



BMI-1SC

Bismaleimide Prepreg

Introduction

BMI-1SC prepreg resin system is designed for use in high temperature tooling or components. It has been formulated to give very high service temperatures without compromising performance and may provide extended tool life compared to lower Tg alternates.

Typical applications: *high service temperature, high stability tooling*

Key Features & Benefits

- Good handling characteristics
- Cure temperature: **185°C (365°F)**
- Potential Tg up to **350°C (662°F)** after post-cure
- Low CTE and shrinkage
- Work life at 20°C (70F): **30 days**
- Storage life at -18°C (0F): **24 months**
- Processable in **autoclave**. Press or oven may be possible depending on requirements, please contact SHD Composites for more information.

Storage & Out Life

This material should be kept frozen at -18°C (-1°F). It must be kept sealed in a polythene bag which must not be opened until fully thawed to room temperature. If the material is not fully used, then the material must be resealed in the polythene bag to prevent moisture absorption.



Cure Cycles & performances

Recommended cure cycle:

- Ramp up to 100°C (212°F) at 2°C/min (3.6°F/min) under vacuum only
- Apply 6 bar pressure and remove vacuum
- Ramp up to 140°C (284°F)⁽¹⁾ at 2°C/min (3.6°F/min) and hold 140°C (284°F)⁽¹⁾ for 1hr
- Ramp up to 185°C (374°F)⁽¹⁾ at 2°C/min (3.6°F/min) and hold 190°C (374°F)⁽¹⁾ for 2hrs
- Cool down below 60°C (140°F) before removing for post-cure

⁽¹⁾ ±5°C (±5°F)

Recommended post cure cycles:

Option 1:

- Ramp up to 220°C (428°F) at 0.3°C/min (0.54°F/min)
- Hold 220°C (428°F) for 2hrs

Resulting Tg:

235°C (464°F)

Option 2:

- Ramp up to 260°C (500°F) at 0.3°C/min (0.54°F/min)
- Hold 260°C (500°F) for 2hrs

Resulting Tg:

350°C (662°F)

- Curing Schedule is meant to be a guide only and is subject to local conditions.
- To avoid exotherm particular care must be taken with thick laminates.
Ramp rates must not exceed **3.0°C (5.4°F)** per minute during **initial cure**.
Ramp rates must not exceed **0.3°C (0.54°F)** per minute during **post cure** (free standing).



Cured Material Properties

SURFACE PLY: **200gsm 3k, 43% resin weight**

Material description: *BMI-1SC-C200T-HS-3K-43%RW-1250 (SHD2251-1250)*

Test	Results			Standard
Vf	Fibre volume fraction	49.08	%	<i>BS EN ISO 14127 Method B</i>
CPT	Cured ply thickness	0.238	mm	<i>BS EN ISO 14127 Method B</i>
Tensile 0°	Tensile strength	609	MPa	<i>BS EN ISO 527-4</i>
	Tensile modulus	55.2	GPa	
	Poisson's ratio	0.07		
Tensile 90°	Tensile strength	665	MPa	
	Tensile modulus	55.5	GPa	
	Poisson's ratio	0.06		
Compressive 0°	Compressive strength	874	MPa	<i>prEN 2850 Type B</i>
	Compressive modulus	52.7	GPa	
Compressive 90°	Compressive strength	869	MPa	
	Compressive modulus	51.0	GPa	
Flexural 0°	Flexural strength	783	MPa	<i>BS EN ISO 14125</i>
	Flexural modulus	55.3	GPa	
Flexural 90°	Flexural strength	776	MPa	
	Flexural modulus	54.1	GPa	
In-Plane Shear ±45°	In-Plane shear strength (ultimate)	101.2	MPa	<i>BS EN ISO 14129</i>
	In-Plane shear modulus	4.49	GPa	
Interlaminar Shear 0°	Interlaminar shear strength	78.4	MPa	<i>BS EN ISO 14130</i>
Interlaminar Shear 90°	Interlaminar shear strength	84.5	MPa	
DMA – Dry Tg	Tg E' Onset	244	°C	<i>Modified ASTM D7028 (Single Cantilever)</i>
	Tg Peak Tan δ	280	°C	

Cure schedule: see "recommended cure cycle" and "recommended post-cure cycle, option 1" on page 2. All figures in this table are actual test results and have not been normalised. Complete test reports can be supplied independently upon request.



