

SE180

HIGH TG EPOXY PREPREG SYSTEM

SE180 Prepreg has been specifically developed for high volume press molding applications and enables users to perform cycle times of 5 minutes.

The product's characteristics facilitate simple preforming prior to moulding and the ability to fill edged detail during molding, allowing net shaped parts to be manufactured.



- Prepreg optimized for compression molding applications
- Developed for automotive component production
- 5 minute cure at 150°C (302°F)
- Good surface finish
- Hot in-Hot out process
- Net shape components achievable via resin flow during press cycle

PRODUCT INFORMATION

AVAILABILITY

SE 180 is available in a range of product formats, including AFP tape formats. Please consult your local sales contact for further information. Full contact details can be found at www.gurit.com.

PROPERTY	UNITS	HEC195	RC380T	TEST METHOD
Tack	Rating	Low	Low	-
Nominal resin content	%	39	42	ISO1172
Nominal fiber weight	g/m ²	195	380	ISO1172
Nominal areal weight	g/m ²	320+/-15	656+/-39	ISO1172
Backer	g/m ²	Paper/embossed poly	Paper/embossed poly	-

PREPREG PROPERTIES

SE 180 can be cured at varying temperatures above 130°C. Cure times are shown in the table below. Press closure cycle needs to be determined by users as optimum press cycle will depend on part and mold shape. Press closure needs to occur before gelation of the resin, indicative gelation times are given below.

HOT IN - HOT OUT CURE TEMPERATURE /TIME	TIME TO 1000 Pa.s RESIN GEL TIME
130°C for 20 minutes	190 seconds
140°C for 10 minutes	110 seconds
150°C for 5 minutes	70 seconds

TRANSPORT AND STORAGE

Store sealed & out of direct sunlight. Frozen transport should be used when transferring between sites.

The storage time at 21°C is determined as the point that changes in handling characteristics of the prepreg are evident (tack and drape). As the prepreg resin reacts at room temperature (21°C) changes in resin flow and minimum viscosity can be observed this could affect the processing characteristics of the prepreg.

STORAGE TEMPERATURE	UNITS	VALUE
-18°C (0°F)	Months	18
+18-20°C (64-68°F)	Weeks	4

All prepreg materials should be stored in a freezer when not in use to maximize 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. After removal from cold storage prepreg should be allowed to warm to room temperature before plastic bag is removed to prevent condensation.

MINIMUM CURE TIME AND TEMPERATURE

PROPERTY	PRESS MOLDING		TEST METHOD
Typical laminate	6 x HEC195 layers		
Typical ramp rate	N/A Load press hot at cure temperature		
Cure temperature	130°C (266°F)	150°C (302°F)	
Cure time	20 min	5min	
Cure pressure	>8 Bar (116Psi)		
Cure vacuum	-		
De-mold temperature	130°C (266°F)	150°C (302°F)	
Dry Tg (DMA)		175°C (347°F)	ASTM D7028
Wet Tg (DMA)		144°C (291°F)	ASTM D7028

