EP 121

EPOXY PREPREG CO-CURABLE WITH PHENOLICS

- Highly toughened and self-extinguishing resin system
- Improved hot/wet stability
- Controlled resin flow
- Suitable for co-curing with phenolic novolac systems such as PF801
- Excellent adhesion to core materials
- Shop life of 15 days at room temperature, 21ºC (70ºF)

INTRODUCTION

EP 121 prepreg material has been developed for the realisation of extremely light-weight composite structures with high specific mechanical properties, good impact properties and excellent adhesion to honeycomb cores and metallic substrates.

For several applications, the resin system is coloured in “mouse grey” according to AIRBUS DAN 1200 2.5 to save on painting costs. The prepreg is also available in a natural colour.

The resin matrix EP 121 is a 125ºC (257ºF) system, which can be cured at a temperature range between 120ºC and 160ºC (248ºF and 320ºF).

Both monolithic and sandwich structures can be easily manufactured with this prepreg. The curing can be performed by press, vacuum bag and autoclave moulding with a pressure of at least 0.7 bar / 10 psi.

Such composite structures can be exposed easily to temperatures in the range of -55ºC (-67ºF) up to +90ºC (194ºF).

The prepreg material is suitable for:

- Aviation and aerospace industries
- Machine industries
- Marine and automotive applications
- Sporting goods

PRODUCT INFORMATION

EP 121 epoxy prepreg is available in a range of product formats. Please consult your local sales contact for further information. Full contact details can be found at www.gurit.com.

PROPERTY	EP 121-G218-50	EP 121-C15-53	EP 121-68-40	TEST STANDARD
Resin	Epoxy	Epoxy	Epoxy	-
Prepreg Weight	380 ± 15 g/m²	410 ± 15 g/m²	495 ± 15 g/m²	EN 2557
Volatile	< 1.5 %	< 1.5 %	< 1.5 %	EN 2330 / EN2558
Resin Flow	15 - 25 %	15 - 25 %	> 10 %	EN 2332 / EN 2560
Tackiness	medium to high	T1	low,medium or high	-
Fibre Material	S2-glass	3k HTA	E-glass	EN 2559
Fabric Weight	190 g/m² ± 5 %	193 g/m² ± 5 %	296 g/m² ± 5 %	-
Weave Style	8H satin	Plain weave	8H satin	-
Service Temperature (Cured State)	-55ºC to +90ºC (-67ºF to +90ºF)			-
Resin Content	50.0 ± 3 %	53.0 ± 3 %	40.0 ± 3%	EN 2559
Typical Roll Length	50 m / 55 yd	Up to 177 m / 194 yd	50 m / 55 yd	-
Typical Roll Width	1.45 m / 57 in	1.55 m / 61 in	1.0 m / 39 in	-

PREPREG PROPERTIES

TRANSPORT & STORAGE

When stored sealed & out of direct sunlight.

All prepreg materials should be stored in a freezer when not in use to maximise their useable life, since the low temperature reduces the reaction of resin and catalyst to virtually zero. However, even at -18°C (0°F), the temperature of most freezers, some reaction will still occur. In most cases after some years, the material will become unworkable.

STORAGE TEMP		UNIT	VALUE
-18°C	0°F	months	6
+21°C	+70°F	days	15

HEALTH AND SAFETY

Please refer to product SDS for up to date information specific to this product.

QUALIFICATIONS / FIRE PERFORMANCE

PRODUCT	QUALIFICATIONS	FIRE PERFORMANCE
EP 121-G218-50	¬ ABS 5672-04 ¬ AIMS 05-10-035 B (certification)	¬ FAR 25.853 Flame Test (self-extinguishing) ¬ AITM 2.0002 (Airbus)
EP 121-C15-53	¬ ABS 5003 ¬ AIMS 05-10-016 (certification)	¬ FAR 25.853 Flame Test (self-extinguishing) ¬ AITM 2.0002 (Airbus)
EP 121-68-40	¬ WL 5.3200 B1.2 ¬ WL 8.4568.6	¬ FAR 25.853 Flame Test (self-extinguishing) ¬ LTF 1500-850, BV 11

CURING CONDITIONS

PROPERTY	STANDARD CURE			TEST STANDARD
Cure Process	Press / Autoclave / Vacuum-bag			-
Cure Pressure	0.7 – 4 bar / 10 – 58 psi			-
Heat-up Ramp Rate	Max 3ºC / 5.4ºF per min			-
Dwell Temperature	120ºC / 248ºF	135ºC / 275ºF	155ºC / 311ºF	-
Dwell Time	90 min	70 min	35 min	-
Cool-down Ramp Rate	4ºC per min / 7.2ºF per min			-
Remove material at	< 60ºC / 140ºF			-

LAMINATE PROPERTIES

All data presented in this datasheet is based on the mechanical testing of a single batch of material.

