MAKOBOND P-2000 SERIES PREPREGS

PRODUCT DESCRIPTION

The Makobond P-2000 series are high-performance, flame-retardant, epoxy prepreg systems coated on various fabrics (carbon, aramid, or fiberglass), designed for high strength, high-clarity, laminated composite components. Flexible cure profile and extended out-time of 30+ days make the P-2000 Series Prepregs ideal for industrial manufacturing, marine structures, automotive parts, aerospace components, and high-end sporting goods. Cured P-2000 prepreg components can withstand a maximum dry operating temperature of 121°C (250°F). A flexible cure cycle enables preparation of parts with superior surface finishes, reducing secondary finish work and making it a versatile and reliable choice for a variety of applications.

PRODUCT FORMS

P-2000-C: CARBON **P-2000-A**: ARAMID **P-2000-F:** FIBERGLASS

PRODUCT HIGHLIGHTS

•Versatile cure profile •Flame retardant •Cosmetically Clear •Long work life

PRODUCT CHARACTERISTICS

Property	P-2000-X
Color	Clear Resin (color of component is reinforcement-dependent)
P-2000-C Standard Reinforcements	282 (3k PW, 200 gsm) 284 (3k twill, 200 gsm) 670 (12k twill, 670 gsm)
P-2000-A Standard Reinforcements	5120 (58 gsm) 5285 (4HS, 170 gsm)
P-2000-F Standard Reinforcements	120 (4HS, 106 gsm) 7781 (8HS, 295 gsm)

MATRIX PROPERTIES

Property	Results	Method
Matrix Density (g/cc)	1.22 g/cc	MST-09
Gel Time @ 180°F (82°C)	~180 min	Gel Time @ 180°F (82°C)
Gel Time @ 250°F (121°C)	~15 min	Gel Time @ 250°F (121°C)
Tg (cured 185F / 8 hrs)	202°F	DMA
Tg (Post Cure 120C / 4 hrs)	281°F	DMA
Working Life	60 days	RT

MAKO ADVANCED MATERIALS

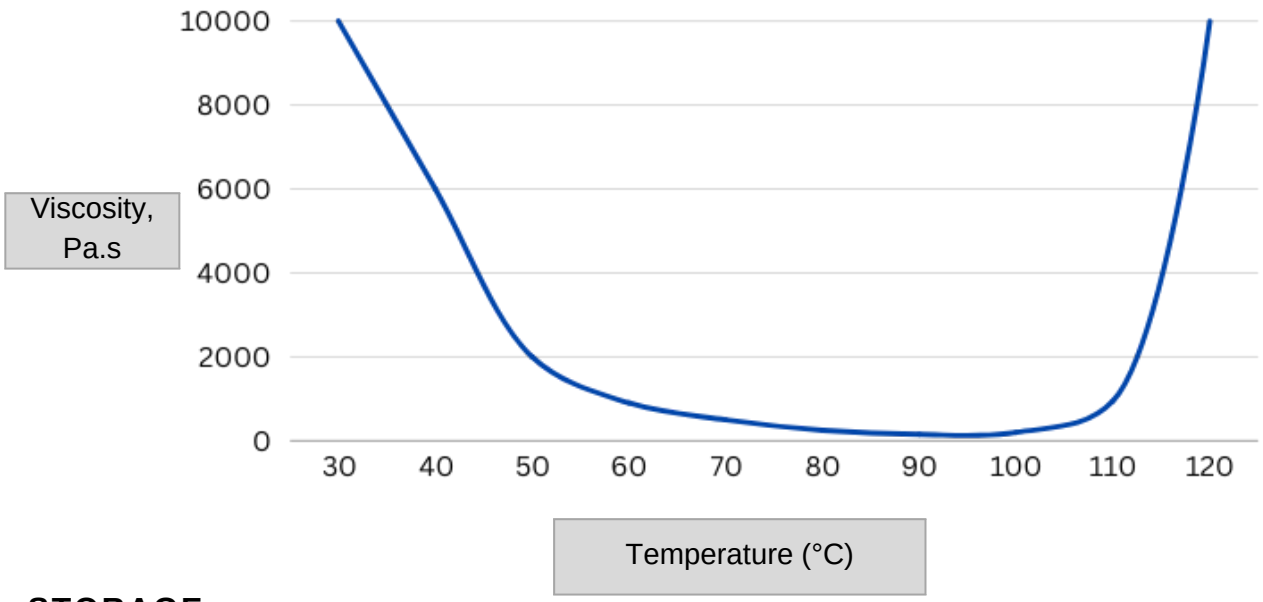
MAKOBOND P-2000 SERIES PREPREGS

HANDLING AND CURING

Managing excessive air and moisture exposure during the handling and curing process is important, as it may lead to cure inhibition, resulting in an unfinished and tacky surface. Allow product 4-6 hours to reach ambient temperatures after removal from storage. Users can expect to trial a variety of cure processes and tactics to perfect individual part results. The overall goal is to optimize the curing conditions, achieve uniformity, reduce porosity, and enhance the quality of the elastomeric end product. While a variety of processes (bladder, press, autoclave, vacuum bag, tube wrap) can be used, an illustrative vacuum bag process is presented below.

Step	Cure Cycle	Vacuum Pressure	Time	Temp	Note
1	Debulk	>27.5 mm Hg	3 hours	RT	For best surface, debulk just the initial ply for 30 mins at 150F
2	Initial Cure	>27.5 mm Hg	8 hours	185°F	Ramp at 2-4°F / min
3	Post Cure (if desired)	N/A	4 hours	250°F	Ramp at 2-4°F / min

MAKOBOND P-2000 TEMPERATURE VS. VISCOSITY



STORAGE

P-2000 shelf life is 12 months if stored at 40°F or below in sealed packaging. Store rolls suspended on retainers to avoid pressure points and film loosening or crushing. Use care to prevent condensation upon thawing by maintaining rolls in sealed bags until they reach RT. Replace ripped or torn bags, reseal after opening.

MAKOBOND P-2000 SERIES PREPREGS

MECHANICAL PROPERTIES

P-2000-C-284-50" RC42

Carbon: 3k 2x2 Twill T300 (284)

Style 284 Carbon	Test Temp	ASTM Method	Result
Tensile Strength	RT	D3039	109 ksi
Tensile Modulus	RT	D3039	8.9 msi
Compressive Strength	RT	D3410	81 ksi
Compressive Modulus	RT	D3410	7.9 msi
Short Beam Shear Strength	RT	D2344	10.6 ksi
Inplane Shear Strength	RT	D3410	14.0 ksi
Inplane Shear Strength	RT	D3518	14 ksi

P-2000-F-7781-50" RC38

Fiberglass: 7781 8HS Weave

Style 7781 Fiberglass	Test Temp	ASTM Method	Result
Tensile Strength	RT	D3039	77 ksi
Tensile Modulus	RT	D3039	3.9 msi
Compressive Strength	RT	D3410	72 ksi
Compressive Modulus	RT	D3410	3.7 msi
Short Beam Shear Strength	RT	D2344	9.6 ksi
Flexural Strength	RT	D790	99 ksi
Flexural Modulus	RT	D790	4.1 ksi

HEALTH & SAFETY

Users need to exercise proper care while working with material; gloves, eyewear, and proper ventilation are recommended. Please refer to the SDS for this specific product for specific details. Improper use of this product, especially with high heat and thicknesses, can cause exothermic reactions. Consult Mako specialists with specific inquiries.

DISCLAIMER

All data and advice are provided in good faith. Mako gives no guarantee or warranty, express or implied, relative to information shared. All users should perform testing specific to their application to determine suitability for a particular purpose.