STYPOL®

# RSCA1500
# High Performance, Shrink Controlled LRTM Resin

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## Description

STYPOL® RSCA1500 is a pre-promoted resin containing reactive monomers. It is formulated for the fabrication of composite parts using the Light Resin Transfer Molding (LRTM) process at ambient conditions. RSCA1500 is a low profile, shrink controlled resin that provides dimensional stability as well as exceptional surface quality.

## Features and Benefits

- Dimensional control for part stability
- Excellent surface quality
- Excellent heat resistance
- Low viscosity for excellent fiber wet out and fiber loading

## Typical Liquid Properties (77ºF)

Liquid properties of STYPOL® RSCA1500 are shown below. These values may or may not be manufacturing control criteria. They are listed as a reference guide only. Particular batches will not conform exactly to the numbers listed because storage conditions, temperature changes, age, and 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 the product is in the end use performance.

| Test | STYPOL® RSCA1500 |
|---|---|
| Viscosity (1) | 105 cps |
| Gel Time (2) | 15 minutes |
| Weight per Gallon | 8.7 lbs. |

(1) Brookfield LVT, spindle #2 at 60 rpm

(2) 50 g mass, 1.5% United Initiators NOROX® MEKP-9

## Physical Properties

The physical properties of STYPOL® RSCA1500 are shown below. Properties are shown for neat resin casting. These are typical values and are provided for reference only. Note: The physical properties of thermoset resins evolve as the resin cures. The properties given below are for well cured castings. Resin (and laminates) at different stages of cure will have varying properties.

| Test | Test Method (1) | Neat Resin Casting (2) |
|---|---|---|
| Tensile Strength | ASTM D638 | 7,900 psi |
| Tensile Modulus | | 506,000 psi |
| Tensile Elongation | | 2.05% |
| Flexural Strength | ASTM D790 | 12,300 psi |
| Flexural Modulus | | 472,000 psi |
| Glass Transition Temperature, Tg (3) | Dynamic Mechanical Analysis | 345°F (174°C) |

(1) All tests run per internal Polynt test methods. These methods are similar to the ASTM method listed above.
(2) Neat resin casting catalyzed with 1.5% United Initiators NOROX® MEKP-9. The casting cured and post cured at 150°F (66°C). Total cure time was 4 hours.
(3) Test conducted per Polynt Composites internal test method, POLYNT-22-TAS-TM-3008

## Application

Use of proper application procedures is critical to obtaining the full benefits of STYPOL® RSCA1500 resin. Crucial process parameters include temperature, peroxide type and level, reinforcement content and laminate thickness. Prior to any large scale part production, sample laminates should be made varying these parameters until laminate exotherm temperatures over 135°F (570°C) are achieved. Laminates with exotherm temperatures below 135°F (570°C) will have poor cure and shrinkage control. High exotherm temperatures may damage molds. Exotherm temperatures above 200°F (930°C) should be avoided.

**STYPOL® RSCA1500 resin turns from clear amber liquid to a creamy white when it cures. This color change is a leading indicator that the product has been applied and is working properly.** Temperature extremes above 200ºF (93°C) should be avoided.

**Temperature** – The recommended temperature range for use of STYPOL® RSCA1500 resin is 70-95°F (21°C-35°C). Temperatures above and below this range are discouraged. However, STYPOL® RSCA1500 resin can still be processed if laminate thickness and initiator levels are adjusted and tested for the “ambient” condition.

**Catalyst** – STYPOL® RSCA1500 resin is quality control tested using United Initiators NOROX® MEKP-9. Other 9% oxygen MEKP catalysts such as Arkema’s Luperox™ DDM-9, and AKZO Nobel CADOX® D-50 are expected to yield similar performance. The catalyst level for MEKP type catalysts should not exceed 2.4% or fall below 0.9% for proper cure.

While United Initiators NOROX® MEKP-9 is used for QC purposes, alternate catalyst types may be needed to reach the required laminate exotherm. Acetylacetone peroxides (AAP) such as United Initiators Norox® Azox or AAP blends such as United Initiators Anodox SHP-90 should be considered for thin, high glass content laminates or in cool temperatures. Cumene hydoperoxide/MEKP peroxide blends may be considered for thick, lower glass content laminates or in high temperatures. Recommended CHP catalysts are those that have less than 30% CHP such as United Initiators Norox® MCP-21. Refer to catalyst manufacturers guidelines for appropriate levels of other types of catalysts.

**Glass Content** – A target glass content should be determined in the laminate design stage based on the types of glass used in the laminate schedule and the amount of glass needed to achieve strength requirements. However, the glass content obtained in actual laminate fabrication will vary as process parameters vary. Decreases in glass content will increase laminate exotherms. Increasing glass content will lower laminate exotherm.

**Laminate Thickness** – The required laminate thickness should also be determined during laminate design and is largely controlled by the laminate schedule. STYPOL® RSCA1500 can be used to infuse wide range of laminate thicknesses (0.25-2.0 inches) provided the other critical factors (temperature, catalyst type and level and glass content) are adjusted and controlled properly. Thicker laminates will reach higher exotherm temperatures than thinner laminates.

Any parts made with STYPOL® RSCA1500 that require secondary bonding should be evaluated for adhesion. In some cases use of FRP adhesion promoters will be required.

## Caution

Do not add any material, other than peroxide catalyst to this product without the advice of a representative of Polynt Composites.

## Storage

STYPOL® RSCA1500 has a shelf life of 120 days from date of manufacture when stored at 73°F (23°C) or below in a closed, factory sealed, opaque container, and out of direct sunlight. The shelf life is cut in half for every 20°F over 73°F.

## SDS / Data Sheets

SDS and data sheets can be obtained by contacting your Polynt representative or Polynt Customer Service at 800-322-8103.

## POLYNT SAFETY INFORMATION

All sales of products manufactured by Polynt and described herein, are made solely on condition that Polynt 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 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 12th Report on Carcinogens issued by the National Toxicology Program lists styrene as a “reasonably anticipated” carcinogen, but the Report cautions that the NTP listing does not mean that styrene presents a risk to persons in their daily lives. The Styrene Information and Research Center does not agree with the classification as it did not include a review of all available data. SIRC states: “HHS included styrene in the 12th RoC despite the fact that European Union regulators have determined styrene does not represent a human cancer concern. E.U. scientists reviewed the full styrene database, weighing all of the available data in reaching their conclusion.”

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 workplace 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 Safety Data Sheet for each product (identified by product number) before using. If unavailable, these can be obtained, free of charge, from your Polynt representative or from: Polynt, 99 East Cottage Avenue, Carpentersville, IL 60110, 800-322-8103.

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.**

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