

## Laminating Resins

# L Series

## LHP

# High Performance Laminating Resins

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### Description

CCP's LHP high performance laminating resin series is designed for open mold processes where hand lay up and spray up applications are used with neat resin. LHP is a low profile system that demonstrates superior resistance to heat as well as excellent flexural and tensile properties. Along with these qualities, LHP resins are characterized by process friendly handling characteristics, superior cosmetics, and excellent durability.

### Features and Benefits

- Excellent cosmetic stability
- Superior handling characteristics for short cycle times and user-friendly applications.
- High elongation for tough durable laminates.

### Recommended Usage

LHP high performance laminating resins have been developed in order to provide superior toughness in the field combined with world-class cosmetics. They are ideal for production environments where compromises are not an option.

### Application Characteristics

- A) Regular viscosity & regular cure
- B) Regular viscosity & thin cure
- C) Regular viscosity & thick cure
- D) Low viscosity & regular cure
- E) Low viscosity & thin cure
- F) Low viscosity & thick cure
- G) High viscosity & regular cure
- H) High viscosity & thin cure
- I) High viscosity & thick cure

### Viscosity and Cure Properties

These values are manufacturing control criteria. They are listed for a reference guide only. Particular batches



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will not conform exactly to the numbers listed because storage conditions, temperature changes, age, testing equipment (type and procedure) can each have a significant effect on testing. Products with properties outside of these readings can perform acceptably. Final suitability of this product is in the end use performance.

**Values for Viscosity Classifications**

Type	Viscosity	% Styrene	Thixotropic Index
Regular	500 cps	< 35	2.8
Low	400 cps	38	3.2
High	600 cps	< 35	3.5

**Lamination Properties - Viscosity**

Regular Viscosity 500 cps	Low Viscosity 400 cps	High Viscosity 600 cps
<ul style="list-style-type: none"> <li>Meets Rule 1162</li> <li>Standard lamination with good wet out</li> </ul>	<ul style="list-style-type: none"> <li>Superior wet out</li> <li>Maximum fiber wetting with high glass content</li> </ul>	<ul style="list-style-type: none"> <li>Meets Rule 1162</li> <li>For lamination of large vertical surfaces</li> <li>High ambient temperature application</li> </ul>

**Gel Times for Cure Types**

	12	17	22	27	32	37	42	45
Regular Cure:								
Gel to Peak	9	9	9.5	9.5	10	11	12	12
Peak Exotherm	320	320	315	315	306	300	295	295
Thin Cure:								
Gel to Peak	8.5	8.5	10.2	10.2	10.5	10.5	14	14
Peak Exotherm	345	345	338	338	327	323	320	320
Thick Cure								
Gel to Peak	10	10	10.6	10.6	11.8	12.4	14	14
Peak Exotherm	315	215	311	309	303	299	290	290



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**Lamination Properties - Viscosity**

Regular Cure 125 – 180 mils	Thin Cure < 125 mils	Thick Cure >180 mils
<ul style="list-style-type: none"> <li>Moderate Cure Time</li> <li>Single Stage or Multi-Pass Lamination</li> <li>Moderate Exotherm</li> </ul>	<ul style="list-style-type: none"> <li>Quickest Cure</li> <li>Designed for Multi-Pass Applications</li> <li>Quick Barcol Development</li> <li>Made for High Glass Content Applications</li> </ul>	<ul style="list-style-type: none"> <li>Slower Cure than Regular</li> <li>Single Stage Lamination</li> <li>Reduced Exotherm</li> </ul>

**Gel Times\***

12 minutes	27 minutes	42 minutes
17 minutes	32 minutes	42 minutes
22 minutes	37 minutes	45 minutes

\*100g resin mass with 1.25% by weight MEKP catalyst

**Cure**

It is recommended that gel time be checked in the customer’s plant, as age, temperature, humidity and catalyst will produce varied gel times.

The catalyst level should not exceed 2.4% or fall below 0.9% for proper cure. Recommended range is 0.9% to 2.4% with 1.2% at 77°F being ideal.

This product should not be used when temperature conditions are below 60°F, as curing may be adversely affected.

**Physical Properties**

Polyesters do not develop ultimate physicals, i.e., “cure,” right away. Time and/or heat are needed. Heat may come from internal exotherm or external sources. The amount of catalyst will influence the cure. With time and/or heat, a “moderate cure” will develop into “ultimate physicals.”

When the part reaches ultimate cure depends upon time, temperature and satisfactory catalyzation. Too much or too little catalyst can result in permanent under-cure, which cannot be overcome. Practically speaking, serviceable cure time will range from overnight to a week and occasionally longer due to circumstances. Small, properly catalyzed, thin laminates that do not exotherm and do not receive external heat may take months or years to achieve ultimate physicals. Sufficient external heat can reduce the cure time to less than a day.



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Test	Clear Cast	2 ply Laminate 1.5 oz. Chopped Strand Mat
Tensile Strength	7800 psi	14,000 psi
Tensile Modulus	0.53 x 10 <sup>6</sup> psi	1.16 x 10 <sup>6</sup> psi
Tensile Elongation	2.329%	1.675%
Flexural Strength	13,000 psi	22,000 psi
Flexural Modulus	0.53 x 10 <sup>6</sup> psi	0.93 x 10 <sup>6</sup> psi
Heat Distortion	91°C (195.8°F)	N/A

### Caution

Do not over-mix. Over-mixing can break down a resin system, increasing its tendency to sag. Material should be mixed once a day for 10 minutes. The resin should be mixing to the sides of the container with the least amount of turbulence possible. Air bubbling should not be used for mixing; it is not effective and only serves as a potential for water or oil contamination.

