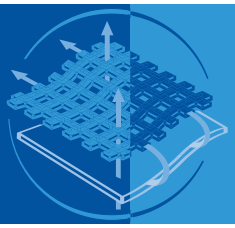


HexFlow® RTM651

One-part Modified BMI Resin

Product Data

Description

HexFlow® RTM651 is a one-component modified bismaleimide for resin transfer moulding (RTM). Upon heating to 100-120°C 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 232°C.

Features

- Monocomponent system
- High glass transition temperature (285°C)
- Excellent elevated temperature properties
- Easy to process
- Free standing postcure
- Short, simple cure cycles

Neat Resin Properties

Specific gravity	1.25
T_g dry	285°C (DMA, E" Peak)
T_g wet	219°C (DMA, E" Peak)
Fracture toughness, K_{1C}	1.05 MPa $\sqrt{m}$

Shelf Life

Shelf life at –18°C	1 year

Pot Life

Temperature (°C)	Viscosity	
	0 Hour	1 Hour
110	80 mPas	120 mPas
120	50 mPas	67 mPas

Minimum viscosity 15 mPas at 156°C

Resin Mechanical Properties

Property	Temp (°C)	Condition	Results
Tensile strength, MPa	RT	Dry	72.4
Tensile modulus, GPa	RT	Dry	4.08
Tensile strain, %	RT	Dry	2.19
Flexural strength, MPa	RT	Dry	141
Flexural modulus, GPa	RT	Dry	4.22
Flexural strength, MPa	177	Dry	109
Flexural modulus, GPa	177	Dry	3.14

HEXCEL®

Laminate Mechanical Properties

RTM651/3K 193 gsm PW STD MOD Carbon	Test Coupon Conditioning	Test Temp (ºC)	UOM	Results
Tension 0˚ *	Dry	23	Strength MPa Modulus GPa	782 62.3
Open Hole Tension */**	14 days H_20 70˚C	175	Strength MPa	291
	14 days H_20 70˚C	190	Strength MPa	298
	70˚C 85%RH sat	175	Strength MPa	286
	70˚C 85%RH sat	190	Strength MPa	288
In Plane Shear *	Dry	23	Strength MPa Modulus GPa	87.3 4.89
	14 days H_20 70˚C	175	Strength MPa Modulus GPa	65 2.96
	70˚C 85%RH sat	175	Strength MPa Modulus msi	65 3.23
ILSS	Dry	23	Strength MPa	58.1
	14 days H_20 70˚C	175	Strength MPa	33.2
	70˚C 85%RH sat	175	Strength MPa	37.5

Laminates were cured and postcured per recommended cure cycle.

