

## GMS EP-250 PREPREG

### Product

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GMS Composites EP-250 is a formulated epoxy resin matrix prepreg, designed for high temperature resistant composite tooling applications. The product can be cured at temperatures, down to 55°C. This enables the tool to gel and be demoulded from a low temperature plug or model, before continuing to cure the free standing tool up to 200°C. The EP-250 has excellent mechanical properties after low temperature cure. The EP-250 prepreg has good tack and flow. EP-250 is available in a range of substrates such as carbon, glass or aramid.

### Applications

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EP-250 can be used to produce high temperature resistant composite tools with carbon, glass or aramid fibres. The versatility of EP-250, means large complex tools as well as small basic components can be produced. The EP-250 prepreg can be used to take splashes from existing parts, that have been properly prepared, for repair or reverse engineering applications.

### Features

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- ◆ **Low temperature initial cure from 55°C**
- ◆ **Free standing post cure**
- ◆ **Good surface finish**
- ◆ **Suitable for a range of tools**
- ◆ **Excellent shelf life**
- ◆ **Wide range of fibre substrates available**
- ◆ **Made in Australia**

## **Curing**

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The cure cycle for EP-250, listed below, is a guide only.  
It is recommended the customer trials their own cure cycle depending on the size and complexity of the tool.

### **Initial Cure**

Apply a minimum of 26 inches of Hg vacuum  
Apply 6 bar of autoclave pressure. Vacuum may be vented at 1 bar if desired.  
Heat laminate at a rate of 0.5 -1.0°C / min. until a cure temperature of 65 – 70°C  
Hold the laminate at 65-70°C for a dwell time of 24 hours  
Cool the laminate under pressure to 30°C at 3°C

### **Post Cure**

Heat at 1-2°C / min to 60°C and hold for 2hrs  
Heat at 1-2°C / min to 100°C and hold for 2hrs  
Heat at 1-2°C / min to 140°C and hold for 2hrs  
Heat at 1-2°C / min to 180°C and hold for 2hrs  
Heat at 1-2°C / min to 200°C and hold for 5hrs  
Cool to room temperature at a rate of 3°C / min

or

Heat at 1-2°C / min to 60°C  
Heat at 10°C hour to 200°C and hold for 5 hours  
Cool to room temperature at a rate of 3°C / min

## Gel Time

Hot plate

Temperature (°C)	Time (min)
50	1000
60	560 - 580
90	75 – 80
100	40 – 45
120	10 – 15

Values are indicative of small samples of neat resin formulation. Gel times may vary significantly in composites depending on fibre content and laminate thickness.

## Properties

Properties of cured, neat formulation. 24hrs @ 65°C + 2hrs @ 120°C + 2hrs @ 160°C + 2hrs @ 200°C	Unit	Value
Flexural Strength (at 23°C)	MPa	60 - 70
Ultimate Elongation (at 23°C)	%	1.5 – 2.0
Flexural Modulus (at 23°C)	MPa	3300 - 3400
Tensile Strength (at 23°C)	MPa	28 - 30
Ultimate Elongation (at 23°C)	%	0.8 – 1.0
Tensile Modulus (at 23°C)	MPa	3200 - 3300
Tg (DMA, RT - 300°C, 2°C /min)	°C	180 - 200

Glass Transition Temperature (DSC, 10K/min) after initial low temperature cure

48hrs @ 55°C	-	59 - 63°C
24hrs @ 65°C	-	76 - 83°C

Properties of cured formulation.	Unit	Value
<b>12 layers 92146 Interglas / 3.2mm</b>		
<b>48hrs @ 55°C</b>		
Flexural Strength (at 23°C)	MPa	900 - 950
Ultimate Elongation (at 23°C)	%	1.8 – 2.1
Flexural Modulus (at 23°C)	MPa	42800 - 43200
Interlaminar shear strength	Mpa	50 - 52
<b>24hrs @ 65°C</b>		
Flexural Strength (at 23°C)	MPa	750 - 850
Ultimate Elongation (at 23°C)	%	2.3 – 2.4
Flexural Modulus (at 23°C)	MPa	35000 - 36000
Interlaminar shear strength	Mpa	58 - 62
<b>24hrs @ 65°C + 2hrs @ 120°C + 2hrs @ 160°C + 2hrs @ 200°C</b>		
Flexural Strength (at 23°C)	MPa	750 - 850
Ultimate Elongation (at 23°C)	%	2.1 – 2.5
Flexural Modulus (at 23°C)	MPa	33000 - 35000
Interlaminar shear strength	Mpa	52 - 57
Tg (DMA, RT - 300°C, 2°C /min)	°C	175 - 205

Properties of cured formulation.	Unit	Value
<b>12 Layers G1157 UD carbon / 3.2mm</b>		
<b>24hrs @ 65°C + 2hrs @ 120°C + 2hrs @ 160°C + 2hrs @ 200°C</b>		
Flexural Strength (at 23°C)	MPa	950 - 1100
Ultimate Elongation (at 23°C)	%	1.4 – 1.6
Flexural Modulus (at 23°C)	MPa	67000 - 73000
Interlaminar shear strength	Mpa	70 - 76
Tg (DMA, RT - 300°C, 2°C /min)	°C	185 - 210

### Shelf Life

Room temperature (23°C)	> 3 weeks
Refrigerated (-18°C)	12 months

## Handling

Customers should ensure appropriate workplace OH&S guidelines are followed when working with this product. Appropriate measures should be taken to avoid contact with skin and eyes. Avoid inhalation of dust or fumes that may be released or created when machining, cutting or curing.

### IMPORTANT

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