

# HexFlow® RTM651

One-part Modified BMI Resin

## Product Data

### Description

HexFlow® RTM651 is a one-component modified bismaleimide for resin transfer molding (RTM). Upon heating to 212-248°F the resin will become a low viscosity homogeneous liquid that has a long pot-life and processes easily. Postcure can be carried out free standing. HexFlow® RTM651 is a premixed bismaleimide system for service temperature to 450°F.

### Features

- Monocomponent system
- High glass transition temperature (545°F)
- Excellent elevated temperature properties
- Easy to process
- Free standing postcure
- Short, simple cure cycles

### Neat Resin Properties

Specific gravity	1.25
T <sub>g</sub> dry	545°F (DMA, E" Peak)
T <sub>g</sub> wet	426°F (DMA, E" Peak)
Fracture toughness, K <sub>1C</sub>	955 psi $\sqrt{\text{in}}$

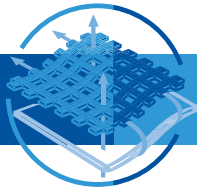
### Shelf Life

Shelf life at 0°F	1 year
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### Pot Life

Temperature (°F)	Viscosity	
	0 Hour	1 Hour
230	80 cps	120 cps
248	50 cps	67 cps

Minimum viscosity 15 cps at 313°F



## Resin Mechanical Properties

Property	Temp (°F)	Condition	Results
Tensile strength, ksi	RT	Dry	10.5
Tensile modulus, msi	RT	Dry	0.591
Tensile strain, %	RT	Dry	2.19
Flexural strength, ksi	RT	Dry	20.4
Flexural modulus, msi	RT	Dry	0.612
Flexural strength, ksi	350	Dry	15.8
Flexural modulus, msi	350	Dry	0.455

## Laminate Mechanical Properties

RTM651/3K 193 gsm PW STD MOD Carbon	Test Coupon Conditioning	Test Temp (°F)	UOM	Results
Tension 0° *	Dry	73	Strength ksi Modulus msi	114.5 9
Open Hole Tension */**	14 days H <sub>2</sub> O 158°F	347	Strength ksi	42.2
	14 days H <sub>2</sub> O 158°F	374	Strength ksi	43.2
	158°F 85%RH sat	347	Strength ksi	41.5
	158°F 85%RH sat	374	Strength ksi	41.8
In Plane Shear *	Dry	73	Strength ksi Modulus msi	6.9 0.7
	14 days H <sub>2</sub> O 158°F	347	Strength ksi Modulus msi	9.4 0.43
	158°F 85%RH sat	347	Strength ksi Modulus msi	9.4 0.47
ILSS	Dry	73	Strength ksi	8.4
	14 days H <sub>2</sub> O 158°F	347	Strength ksi	4.8
	158°F 85%RH sat	347	Strength ksi	5.4

Laminates were cured and postcured per recommended cure cycle.

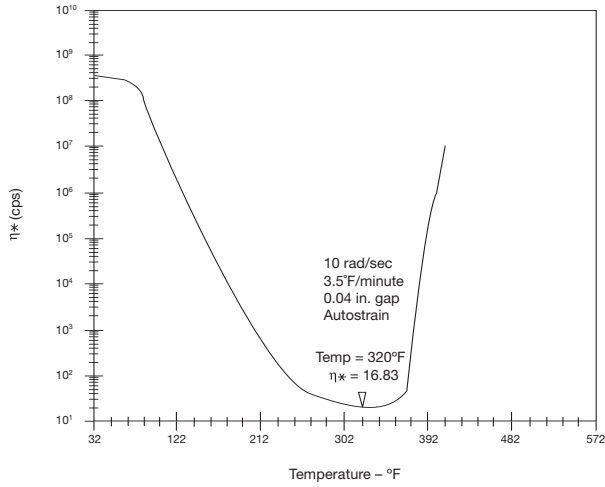
\* Nominal cured ply thickness = 0.008 inches

