

SE 200HP

HIGH PERFORMANCE PREPREG SYSTEM

SE 200HP is a high performance, toughened hot-melt, epoxy prepreg suitable for demanding high temperature applications.

SE 200HP is commonly used in vacuum bagging, press-molding, autoclave processes. It maintains excellent hot wet performance and maintenance of thermal properties and stiffness at high operating temperatures up to 220°C (428°F).

Curable on tooling from 135°C (275°F), allowing a free-standing post cure if required. SE200HP is flow controlled with next generation advanced toughening chemistry to maintain performance at high operating temperatures. With an outlife of over 8 weeks at 21°C (69°F), it is optimized for ease of lay-up.



- High temperature prepreg system with 220°C (428°F) T_g
- Excellent hot wet properties
- Next generation toughening maintains high performance even at high operating temperatures
- Curable from 135°C (275°F)
- Out of autoclave compatible
- 8 week outlife at 21°C (69°F)

PRODUCT INFORMATION

AVAILABILITY

SE200HP is available in unidirectional carbon formats ranging in weight from 120 to 600g/m², also woven or multiaxial reinforcements in carbon or glass from 100-1200g/m². Gurit uses a number of qualified fabric and fiber suppliers to enable flexibility within the supply chain and maintain product availability for our customers, which may be adjusted at Gurit's discretion. Our approved fibers are shown in the Table below.

FIBER TYPE	DESCRIPTION	APPROVED FIBER TYPES	STRENGTH (MPa)	MODULUS (GPa)
HEC	High Elongation Carbon	T700, 34-700, H2250, TR50S, TC35, TC36, STS40, HTS40, HTS45	> 4000	227 to 257
IMC	Intermediate Modulus Carbon	T800, IM2C, IM7	> 4400	275 to 310
HMC	High Modulus Carbon	HR40, M40J	> 4300	365 to 405
UHMC	Ultra-High Modulus Carbon	M46J	> 4000	420 to 455

The table above provides indicative values and does not constitute a specification

T700, 34-700, H2250, TR50S, TC35, TC36, STS40, HTS40, HTS45

PREPREG PROPERTIES

The data given does not serve as a formal specification and customers with specific requirements must carry out tests to prove conformity.

RHEOLOGY DATA

PROPERTY	UNITS	VALUE
Minimum viscosity 1°C/min ramp	Pa.s	2.8
Temperature at minimum viscosity	°C	115

TRANSPORT AND STORAGE

STORAGE TEMPERATURE	UNITS	VALUE
-18°C (0°F)	Months	24
+18 to 21°C (64-68°F)	Weeks	8

To maximize the de-frosted shelf life of the material it is beneficial to maintain a cool working environment.

TYPICAL CURE TIME AND TEMPERATURES

All temperatures measured by thermocouple installed on the laminate surface. Vacuum should be maintained as high as possible throughout the cure cycle. 135°C (275°F) should be treated as the minimum cure temperature; lower temperature cures may not generate adequate mechanical properties.

PROPERTY	135°C (275°F) CURE	135°C (275°F) + 200°C (392°F) CURE	TEST METHOD
Processing method	Vacuum bag/Autoclave	Vacuum bag/Autoclave	
Typical ramp rate	0.3 – 2°C/minute	0.3 – 2°C/minute	
Cure time	90 minutes	90 minutes + 2 hours	
Cure pressure	-1 Bar / +6 Bar	-1 Bar / +6 Bar	
Tg (DMA)	151°C (303°F)	223°C (433°F)	ASTM D7028

MECHANICAL PROPERTIES

CURED RESIN PROPERTIES

Resin cast oven cured, mean values.

PROPERTY	SYMBOL	UNITS	90 MIN at 135°C + 2 HOURS 200°C		TEST METHOD
Flexural strength	σ_F	MPa (ksi)	111	(16)	ISO 178
Flexural modulus	E_F	GPa (ksi)	3.0	(435)	ISO 178
Compressive yield strength	σ_C	MPa (ksi)	255	(37)	ISO 604

CARBON WOVEN LAMINATE PROPERTIES

Mean values derived from data from a single batch, cured 2 hours at 200°C (392°F). Where test directions are given, they are with respect to the warp direction of the roll. Fabrics contained in these preregs are 2X2 twill woven with High Elongation Carbon (HEC).

PROPERTY		UNITS	RC200T Autoclave		RC200T Vacuum bag		TEST METHOD
Uncured resin content		%	40		40		ASTM D3171- II
Cured ply thickness		mm	0.2		0.2		ASTM D792
Fiber volume fraction	V_f	%	50		50		ASTM D3171 - II
0° Tensile strength*	X_T	MPa (ksi)	958	(138)	810	(117)	ISO527-5
0° Tensile modulus*	E_T	GPa (Msi)	67	(9.7)	65	(9.4)	ISO527-5
0° Compressive strength*	X_C	MPa (ksi)	990	(143)	792	(114)	SACMA SRM1-94
0° Compressive modulus*	E_{C11}	GPa (Msi)	68	(9.8)	67	(9.7)	SACMA SRM1-94
90° Tensile strength	Y_T	MPa (ksi)	854	(123)	845	(122)	ISO527-5
90° Tensile modulus	E_{T22}	GPa (Msi)	67	(9.7)	65	(9.4)	ISO527-5
0° Flexural strength	X_F	MPa (ksi)	1041	(150)	955	(138)	ISO14125
0° Flexural modulus	E_{F11}	GPa (Msi)	60	(8.7)	59	(8.5)	ISO14125
0° ILSS	X_{ILSS}	MPa (ksi)	51	(7.4)	47	(6.8)	ISO14130
0° ILSS tested at 150°C	X_{ILSS}	MPa (ksi)	-	-	38 (81% retention)	-	ISO14130
In plane shear strength		MPa (ksi)	68	(9.86)	64	(9.2)	ISO14129
In plane shear modulus		GPa (Msi)	3.8	(0.5)	4.5	(0.65)	ISO14129

* Normalised to 60% V_f

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.

NOTICE

All advice, instruction or recommendation is given in good faith but the selling Gurit entity (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 Gurit's Website: www.gurit.com/terms-and-conditions.aspx

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

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