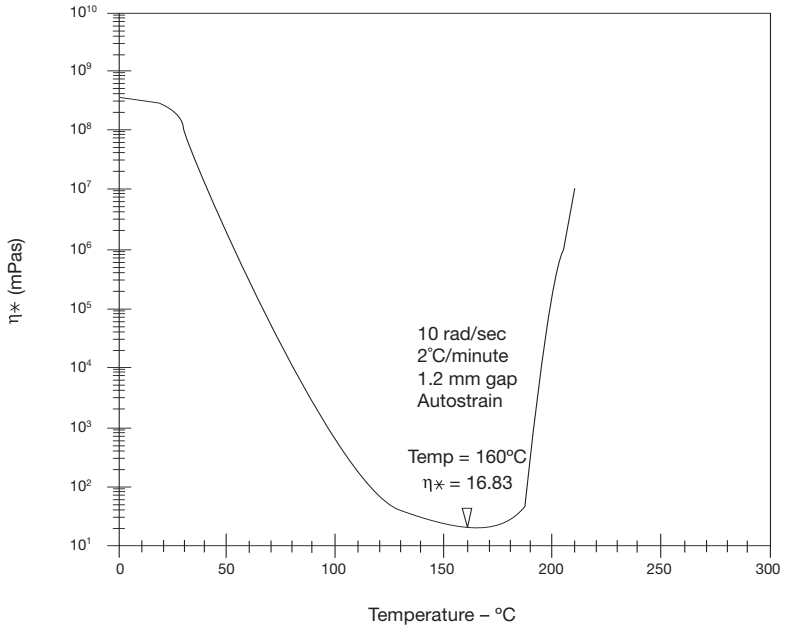
* Nominal cured ply thickness = 0.21 mm

** Width = 36 mm

Note: Fibre used – Tenax HTA 3K

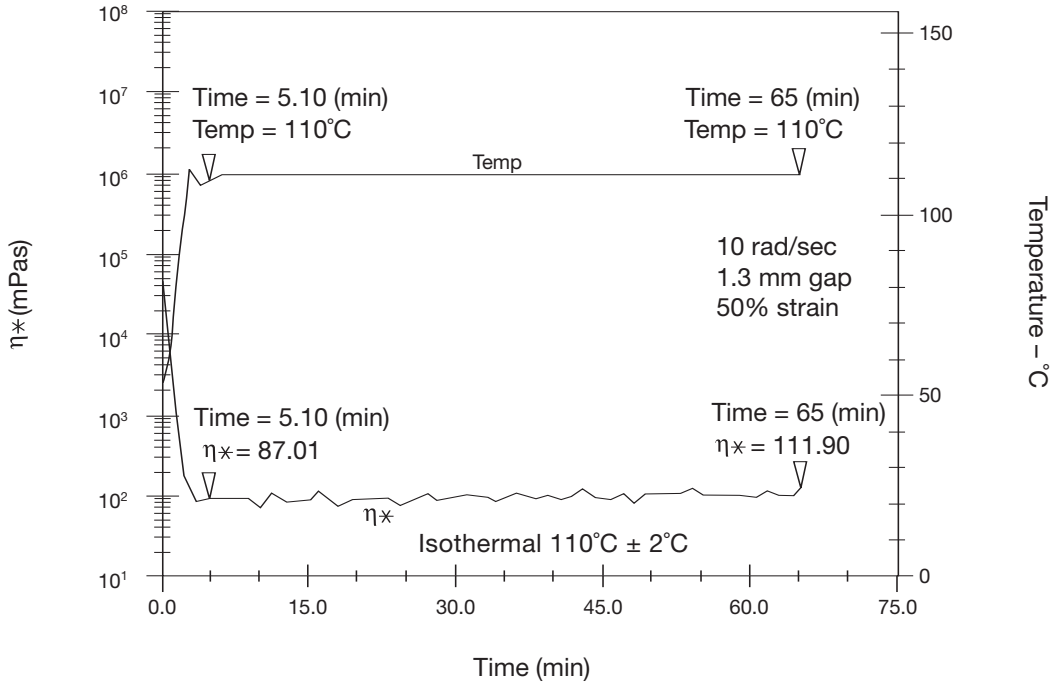
Viscosity Profiles

Dynamic Viscosity Analysis

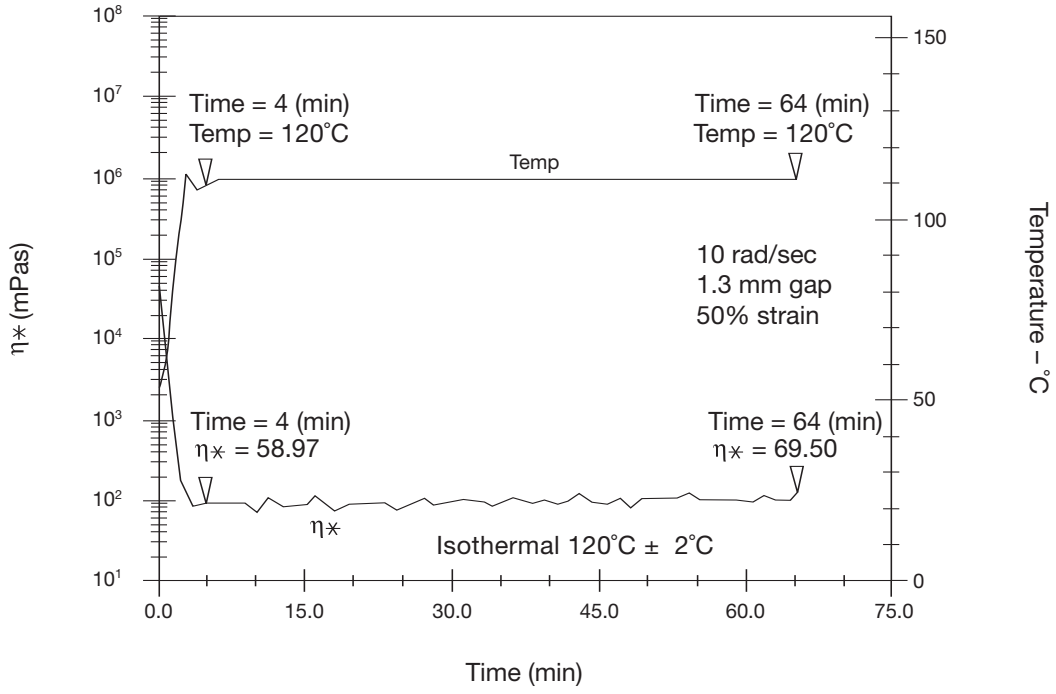


Viscosity Profiles cont.

Isothermal Viscosity Analysis – 110°C



Isothermal Viscosity Analysis – 120°C



HexFlow® RTM651 *Product Data*

Gel Time

Temperature (ºC)	150	160	177	200
Gel Time (min)	98	62	23	5

Gel time measured on a hot plate

HexFlow® RTM651 Injection Conditions

- Preheat resin to 110°C
- Preheat mould to 150°C
- Heated transfer lines should be used, 110°C recommended
- Inject the resin into the mould at 2-3 bars (minimum)

Cure Cycle

4 hours at 191ºC, 5.86 bars optimal, 3.10 bars 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 232ºC or 6-8 hours at 245ºC, free standing.

Ramp temperature from ambient to 191˚C at a rate of 3-6˚C/minute and at a rate of 0.6-1.2˚C/minute above 191˚C.

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.

For more information

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

- Carbon Fibre
- RTM Materials
- Honeycomb Cores
- Continuous Fibre 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**.