BULK PLY: **416gsm 6k, 36% resin weight**

Material description: *BMI-1SC-C416T-HS-6K-36%RW-1250 (SHD2852-1250)*

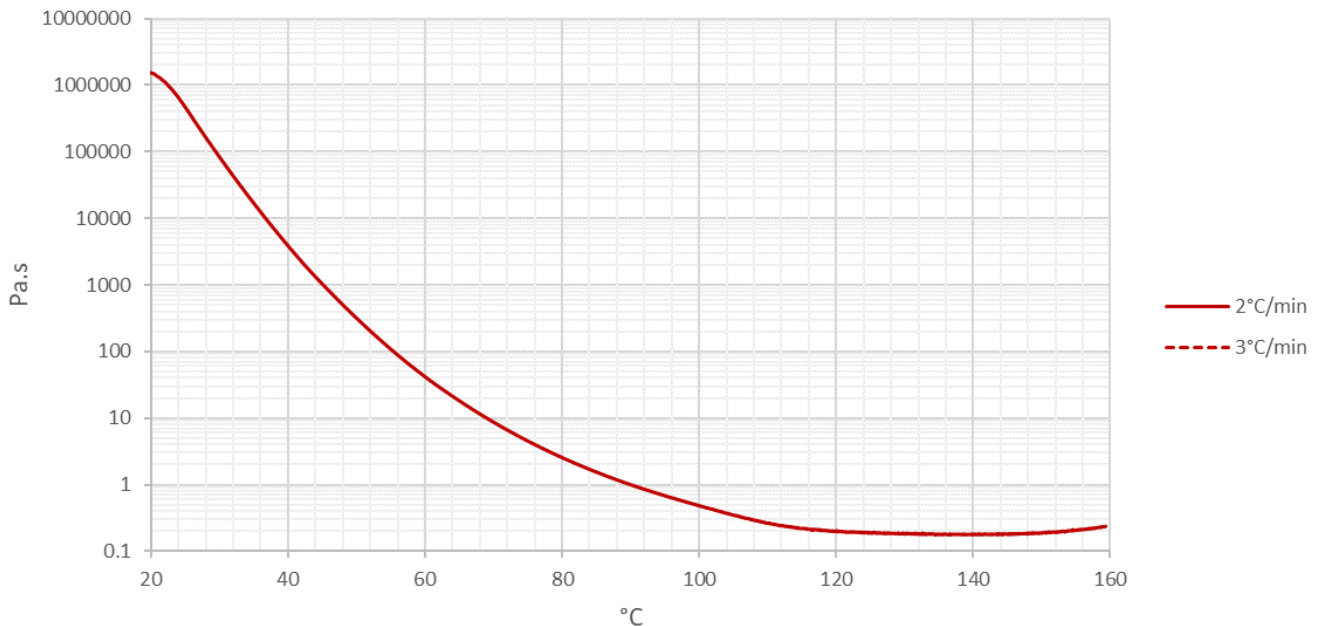
Test	Results			Standard
Vf	Fibre volume fraction	55.04	%	<i>BS EN ISO 14127 Method B</i>
CPT	Cured ply thickness	0.421	mm	<i>BS EN ISO 14127 Method B</i>
Tensile 0°	Tensile strength	620	MPa	<i>BS EN ISO 527-4</i>
	Tensile modulus	63.9	GPa	
	Poisson's ratio	0.06		
Tensile 90°	Tensile strength	580	MPa	
	Tensile modulus	63.2	GPa	
	Poisson's ratio	0.05		
Compressive 0°	Compressive strength	998	MPa	<i>prEN 2850 Type B</i>
	Compressive modulus	59.0	GPa	
Compressive 90°	Compressive strength	998	MPa	
	Compressive modulus	58.5	GPa	
Flexural 0°	Flexural strength	831	MPa	<i>BS EN ISO 14125</i>
	Flexural modulus	59.0	GPa	
Flexural 90°	Flexural strength	827	MPa	
	Flexural modulus	58.8	GPa	
In-Plane Shear ±45°	In-Plane shear strength (ultimate)	91.6	MPa	<i>BS EN ISO 14129</i>
	In-Plane shear modulus	5.10	GPa	
Interlaminar Shear 0°	Interlaminar shear strength	79.1	MPa	<i>BS EN ISO 14130</i>
Interlaminar Shear 90°	Interlaminar shear strength	76.2	MPa	
DMA – Dry Tg	Tg E' Onset	239	°C	<i>Modified ASTM D7028 (Single Cantilever)</i>
	Tg Peak Tan δ	274	°C	

Cure schedule: see "recommended cure cycle" and "recommended post-cure cycle, option 1" on page 2. All figures in this table are actual test results and have not been normalised. Complete test reports can be supplied independently upon request.



Viscosity Profile

Measured using a rotational rheometer



Health and Safety

This material contains resin which can cause allergic reactions with skin contact and must avoid repeated and prolonged skin contact.

Please refer to the product Safety Data Sheet before using this material. The following precautions must be taken when using epoxy resin prepregs:

- Overalls must be worn.
- Impervious gloves must be worn.
- Curing schedule is meant to be as a guide only and is subject to local conditions.
- To avoid exotherm, particular care must be taken with thick laminates.

Disclaimer: Technical advice, instruction, data or recommendation, whether verbal or in writing, is given in good faith. The SHD company providing any such advice gives no warranty or guarantee, whether express or implied, in relation to such advice.

Customers must carry out their own tests and assessments as necessary in order to determine the quality and suitability of the product for their particular application and circumstances. Such testing should be performed under conditions identical to those to which the final component/product may be subjected. Values listed in any SHD document are for typical properties of the product or substance in question and are not intended to be used in establishing either statistical specifications nor engineering basis values. They do not constitute either minimum or maximum values for the product or substance in question.