

SE 180

High Tg Epoxy Prepreg System



SE 180 Prepreg has been specifically developed for high volume press moulding 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 moulding, allowing net shaped parts to be manufactured.

- Prepreg optimised for compression moulding 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	Unit	HEC195	RC380T	TEST METHOD
Tack	Rating	Low	Low	-
Nominal Resin Content	%	39	42	ISO1172
Nominal Fibre 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

PROCESSING INFORMATION

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 mould 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 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 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 MOULDING		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	5 min	
Cure Pressure	>8 Bar (116Psi)		
Cure Vacuum	-		
De-mould Temperature	130°C (266°F)	150°C (302°F)	
Dry T _g (DMA)		175°C (347°F)	ASTM D7028
Wet T _g (DMA)		144°C (291°F)	ASTM D7028

MECHANICAL PROPERTIES

PROPERTY	SYMBOL	UNITS	HEC195	RC380T	TEST METHOD
Fabric/Fibre Description	-	-	HEC= High Elongation Carbon Strength >4.8GPa Modulus 242± 15 GPa	2x2 Woven Carbon Twill 380± 15g/m ² T700 Fibre Strength >4.5GPa Fibre Modulus 230± 9GPa	-
Resin Content	-	%	39 ± 3	42 ± 3	
Cure Method	-	-	Press Moulded at 15 bar (217Psi)	Press Moulded 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
Fibre 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

* normalised to 60% fibre volume fraction

** normalised to 60% fibre 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 moisturising cream should be used after washing.
2. 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

3. 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.

NOTICE

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The Company strongly recommends that Customers make test panels in the final process conditions and conduct appropriate testing of any goods or materials supplied by the Company prior to final use 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. Due to the varied nature of end-use applications, the Company does, in particular, not warrant that the test panels in the final process conditions and/or the final component pass any fire standards.

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 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:

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