MECHANICAL PROPERTIES

PROPERTY	SYMBOL	UNITS	HEC195	RC380T	TEST METHOD
Fabric /fiber description	-	-	HEC= High Elongation Carbon Strength >4.8GPa Modulus 242± 15 GPa	2x2 Woven Carbon Twill 380± 15g/m ² T700 Fiber Strength >4.5GPa Fiber Modulus 230± 9GPa	-
Resin content	-	%	39 ± 3	42 ± 3	
Cure method	-	-	Press Molded at 15 bar (217Psi)	Press Molded at 15 bar (217Psi)	-
Cure schedule	-	-	5 minutes at 150°C (266°F)	5 minutes at 150°C (266°F)	
Cured ply density	ρ_{ply}	g/cm ³ (lb/in ³)	1.54 (0.055)		Archimedes
Glass transition temperature	T _{g1}	°C (°F)	175-178°C (347-352°F)		ISO 6721 (DMA)
Fire resistance	-	-	Passes FMV std No. 302 at laminate thickness of 2.4mm	N/A	FMVSS No.302
Cured ply thickness	t _{ply}	mm (in)	0.21 (0.0083)	0.40 (0.0157)	ASTM D 3171 -II
Fiber volume fraction	V _f	%	50-55	53-55	ASTM D 3171 -II
0° Tensile strength*	X _T	MPa (ksi)	2186 (317)	1158 (168)	ISO 527
0° Tensile modulus*	ET ₁₁	GPa (msi)	136 (20)	70 (10)	ISO 527
0° Compressive strength*	X _C	MPa (ksi)	1322 (191)	750 (109)	SACMA SRM1-94
0° Compressive modulus*	EC ₁₁	GPa (msi)	123 (18)	64 (9.3)	SACMA SRM1-94
90° Tensile strength**	Y _T	MPa (ksi)	49 (7.1)	1076 (156)	ISO 527
90° Tensile modulus**	ET ₂₂	GPa (msi)	7.9 (1.14)	64 (9.3)	ISO 527
90° Compressive strength**	Y _C	MPa (ksi)	218 (32)	727 (106)	SACMA SRM1-94
90° Compressive modulus**	EC ₂₂	GPa (msi)	8.2 (1.18)	65 (9.4)	SACMA SRM1-94
0° Flexural strength	X _F	MPa (ksi)	1723 (249)	782 (115)	ISO 14125
0° Flexural modulus	EF ₁₁	GPa (msi)	108 (16)	56 (8.1)	ISO 14125
±45° In-plane shear strength	τ_{12}	MPa (ksi)	68 (9.9)	78 (11)	ISO 14129
±45° In-plane shear modulus	G ₁₂	GPa (msi)	3.3 (0.48)	4.0 (0.58)	ISO 14129
±45° In-plane shear Poissons ratio	ν_{12}	-	0.8	0.74	ISO 14129
ILSS	X _{ILSS}	MPa (ksi)	96 (13.9)	45 (6.5)	ISO 14130

* normalized to 60% fiber volume fraction

** normalized to 60% fiber volume fraction for RC380T only

HEALTH AND SAFETY

The following points must be considered:

1. Skin contact must be avoided by wearing protective gloves. Gurit recommends the use of disposable nitrile gloves for most applications. The use of barrier creams is not recommended, but to preserve skin condition a moisturizing cream should be used after washing.
2. Protective clothing should be worn when mixing, laminating or sanding. Contaminated work clothes should be thoroughly cleaned before re-use.
3. Eye protection should be worn if there is a risk of resin, hardener, solvent or dust entering the eyes. If this occurs flush the eye with water for 15 minutes, holding the eyelid open, and seek medical attention.
4. Ensure adequate ventilation in work areas. Respiratory protection should be worn if there is insufficient ventilation. Solvent vapors should not be inhaled as they can cause dizziness, headaches, loss of consciousness and can have long term health effects.
5. If the skin becomes contaminated, then the area must be immediately cleansed. The use of resin-removing cleansers is recommended. To finish, wash with soap and warm water. The use of solvents on the skin to remove resins etc must be avoided.

Washing should be part of routine practice:

- before eating or drinking
- before smoking & vaping
- before using the lavatory
- after finishing work

6. The inhalation of sanding dust should be avoided and if it settles on the skin then it should be washed off. After more extensive sanding operations a shower/bath and hair wash is advised.

Gurit produces a separate full Safety Data Sheet for all hazardous products. Please ensure that you have the correct SDS to hand for the materials you are using before commencing work.

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Gurit is continuously reviewing and updating literature. Please ensure that you have the current version by contacting your sales contact and quoting the revision number in the bottom left-hand corner of this page.

CONTACT INFORMATION

Please see local contact information at www.gurit.com

24-HOUR CHEMICAL EMERGENCY NUMBER

For advice on chemical emergencies, spillages, fires or exposures:

Europe	+44 1273 289451
Americas	+1 646 844 7309
APAC	+65 3158 1412

customer.support@gurit.com

www.gurit.com

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