\*\* Width = 1.42 inches

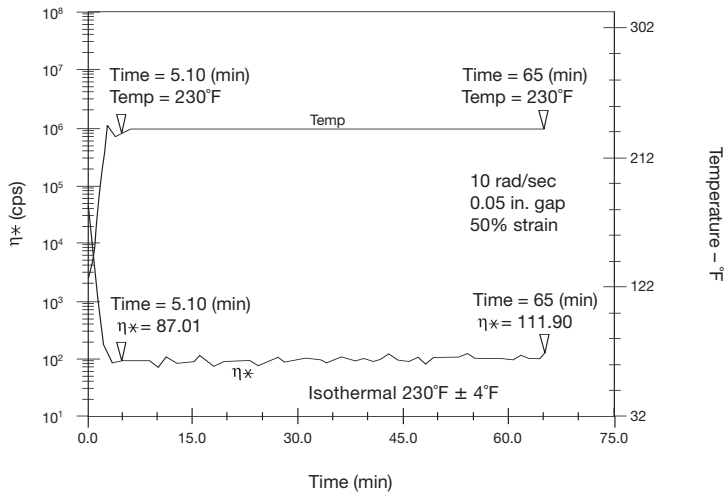
Note: Fiber used – Tenax HTA 3K

## Viscosity Profiles

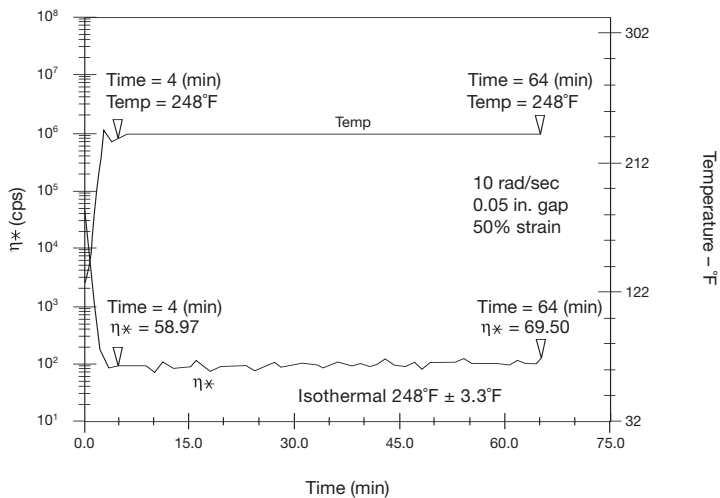
### Dynamic Viscosity Analysis



### Isothermal Viscosity Analysis – 230°F



### Isothermal Viscosity Analysis – 248°F





## Gel Time

Temperature (°F)	302	320	351	392
Gel Time (min)	98	62	23	5

Gel time measured on a hot plate

## HexFlow® RTM651 Injection Conditions

- Preheat resin to 230°F
- Preheat mold to 300°F
- Heated transfer lines should be used, 230°F recommended
- Inject the resin into the mold at 30-45 psi (minimum)

## Cure Cycle

4 hours at 375°F, 85 psi optimal, 45 psi minimum

## Postcure Cycle

A postcure is required to achieve the glass transition temperature and at-temperature properties shown in chart. Typical postcure of 16 hours at 450°F or 6-8 hours at 475°F, free standing.

Ramp temperature from ambient to 375°F at a rate of 5-10°F/minute and at a rate of 1-2°F/minute above 375°F.

## Shipping

HexFlow® RTM651 can be shipped in bulk and wrapped in polyethylene or it may be shipped in metal pails. Please specify your preference when ordering.

## Handling and Safety Precautions

Hexcel recommends that customers observe established precautions for handling resins and fine fibrous materials. Operators working with this product should wear clean, impervious gloves to reduce the possibility of skin contact and to prevent contamination of the material.

Material Safety Data Sheets (MSDS) have been prepared for all Hexcel products and are available to company safety officers on request from the nearest Hexcel Sales Office.

## Important

Hexcel Corporation believes, in good faith, that the technical data and other information provided herein is materially accurate as of the date this document is prepared. Hexcel reserves the right to modify such information at any time. The performance values in this data sheet are considered representative but do not and should not constitute specification minima. The only obligations of Hexcel, including warranties, if any, will be set forth in a contract signed by Hexcel or in Hexcel's then current standard Terms and Conditions of Sale as set forth on the back of Hexcel's Order Acknowledgement.

## For more information

Hexcel is a leading worldwide supplier of composite materials to aerospace and other demanding industries. Our comprehensive product range includes:

- Carbon Fiber
- RTM Materials
- Honeycomb Cores
- Continuous Fiber Reinforced Thermoplastics
- Carbon, Glass, Aramid and Hybrid Prepregs
- Structural Film Adhesives
- Honeycomb Sandwich Panels
- Special Process Honeycombs
- Reinforced Fabrics

For US quotes, orders and product information call toll-free 1-800-688-7734. For other worldwide sales office telephone numbers and a full address list please click here: <http://www.hexcel.com/contact/salesoffices>.