure time less than 2 minutes, excellent thermal and mechanical properties. This system can be combined with Internal Mold Release Additive Heloxy 112.	• •	+ +	+ +	+ +	+ +	+ +
EPIKOTE Resin 05475 EPIKURE Curing Agent 05443	5	120	110	Automotive structural parts and panels, very short cycle time, cure time less than 5 minutes, excellent thermal and mechanical properties. This system can be combined with Internal Mould Release Heloxy Additive 112.	• •	+ +	+ +	+ +	+ +	+ +
EPIKOTE System 600	60 + 300	120 + 180	180	High performance, requires post cure, standard RTM system in aeronautical. Requires post cure.	•	+	+	-	-	-
EPIKOTE Resin 496 EPIKURE Curing Agent 385	60 + 300	120 + 180	180	Two component version of Epikote System 600. This system is globally available.	+ +	+ +	+ +	+ +	+ +	+ +
EPIKOTE Resin MGS RIMR 9000 EPIKURE Curing Agent RIMH 9180	>24	20 - 80	160	Tooling system for complex of high Tg molds, excellent mechanical and chemical performance.	•	+	+	+	+	+
Phenolic Resin System										
EPONOL Resin 2509 EPONOL Resin 2501/B	120	80	80	Low viscosity, flame retardant, excellent surface.	• •	+ +	+ +	- -	+ -	- -
Cellobond Phenolic Resin J2027X Phencat Catalyst 382	60 + 180	60 - 80	-	Low viscosity, flame retardant, excellent surface, long potlife allows injection into warm tools.	+ +	+ +	+ +	+ +	+ +	+ +

• listed, non-excluding polymers, **+** listed, **-** not listed

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