

EP 127

HIGH TG STRUCTURAL EPOXY PREPREG

- ▣ Toughened and self-extinguishing resin system
- ▣ Self-adhesive to core materials
- ▣ Excellent Mechanical Properties
- ▣ High temperature stability
- ▣ Long shelf and shop life

INTRODUCTION

EP 127 is a self-adhesive epoxy system, designed for high temperature stability up to 185°C (365°F) with a Tg of 200°C (392°F).

EP 127 prepreg material is very suitable for the manufacturing of light-weight composite components with high specific mechanical properties and has a controlled resin flow during curing and high interlaminar shear strength.

EP 127 is a sub-180°C (356°F) curing system, which can be cured at a temperature range between 130°C (266°F) and 180°C (356°F) depending on the required performance. The curing can be performed by press, vacuum and autoclave moulding with a pressure of at least 0.7 bar / 10 psi.

For increased thermal and chemical stability, the components can be subjected to a stepped free-standing post-cure up to 220°C (428°F) to achieve a glass transition temperature of 230°C (446°F).

Composite structures can be exposed to temperatures in the range of -55°C (-67°F) up to 185°C (365°F). EP 127 prepreg is suitable for following applications:

- ▣ Aerospace
- ▣ Industrial
- ▣ Automotive

PRODUCT INFORMATION

EP 127 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 127-CR508_190-35	EP 127-C20-45P	TEST STANDARD
Resin	Epoxy Cyanate Ester blend	Epoxy Cyanate Ester blend	-
Prepreg Weight	295 ± 20 g/m ²	365 ± 15 g/m ²	EN 2329
Volatile	< 1.0 %	< 1.5 %	EN 2330 (180°C / 10 min)
Resin Flow	> 8 % (4 plies, 140°C, 10min, 4 bar)	> 10 % (4 plies, 140°C, 10min, 4 bar)	EN 2332
Tackiness	Adjustable	Adjustable	-
Fibre Material	Toray T700SC 12K, DU	3k HTA	-
Fabric Weight	190 g/m ² ± 5%	204 g/m ² ± 5%	EN 2331
Weave Style	Unidirectional	Plain Weave	-
Service Temperature (Cured State)	-55°C to +200°C (-67°F to 392°F)	-55°C to +185°C (-67°F to 365°F)	-
Resin Content	35 ± 3%	45 ± 3%	EN 2331
Typical Roll Length	50 m / 55 yd	50 m / 55 yd	-
Typical Roll Width	1.0 m / 39 in	1.27 m / 50 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	12
+21°C	+70°F	days	15

HEALTH AND SAFETY

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

QUALIFICATIONS / FIRE PERFORMANCE

PRODUCT	QUALIFICATIONS	FIRE PERFORMANCE
EP 127-C20-45P	-	→ FAR 25.853 Flame Test (self-extinguishing)

CURING CONDITIONS

PROPERTY	180°C CURE	STANDARD CURE			TEST STANDARD
Cure Process	Press / Autoclave / Vacuum-Bag				-
Cure Pressure	0.7 – 7.0 bar / 10 - 101 psi				-
Heat-up Ramp Rate	Max 4°C / 7.2°F per min below 60°C / 140°F Max 3°C / 5.4°F per min above 60°C / 140°F				-
Dwell Temperature 1	90°C / 194°F	145°C / 293°F	160°C / 320°F	180°C / 356°F	-
Dwell Time 1	30 min	90 min	60 min	45 min	-
Dwell Temperature 2	115°C / 239°F	-	-	-	-
Dwell Time 2	60 min	-	-	-	-
Post-Cure Temperature	180°C / 356°F	200°C / 392°F	220°C / 428°F		-
Post-Cure Time	120 min	120 min	120 min		-
Cool-down Ramp Rate	4°C per min / 7.2°F per min				-
Remove material at	< 60°C / 140°F				-

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 (21°C / 70°F)