Do not add any material, other than the recommended fillers and methyl ethyl ketone peroxide, to this product without the advice of a representative of CCP Composites US.

### Adhesion

It is recommended that all laminates that have been heat-cured, exposed to direct sunlight, or allowed to cure for more than 72 hours at room temperature be sanded before the next laminate is applied.

### Storage Limitations

Uncatalyzed, standard cure polyester products have a usage life of three months from date of shipment when stored at 73°F or below in a closed, factory-sealed, opaque container, and out of direct sunlight.

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Without limiting the generality of the foregoing, if any product fails to meet warranties mentioned above, Seller shall at Seller's option either replace the nonconforming product at no cost to Buyer or refund the Buyer the purchase price thereof. The foregoing is Buyer's sole and exclusive remedy for failure of Seller to deliver or supply product that meets the foregoing warranties. Seller's liability with respect to this contract and the product purchased under it shall not exceed the purchase price of the portion of such product as to which such liability arises. Seller shall not be liable for any injury, loss or damage, resulting from the handling or use of the product shipped hereunder whether in the manufacturing process or otherwise. In no event shall Seller be liable for special, incidental or consequential damages, including without limitations loss of profits, capital or business opportunity, downtime costs, or claims of customers or employees of Buyer. Failure to give Seller notice of any claim within thirty (30) days of shipment of the product concerned shall constitute a waiver of such claim by Buyer. Any product credit received by Buyer hereunder, if not used, shall automatically expire one (1) year from the date the credit was granted. Notwithstanding any applicable statute of limitations to the contrary, any action by Buyer relation to a claim hereunder must be instituted no later than two (2) years after the occurrence of the event upon which the claim is based. All the foregoing limitations shall apply irrespective of whether Buyer's claim is based upon breach of contract, breach of warranty, negligence, strict liability, or any other legal theory.

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## COMPOSITES SAFETY INFORMATION (October 2011)

All sales of products manufactured by CCP Composites US (CCP), and described herein, are made solely on condition that CCP's customers comply with applicable health and safety laws, regulations and orders relating to the handling of our products in the workplace. Before using, read the following information, and both the product label, and Material Safety Data Sheet pertaining to each product.

Most products contain styrene. Styrene can cause eye, skin and respiratory tract irritation. Avoid contact with eyes, skin and clothing. Impermeable gloves, safety eyewear and protective clothing should be worn during use to avoid skin and eye contact. Wash thoroughly after use.

Styrene is a solvent and may be harmful if inhaled. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Extended exposure to styrene at concentrations above the recommended exposure limits may cause central nervous system depression causing dizziness, headaches or nausea and, if overexposure is continued indefinitely, loss of consciousness, liver and kidney damage.

Do not ingest or breathe vapor, spray mists or dusts caused by applying, sanding, grinding and sawing products. Wear an appropriate NIOSH/MSHA approved and properly fitted respirator during application and use of these products until vapors, mists and dusts are exhausted, unless air monitoring demonstrates vapors, mists and dusts are below applicable exposure limits. Follow respirator manufacturer's directions for respirator use.

The International Agency for Research on Cancer (IARC) reclassified styrene as Group 2B, "possibly carcinogenic to humans." This revised classification was not based on new health data relating to either humans or animals, but on a change in the IARC classification system. The Styrene Information and Research Center does not agree with the reclassification and published the following statement: Recently published studies tracing 50,000 workers exposed to high occupational levels of styrene over a period of 45 years showed no association between styrene and cancer, no increase in cancer among styrene workers (as opposed to the average among all workers), and no increase in mortality related to styrene.

Styrene is classified by OSHA and the Department of Transportation as a flammable liquid. Flammable products should be kept away from heat, sparks, and flame. Lighting and other electrical systems in the work place should be vapor-proof and protected from breakage.

Vapors from styrene may cause flash fire. Styrene vapors are heavier than air and may concentrate in the lower levels of molds and the work area. General clean air dilution or local exhaust ventilation should be provided in volume and pattern to keep vapors well below the lower explosion limit and all air contaminants (vapor, mists and dusts) below the current permissible exposure limits in the mixing, application, curing and repair areas.

Some products may contain additional hazardous ingredients. To determine the hazardous ingredients present, their applicable exposure limits and other safety information, read the Material Safety Data Sheet for each product (identified by product number) before using. If unavailable, these can be obtained, free of charge, from your CCP representative or from: CCP Composites US, P.O. Box 419389, Kansas City, MO 64141-6389; 816-391-6053.

**FIRST AID:** In case of eye contact, flush immediately with plenty of water for at least 15 minutes and get medical attention; for skin, wash thoroughly with soap and water. If affected by inhalation of vapors or spray mist, remove to fresh air. If swallowed, get medical attention.

Those products have at least two components that must be mixed before use. Any mixture of components will have hazards of all components. Before opening the packages read all warning labels. Observe all precautions.

Keep containers closed when not in use. In case of spillage, absorb with inert material and dispose of in accordance with applicable regulations. Emptied containers may retain hazardous residue. Do not cut, puncture or weld on or near these containers. Follow container label warnings until containers are thoroughly cleaned or destroyed.

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