

POLYCOR®

998 Series

Enamels

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Description

CCP's POLYCOR® 998 Series Enamels are formulated to be used as topcoats on fiberglass laminates. Enamels are very similar to gel coats except they cure tack-free on the open surface. Enamels are used to seal and hide a substrate. Normally they are used as interior finishes and yield a pigmented surface.

POLYCOR® 998 Series Enamels were primarily developed for marine applications; however, they can be used in any FRP application where high performance characteristics are desired.

POLYCOR® 998 Series Enamels produce a hard, tough, durable coating that reduces maintenance on composites parts. POLYCOR® 998 Series Enamels cure to a flat finish. Standard enamels should not be used for water immersion service due to potential water spotting and water blistering. Contact a CCP sales representative for a recommendation if water immersion is required.

POLYCOR® 998 Series Enamels meet the EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) for both Marine Manufacturing and Reinforced Composites Production.

POLYCOR® 998 Series Enamels contain wax. The wax is essential to yielding a tack-free surface in the top coating application. The wax also helps to suppress the volatile organic compounds emitted in to the air. Together the low VOC or HAP content and wax results in:

- Reduced monomer emissions
- Less odor
- Smother sprayed film (less orange peel)
- Less over-spray

Due to the wax, POLYCOR® 998 Series enamels should not be used as an in-mold coating where they will be backed by laminate or other materials. Delamination could occur.

Enamels require only the addition of the proper amount of the appropriate methyl ethyl ketone peroxide to cure.

These enamels are available in white or any of the colors listed in the standard gel coat color card. Special colors are available upon request.



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Typical Liquid Properties (77°F)

Liquid properties of POLYCOR® 998 Series Enamels are shown below. 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 results. Products outside of these readings can perform acceptably. Final suitability of this product is in the end use performance.

Test	POLYCOR® 998 Series
Flash Point	82 - 88°F
Hazardous Air Pollutants	Refer to MSDS
Volatile Organic Compounds	Refer to MSDS
Weight per Gallon	10.0 – 11.5 lbs., depending on color
Viscosity ⁽¹⁾	15,000 cps
Viscosity ⁽²⁾	3,400 cps
Thixotropic Index (2/20)	4.5 – 7.0
Gel Time(3)	10 – 18 minutes depending on product
Sag Resistance	Good at 20 mils
Hide	Typically complete at 10 mils (varies with color)
Tack Free/Dull Gloss Time	60 – 90 minutes
Adhesion Time	4 hours
Solvent Wipe Time	After overnight cure, slight color may be removed but surface will remain tack free

⁽¹⁾Brookfield RVF, spindle #4 @ 4 rpm

⁽²⁾Brookfield RVF, spindle #4 @ 20 rpm

⁽³⁾Method CCP-22-TAS-TM-515.2, 100 g mass, 1.8% Arkema Luperox® DDM-9

Application

POLYCOR® 998 Series Enamels should be mixed prior to use. Use mixing equipment with sufficient horsepower (relative to container size) to achieve thorough circulation from top to bottom and out to the sides of the container. The agitator must be properly sized for the container and must allow for uniform mixing regardless of the liquid level in the container. Mixing once a day for 10 minutes is typically sufficient. Air

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bubbling should not be used for mixing. It is not effective and only serves as a potential source of water or oil contamination.

Do not over mix POLYCOR[®] 998 Series Enamels. Over mixing can break down the coating viscosity increasing the tendency to sag. Over mixing can also result in styrene loss which could contribute to porosity. Air bubbling should not be used for mixing. It is not effective and only serves as a potential source of water or oil contamination.

Recommended application of enamels is by spraying, but they can be rolled. Brushing is not recommended due to poor flow and leveling. POLYCOR[®] 998 Series Enamels should be applied after the laminate has cured and while it still has a tacky surface. Glossy/resin rich laminates may cause the enamel to separate, sag, and have poor adhesion. Ensure that glossy areas are well sanded, then blow off the area and clean with solvent.

