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Advanced Materials

RenLam® 4005 / Ren® 1500 Laminating System

HEAT-RESISTANT EPOXY LAMINATING SYSTEM

- High Temperature Performance
- Unfilled
- Good Work Life

DESCRIPTION :

RenLam® 4005 (Resin) / Ren® 1500 (Hardener) epoxy laminating system is an unfilled, two-component material designed to perform at temperatures up to 300ºF (149°C). Intermittent use is possible in the 300°F (149°C) to 350°F (177°C) range. Laminated tools built with RenLam® 4005 / Ren® 1500 epoxy laminating system can be constructed with regular hand lay-up techniques or vacuum bagged, if the tool is small enough to allow the operator to complete bagging and squeezing operations before the material starts to gel. The system gels at room temperature but must be postcured to achieve maximum strength. RenLam® 4005 / Ren® 1500 system is well suited for use in building vacuum-form, RTM, RIM and compression molds as well as other high-temperature tooling. This system can be utilized with large quantities of bulk fill, such as RP 39 aluminum grain for casting.

TYPICAL MIXED PROPERTIES:

Property		**ASTM Test Method**	**Test Values**[1]
Gel Time (4 fl. oz.)		ASTM-D-2471	50 – 60 min.
Color	RenLam® 4005	Visual	Amber
	Ren® 1500		Amber
	Mixed		Amber
Viscosity, mixed, cP at 77°F (25°C)		ASTM-D-2393	1,900

[1] Tested @ 77 °F (25 °C)

MIX RATIO :

RenLam® 4005 : Ren® 1500	100:14 by weight
	100:15 by volume

Stir each component thoroughly before use. Weight each component accurately (±5%) into clean containers. Thoroughly mix resin and hardener together (minimum of three minutes), scraping container sidewalls, bottom and mixing stick several times to assure a uniform mix.

TYPICAL CURED PROPERTIES:

	Cure Value	Test-Method
Specific Gravity (cast)	1.19	ASTM D-792
Cubic Inch per Pound	23.3	ASTM D-792
Hardness, Shore D	90	ASTM-D-2240
Ultimate Flexural Strength, at 77ºF (25°C), psi (MPa)	35,000 (241)	ASTM-D-790
Flexural Modulus, at 77°F (25°C), psi (MPa)	$1.6x10^6$ (11,034)	
Ultimate Tensile Strength, at 77°F (25°C), psi (MPa)	26,000 (179)	ASTM D-638
Tg by DMA, E'', °F (°C)	338 (166)	ASTM D-4065
Ultimate Compressive Strength, at 77°F (25°C), psi (MPa)	28,000 (193)	ASTM D-695
Deflection Temperature (264 psi), °F (°C)	289 (143)	ASTM D-648
Coefficient of Thermal Expansion, in./in./°F	8.5×10^{-6}	ASTM D-3386

Cure Schedule – Contact laminate, 10 oz. glass cloth, 90° rotation, postcured 24 hrs. at 77°F (25°C), + 2 hrs. at 150°F (66°C) + 2 hrs. 200°F (93°C) + 2 hrs. at 250°F (121°C) + 2 hrs. at 300°F (149°C), tested at 77°F (25°C).

NOTE : Typical Properties – 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 Quality Control Department.

CURING INSTRUCTIONS :

With proper backup completed, allow to gel at room temperature followed by a postcure of two hours at 150°F (66°C) plus two hours at 200°F (93°C), plus two hours at 250°F (121°C), plus two hours at 300°F (149°C).

HANDLING:

Material temperatures should be about 65°F (18°C) when mixing. After use, tightly reseal containers.

STORAGE :

RenLam® 4005 and Ren® 1500 should be stored 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 2 years. The product should not be exposed to direct sunlight.

PRECAUTIONARY STATEMENT :

Huntsman Advanced Materials Americas LLC maintains up–to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.

First Aid!
Refer to MSDS as mentioned above.

KEEP OUT OF REACH OF CHILDREN

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