PROPERTY	SYMBOL	EP 127-CR508 / 190-35		EP 127-C20-45P		TEST STANDARD
0° Flexural Strength	X _F	2200 MPa	319 ksi	910 MPa	132 ksi	ISO 178
0° Flexural Modulus	E _{F11}	120 GPa	17.4 msi	49 GPa	7.11 msi	ISO 178
0° Tensile Strength	X _T	1650*** MPa	239*** ksi	760 MPa	110 ksi	ISO 527-4
0° Tensile Modulus	E _{T11}	140*** GPa	20.3*** msi	59 GPa	8.56 msi	ISO 527-4
0° Compressive Strength	X _C	-	-	800 MPa	116 ksi	EN 2850
0° Compressive Modulus	E _{C11}	-	-	48 GPa	6.96 msi	EN 2850
±45° In-Plane Shear Strength	τ ₁₂			104 MPa	15 ksi	EN 14129
±45° In-Plane Shear Modulus	G ₁₂			4.0 GPa	0.58 msi	EN14129
0° Interlaminar Shear Strength	X _{ILSS}	105 MPa	15 ksi	74 MPa	11 ksi	DMS 2144
Climbing Drum Peel*	σ _{PEEL}	-		> 130 N/75mm		EN 2243-3
Bending Load	F _{BENDING}	-		-		AITM 1.0018
Compression After Impact	CAI – 0 J	-	-	222 MPa	32 ksi	AITM 1-0010
Compression After Impact	CAI – 10 J	-	-	201 MPa	29 ksi	AITM 1-0010
Compression After Impact	CAI – 30 J	-	-	167 MPa	24 ksi	AITM 1-0010
Compression After Impact	CAI – 50 J	-	-	145 MPa	21 ksi	AITM 1-0010
Glass Transition Temp.	T _{g1}	> 145°C	> 293°F	200°C	392°C	ISO 6721 (DMA)
Glass Transition Temp. (200°C / 120min Post-Cure)	T _{g1}	210°C	410°F	-	-	ISO 6721 (DMA)
Glass Transition Temp. (220°C / 120min Post-Cure)	T _{g1}	230°C	446°F	-	-	ISO 6721 (DMA)
HW** Glass Transition Temperature	T _{g1HW}	-	-	160°	320°F	ISO 6721 (DMA)

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

**HW – Hot-Wet, soaked in distilled water 98°C (208°F) for 24 hours.

***Normalized to 60% volume of fibre fraction

MECHANICAL PROPERTIES AT ELEVATED TEMPERATURE

PROPERTY	SYMBOL	EP 127-CR508/190-35		EP 127-C20-45P						TEST STANDARD
Test Temperature	T	70°C	158°F	90°C	194°F	120°C	248°F	120°C HW*	248°F HW*	
0° Flexural Strength	X _F	-	-	850 MPa	123 ksi	840 MPa	122 ksi	710 MPa	103 ksi	ISO 178
0° Flexural Modulus	E _{F11}	-	-	48 GPa	6.96 msi	47 GPa	6.82 msi	47 GPa	6.82 msi	ISO 178
0° Tensile Strength	X _T	-	-	750 MPa	109 ksi	710 MPa	103 ksi	660 MPa	96 ksi	ISO 527-4
0° Tensile Modulus	E _{T11}	-	-	58 GPa	8.41 msi	58 GPa	8.41 msi	-	-	ISO 527-4
0° Compressive Strength	X _C	-	-	740 MPa	107 ksi	710 MPa	103 ksi	600 MPa	87 ksi	EN 2850
0° Compressive Modulus	E _{C11}	-	-	43 GPa	6.24 msi	41 GPa	5.95 msi	40 GPa	5.80 msi	EN 2850
±45° In-Plane Shear Strength	τ ₁₂	-	-	-	-	85 MPa	12 ksi	69 MPa	10 ksi	EN 14129
±45° In-Plane Shear Modulus	G ₁₂	-	-	-	-	3.9 GPa	0.57 msi	2.7 GPa	0.39 msi	EN14129
0° Interlaminar Shear Strength	X _{ILSS}	80 MPa	11.6 ksi	65 MPa	9.43 ksi	64 MPa	9.28 ksi	42 MPa	6.09 ksi	DMS 2144

BURN BEHAVIOUR

PROPERTY	EP 127-CR508_190-35	EP 127-C20-45P	TEST STANDARD
Flammability vertical, 60s flaming – Burn length	-	110 mm	AITM 2.0002A
Flammability vertical, 60s flaming – After flame time	-	2 s	AITM 2.0002A
Flammability vertical, 60s flaming – After flame time of drips	-	0 s	AITM 2.0002A

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.

E contact@gurit.com

W www.gurit.com