MECHANICAL PROPERTIES AT ROOM TEMPERATURE (21ºC / 70ºF)

PROPERTY	SYMBOL	EP 121-G218-50		EP 121-C15-53		EP 121-68-40		TEST STANDARD
0º Flexural Strength	X_F	-	-	950 MPa	138 ksi	-	-	ISO 178
0º Flexural Modulus	E_{F11}	-	-	50 GPa	7.3 msi	-	-	ISO 178
0º Tensile Strength	X_T	620 MPa	90 ksi	850 MPa	123 ksi	430 MPa	62 ksi	ISO 527-4
0º Tensile Modulus	E_{T11}	24 GPa	3.5 msi	55 GPa	8.0 msi	21 GPa	3.1 msi	ISO 527-4
0º Compressive Strength	X_C	600 MPa	87 ksi	500 MPa	73 ksi	450 MPa	65 ksi	EN 2850
0º Compressive Modulus	E_{C11}	22 GPa	3.2 msi	50 GPa	7.3 msi	22 GPa	3.2 msi	EN 2850
0º Interlaminar Tensile Shear Strength	X_{ILTSS}	35 MPa	5.1 ksi	-	-	35 MPa	5.1 ksi	AITM 1.0019
0° Interlaminar Shear Strength	X_{ILSS}	40 MPa	5.8 ksi	50 MPa	7.3 ksi	45 MPa	6.5 ksi	EN 2377
Climbing Drum Peel*	σ_{PEEL}	275 N/75mm		260 N/75mm		200 N/75mm		EN 2243-3
Bending Load	$F_{BENDING}$	1400 N		1600 N		1700 N		AITM 1.0018
Glass Transition Temperature	Tg	125ºC	257ºF	125ºC	257ºF	125ºC	257ºF	ISO 6721 (DMA)

**sandwich structure: 2 plies per side; core 3.2-48kg/m³ 9.4mm (honeycomb)*

MECHANICAL PROPERTIES AT 80ºC (176ºF)

PROPERTY	SYMBOL	EP 121-G218-50		EP 121-C15-53		EP 121-68-40		TEST STANDARD
0º Flexural Strength	X_F	-	-	-	-	-	-	ISO 178
0º Flexural Modulus	E_{F11}	-	-	-	-	-	-	ISO 178
0º Tensile Strength	X_T	550 MPa	80 ksi	-	-	-	-	ISO 527-4
0º Tensile Modulus	E_{T11}	-	-	-	-	-	-	ISO 527-4
0º Compressive Strength	X_C	600 MPa	87 ksi	500 MPa	73 ksi	-	-	EN 2850
0º Compressive Modulus	E_{C11}	-	-	-	-	-	-	EN 2850
0º Interlaminar Tensile Shear Strength	X_{ILTSS}	30 MPa	4.4 ksi	-	-	30 MPa	4.4 ksi	AITM 1.0019
Interlaminar Shear Strength	X_{ILSS}	30 MPa	4.4 ksi	35 MPa	5.1 ksi	38 MPa	5.5 ksi	EN 2377
Climbing Drum Peel*	σ_{PEEL}	290 N/75mm		300 N/75mm		-		EN 2243-3
Bending Load*	$F_{BENDING}$	975 N		1100 N		1700 N		AITM 1.0018
Glass Transition Temperature	Tg	125ºC	257ºF	125ºC	257ºF	125ºC	257ºF	ISO 6721 (DMA)

**sandwich structure: 2 plies per side; core 3.2-48kg/m³ 9.4mm (honeycomb)*

BURN BEHAVIOUR

PROPERTY	EP 121-G218-50	EP 121-C15-53	EP 121-68-40	TEST STANDARD
Flammability vertical, 60s flaming – Burn length	110 mm	110 mm	<=110 mm	AITM 2.0002A
Flammability vertical, 60s flaming – After flame time	0 s	0 s	0 s	AITM 2.0002A
Flammability vertical, 60s flaming – After flame time of drips	0 s	0 s	0 s	AITM 2.0002A
Max. specific optical smoke density within 4 min	150 Ds	160 Ds	150 Ds	AITM 2.0007A
Heat Release	55 kW m^2	-		AITM 2.0006
Heat Release Rate	35 Kw*min m^2	-		AITM 2.0006
Determination of the toxic components on combustion products	-	-	10 / 160 / 10 / 0 / 0 / 10 ppm (HCN / CO / NO_X / SO_2 / HF / HCl)	AITM 3.0005 (flaming mode)

NOTICE

All advice, instruction or recommendation is given in good faith but the Company only warrants that advice in writing is given with reasonable skill and care. No further duty or responsibility is accepted by the Company. All advice is given subject to the terms and conditions of sale (the Conditions) which are available on request from the Company or may be viewed at the Company's Website: www.gurit.com/terms-and-conditions.aspx.

The Company strongly recommends that Customers make test panels and conduct appropriate testing of any goods or materials supplied by the Company to ensure that they are suitable for the Customer's planned application. Such testing should include testing under conditions as close as possible to those to which the final component may be subjected. The Company specifically excludes any warranty of fitness for purpose of the goods other than as set out in writing by the Company. The Company reserves the right to change specifications and prices without notice and Customers should satisfy themselves that information relied on by the Customer is that which is currently published by the Company on its website. Any queries may be addressed to the Technical Services Department.

Gurit are continuously reviewing and updating literature. Please ensure that you have the current version, by contacting Gurit Marketing Communications or your sales contact and quoting the revision number in the bottom right-hand corner of this page.

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