

# STYPOL®

## 040-4221, 040-4232 Orthophthalic Laminating Resin

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### Type

STYPOL® 040-4221 and 040-4232 are pre-promoted low exotherm laminating resins. Their low exotherm characteristics enable thick laminates to be made without excessive exotherm.

### Uses

These resins are designed for use for general spray-up as well as hand lay-up applications.

### Distinguishing Characteristics

STYPOL® 040-4221 and 040-4232 offers the following features:

- Low exotherm
- Fast glass fiber wet-out
- Minimal fiber transfer
- Early development of Barcol hardness

### Typical Liquid Properties (at 77°F)

These values may or may not be manufacturing control criteria. They are listed for a reference guide only. Particular batches 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 the testing. Products with properties outside of these readings can perform acceptably. Final suitability of this product is in the end use performance.

Test	Value
Viscosity (25°C), Brookfield RVT #2 Spindle @ 50 rpm	450 cps
Thixotropic Index	3.0
Weight per Gallon	9.14 lbs
Non Volatile Material	56%



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### Typical Cup & Laminate Data

	040-4221	040-4232
Gel Time with 1.25% MEKP-900	27 minutes	15 minutes
Time to Peak	16 minutes	12 minutes
Peak Exotherm	295°F	295°F
Laminate (Gel Time)	30 minutes <sup>1</sup>	17 minutes <sup>2</sup>
1 <sup>st</sup> Barcol #934	1.5 hours	1.5 hours
20 Barcol	2.25 hours	2.0 hours
24-hr. Barcol	45	45

<sup>1</sup>STYPOL® 040-4221: 4 plies, 1.5 ounce chopped strand mat, 30% glass content, 1.25% MEKP-900.

<sup>2</sup>STYPOL® 040-4232: 2 plies, 2 ounce chopped strand mat, 30% glass content, 1.25% MEKP-900.

### 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 will the part reach ultimate cure? It 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.

Test	Clear Casting	Laminate
Tensile Strength	6,000 psi	12,420 psi
Tensile Modulus	0.65 x 10 <sup>5</sup> psi	1.27 x 10 <sup>5</sup> psi
Tensile Elongation	1.2%	1.3%
Flexural Strength	11,500 psi	23,450 psi
Flexural Modulus	0.60 x 10 <sup>5</sup> psi	1.02 x 10 <sup>5</sup> psi
Heat Distortion Point, 264 psi	67°C	--
Barcol Hardness	--	45
Izod Impact, Un-notched	--	16.0 ft.-lb.

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Glass Content	--	30% <sup>1</sup>
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<sup>1</sup> 2 plies, 2 ounce chopped strand mat

## 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 1.25% at 77°F being ideal.

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

## 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.

## Storage

Uncatalyzed, standard cure polyester products have a usage life of 90 days 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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WARRANTIES, DISCLAIMERS AND LIMITATION OF LIABILITY (Rev. 10/11)**

Seller warrants that: (i) Buyer shall obtain good title to the product sold hereunder, (ii) at Shipment such product shall conform to Seller's specifications; and (iii) the sale or use of such product will not infringe the claims of any U.S. patent covering the product itself, but Seller does not warrant against infringement which might arise by the use of said product in any combination with other products or arising in the operation of any process. **SELLER MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO SELLER. ANY APPLICATION INFORMATION OR ASSISTANCE WHICH SELLER MAY FURNISH TO BUYER IS GRATUITOUS AND SHALL IN NO WAY BE DEEMED PART OF THE SALE OF PRODUCT HEREUNDER OR A WARRANTY OF THE RESULTS OBTAINED THROUGH THE USE OF SUCH PRODUCT.**

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.

**FOR INDUSTRIAL USE AND PROFESSIONAL APPLICATION ONLY. KEEP OUT OF REACH OF CHILDREN.**