Laminates containing a “wax surface” or “mold release” should be sanded before coating with POLYCOR[®] 998 Series Enamels. Sand with coarse sandpaper to remove all indications of wax or mold release, then wash with solvent.

If a *fleck coat* or *cob webbing* of POLYCOR[®] enamel is desired over the base coat of enamel, it should be applied while the base coat is wet.

Spray equipment must be well maintained and regularly calibrated. Application procedure recommendations should be followed carefully. Poorly maintained equipment or poor application will quickly negate the beneficial properties of POLYCOR[®] 998 Series Enamels. Refer to CCP's [Composites Application Guide](#), for equipment and application recommendations. Use the same equipment, settings, and techniques for spraying enamels as used for gel coats.

When establishing the fan pattern for the spray equipment, use the lowest pump pressure needed to achieve a good fan pattern (no fingers or tails, uniform particle size of about 1/16”). Use of higher pressures can lead to a porosity or excessive overspray.

Overspray can result in a leathery or chicken skin texture if it falls on the part surface. To minimize overspray that falls onto the mold, plan the spray pattern so that the beginning is closest to the vapor/air exhaust and progresses to the opposite mold end. The spray pattern should also allow for a wet line to be maintained.

A spray distance of 18 to 36 inches is recommended. Closer spray distances can result in blowing of the film or air entrapment. Spraying at distances greater than 4 feet will increase orange peel and porosity. For deep channels, recessed, and hard-to-spray areas, an extension nozzle is highly recommended.

CCP does not recommend fluid lines longer than 50 feet, or pumps smaller than 20:1 ratio. CCP recommends a gel coat delivery rate of no more than 2.5 pounds per minute with conventional air atomized equipment, and no more than 4 pounds per minute with airless equipment.

For optimum results, uniform catalyst mix must be achieved. Even with the equipment properly calibrated, potential problems can occur due to poorly atomized catalyst; surging problems (gel coat or catalyst); poor tip alignment (catalyst to gel coat mix); contamination; and poor application procedures, which will quickly negate all benefits of calibration. The equipment (and application procedures) must be monitored on a routine basis to ensure proper application and cure of the gel coat. Inquire about and adhere to all equipment

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manufacturers' recommendations.

Avoid overspray settling on mold surfaces by beginning the spray pattern closest to the vapor/air exhaust and progressing to the opposite mold end. Maintain recommended spray distances from the mold surface.

For best overall performance properties, a wet film thickness of 18±2 mils is recommended as ideal. Films less than 12 mils may not cure properly, may be hard to patch, and are more susceptible to water blisters. Films above 24 mils may trap porosity or crack, and are more subject to weathering discoloration.

One gallon of POLYCOR® 998 Series Enamel will cover approximately 60 to 80 square feet, depending on the film thickness of the coating.

Cure

It is recommended that gel time be checked in the customer's plant because age, temperature, humidity and catalyst will produce varied gel times. All data referencing gel or cure refers specifically to Arkema Luperox® DDM-9 catalyst. United Initiators Norox® MEKP-9 and Norox® MEKP-9H, Akzo Nobel CADOX L-50a and CADOX D-50 are expected to yield similar performance. Arkema Luperox® DHD-9, Norox® MEKP-925 and Norox® MEKP-925H, and Pergan HP-90 can also be used, but gel and cure times will vary.

The recommended catalyst range is 1.2% to 3.0% with 1.8% at 77°F being ideal. Normally, POLYCOR® 998 Series Enamels will cure tack free in 60-90 minutes. This time element is dependent on material temperature, room temperature, humidity, air movement, and catalyst concentration.

Enamels should NOT be applied when the temperature is below 70°F; inadequate cure can result.

Caution

Spray and pumping equipment must be completely clean of other gel coat and resin products before using POLYCOR® 998 Series Enamels.

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

Storage

POLYCOR® 998 Series Enamels have a usage shelf life of 90 days from date of shipment from CCP when stored at 73°F or below in a closed, factory-sealed, opaque container, and out of direct sunlight. The usage life is cut in half for every 20°F over 73°F.

Data Sheets/MSDS

Available in printable format online at www.ccpcompositesus.com.

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.



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