



Advanced Materials

RenShape® 5065

HIGH PERFORMANCE, HIGH TEMPERATURE EPOXY BOARD

DESCRIPTION :

The RenShape® 5065 epoxy board is designed for use at temperatures up to 400°F (204°C). The board is well suited for building aerospace master models, lay-up tools for high-temperature curing prepregs, and other heat-resistant tooling. The RenShape® 5065 epoxy board features a low coefficient of thermal expansion to produce models and tools with good accuracy and dimensional stability. It has a very high glass transition temperature of 470°F (243°C).

ADVANTAGES

- Easy to CNC machine
- Good edge definition
- Good dimensional stability
- Good surface finish
- Prepreg compatible
- High Tg

ACCESSORIES

Epoxy Adhesive

RenLam® 4017 Resin / Ren® 1510 Hardener

TYPICAL PROPERTIES*

Property	Test Method	Units	Test Values		
Appearance Color	Visual	Visual	Gray		
Density	ASTM D-792	lb./ft. ³ (g/cm ³)	49 (0.79)		
Hardness	ASTM D-2240	Shore D	70		
Ultimate Flexural Strength	ASTM D-790	psi (MPa)	4,900 (33.8)		

**TYPICAL
PROPERTIES***

Continued

Property	Test Method	Units	Test Values		
Flexural Modulus	ASTM D-790	psi (MPa)	425,000 (2931)		
Ultimate Tensile Strength	ASTM D-638	psi (MPa)	3076 (21.2)		
Ultimate Tensile Modulus	ASTM D-638	psi. (Mpa)	397,600 (2742)		
Tg by DMA, E'	ASTM D-4065	°F (°C)	470 (243)		
Tg by TMA		°F (°C)	470 (242.7)		
Compressive Strength	ASTM D-695	psi (MPa)	8,264 (57)		
Compressive Modulus	ASTM D-695	psi (MPa)	203,863 (1406)		
Izod Impact	ASTM D-265	ftlbs/in of notch	0.158		
Coefficient of Thermal Expansion	ASTM D-3386	-22° to 86°F, (in/in/°F)	18 x 10 ⁻⁶		
		-30° to 30°C, (in/in/°C)	32 x 10 ⁻⁶		
		77° to 302°F (in/in/°F)	19.3 x 10 ⁻⁶		
		25° to 150°C (in/in/°C)	34.7 x 10 ⁻⁶		
		77° to 392°F (in/in/°F)	20.3 x 10 ⁻⁶		
		25° to 200°C (in/in/°C)	36.5 x 10 ⁻⁶		

Tested @ 77°F unless noted

NOTE : These physical properties are reported as typical test values obtained by our test laboratory. If assistance is needed in establishing product specifications, please consult with our Product Management Department.

Use RenLam® 4017 with Ren® 1510 adhesive system for bonding. Let it cure 24 hrs. @ room temperature before ramping up tool temperature for 2 hrs. minimum (up to 6 hrs.) @ 150°F. This cure time range is given because of tool size variations which will effect the time at temperature needed at center of mass of bonded tool. Tool can then be machined to shape after this initial cure. Tool should then be run through the cure needed for part before actual part is run through cure on tool. See below cure information.

IMPORTANT!

Post-Cure of parts on Renshape® 5065 Tools: The temperature differential (delta T) between the center of the tool and the external surface must never exceed 50°F on either ramp up or cool down. To achieve this, a temperature soak of 6 hours every 50°F up and down in the oven and temperature ramp rates of no more than 1°F/min are recommended, but if the temperature differential would exceed 50°F then these parameters need to be adjusted until it fits. Leave the tool in the oven for at least 6 hours below 100°F before opening doors and exposing the tool to room temperature conditions. Use of RenShape® High Performance Sealer is recommended. When used along with a release system, it greatly helps surface sealing and release.

MACHINING	Roughing Speed	Roughing Feed	Finishing Speed	Finishing Feed
	1,600 RPM	40 IPM (101cm/min.)	10,000 RPM	100 IPM (254cm/min.)

Cutters: Roughing: 1 in. (2.5cm) Hog Ball End Mill 4-Flute HS Steel 8% cobalt

Finishing : 5/8 in (16mm) Ball End Mill 2-Flute Carbide

Depth: Roughing varies from 0.25 in. to 2.5 in. (6mm to 6.35cm) with 40% stepover Finishing depth is 1/8 in. (3mm) leaving a 0.002 in. (0.05mm) scallop height

These machining parameters are represented as starting points. Cutter type and material, spindle speed, feed rate, machine power and rigidity all affect machining results. User must determine the best parameters for specific situations.

STORAGE

RenShape® 5065 boards should be stored flat in a dry place, in the sealed original container, at temperatures between +2°C and +40°C (+35.6°F and 104°F). Under these storage conditions, the shelf life is 10 years. The product should not be exposed to direct sunlight.

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First Aid!

Refer to MSDS as mentioned above.

KEEP OUT OF REACH OF CHILDREN

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