



# ARMORCOTE®

## 966 Series Metallic Gel Coats

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### Description

ARMORCOTE® 966 Series metallic gel coats are used in passenger, camper, utility, and recreation vehicles, decorative structural components, and for marine vehicle surfaces above the water line (not recommended for water immersion service). ARMORCOTE® 966 Series is Polynt Composites' best system for weathering resistance in a metallic gel coat

ARMORCOTE® 966 Series meets the EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) for both Marine Manufacturing and Reinforced Composites Production.

### Typical Liquid Properties (77°F)

These values may or may not be manufacturing control criteria; they are listed as a reference guide only. Particular batches may 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. Gel coats with properties outside of these ranges can perform acceptably.

Test	ARMORCOTE® 966 Series
Viscosity <sup>(1)</sup>	14,500 cps
Thixotropic Index	5.5
Weight per Gallon	10.0 lbs.
Flash Point	79°F
Gel Time <sup>(2)</sup>	15.5 minutes
Lay-up Time	67.5 minutes
Sag Resistance	Good @ 24 mils wet
Hide	Normally complete @ 10 mils

<sup>(1)</sup> Brookfield RVF #4 Spindle @ 4 rpm

<sup>(2)</sup> Arkema Luperox® @ 1.8% DDM-9

Hide will vary depending on the color and metallic effect desired. Some colors of gold, red and dark blue may be incomplete in hide at 20 mils wet and require a backup to impart hide. Ask a Polynt Composites Representative about specific formulations.



## Application

ARMORCOTE® 966 gel coats must be mixed prior to use. This includes prior to production spray application and when obtaining material for patching or any material that has been set aside for patching. Several suitable types of mixing equipment and styles of agitators are available for both pails and drums. Regardless of the specific type used, the equipment must have 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. Do not overmix ARMORCOTE® 966 gel coats. Overmixing can break down the polymer coating viscosity increasing the tendency to sag. Overmixing 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.

Metallic gel coats are formulated for spray application. Brushing or rolling is not recommended.

Flakes of aluminum, bronze, coated mica, copper, glass, iron oxide, and thermoplastic or thermoset plastic are used to impart metallic effects. Type, size, concentration, orientation, transparency and opacity of the flakes, along with the presence of dyes or pigments, contribute to the overall color and appearance of metallic gel coats.

Changes in the setup of the spraying equipment and/or application technique lead to different metallic color shades and patterns. To reproduce the metallic color, it is essential that the following be kept constant: spray equipment, pot pressure, atomization pressure, and distance at which the spraying is done.

If the patterns of the metallic gel coat on the finished part are not satisfactory, a dust coat approach could be used. The dust coat should be *consistent and uniform*. A heavy dust will yield a different effect than a light dust. If the gel coat is sprayed to an extremely inconsistent dust coat, the different effects will be noticeable. Three to four minutes interval should be allowed before the final spray is applied to achieve the desired film thickness.

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. Ask about and adhere to all equipment manufacturers' recommendations.

For best overall performance properties, a wet film thickness of  $18 \pm 2$  mils is recommended as ideal. Films less than 12 mils may not cure properly, may be hard to patch, have more print-through, and be more susceptible to water blisters. Films above 24 mils may pre-release, trap porosity, crack and are more subject to weathering discoloration. If weathering (yellowing from sunlight, decks) is of great concern, thinner films (12 to 16 mils) would perform better, but patchability, print-through and blister resistance could suffer.

Proper mold maintenance is important. Minimal repair work is always desirable. Sanding and compounding can hasten the chalking and loss of gloss of all gel coats.

Patching metallic gel coats is very difficult and patches will likely be more noticeable than those for solid colors. Fabricators may have to be content with some color and appearance differences between the patch and surrounding area, due to the sanding/polishing disturbance of the metallic pigments.



## 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 Chemtura HP-90 may yield slightly shorter gel and cure times.

The catalyst level should not exceed 3.0% or fall below 1.2% for proper cure. Recommended range is 1.2% to 3.0% with 1.8% at 77°F being ideal. Normally, the gel coat film is ready for lamination in 45 to 90 minutes. This time element is dependent on material temperature, room temperature, humidity, air movement, and catalyst concentration. Special fast-cure versions are available but must be requested. These products offer lay-up times of 30 minutes or less depending on gel times. Fast cure products have shorter stability and should not be inventoried more than 45 days.

These products (standard or fast cure) should not be used when temperature conditions are below 60°F, as curing may be adversely affected.

## Precaution

Metallic gel coats may contain aluminum pigments. Precautions of aluminum pigment-containing products must be exercised. Wearing gloves is recommended when working with these products. Small spills and drops should be cleaned immediately before the concentrate contaminates and spreads in the working area. All equipment should be well grounded. Chlorinated solvents in contact with aluminum can cause an explosion; refrain from cleaning the metallic spray equipment with such solvents.

## Exposure Performance

Metallic gel coats expose similarly to conventional solid gel coat colors. Chalk development and gloss loss will vary with the metallic content. High metallic content gel coats may demonstrate more rapid chalk development than others. Ask a Polynt Composites Representative about specific formulations.

## Caution

ARMORCOTE® 966 gel coats will not correspond in color to gel coats in Polynt Composites other series with similar codes. For example, 966-N-001 will not be the same color as Polycor® 944-N-001 or 943-N-001. This is due to the variety of metallic effects that can be used in any specific color.

Metallic gel coats are not compatible in the liquid state with isophthalic or ISO/NPG gel coats or resins. Spray and pumping equipment must be completely clean of these gel coats or resins before metallics can be used.

Do not add any material, other than recommended methyl ethyl ketone peroxide, to these products without the advice of a representative of the Polynt Composites.

## Storage

ARMORCOTE® 966 gel coats will have a shelf life of 60 days depending on the type of metallic pigment used. All shelf lives are from the date of manufacture. Consult a Polynt Composites representative for the shelf life of a particular product.



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Shelf lives are for uncatalyzed products stored at 73°F or below, in a closed, factory sealed, opaque container and out of direct sunlight. Shelf life is cut in half for every 20°F over 73°F. Totes of product can have even shorter shelf life – 66% of that for drums.

### **Related Products**

Polynt Composites recommends the use of PATCHAID® when patching ARMORCOTE® 966 gel coats. Please see the technical data sheets for Polynt Composites' PATCHAID® 970XJ037, 970X900, 970XJ166 and 970XA014 products.

### **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 Composites USA Inc. and described herein, are made solely on condition that Polynt Composites USA 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 Composites representative or from: Polynt Composites USA Inc., 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.**

## LIMITED WARRANTY AND LIMITATION OF LIABILITY

### LIMITED WARRANTY.

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 for the product; 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 ADDITIONAL REPRESENTATIONS OR SUGGESTIONS REGARDING THE PRODUCT OR ITS POSSIBLE USES ARE BASED UPON SELLER'S GOOD FAITH OPINION AND BELIEF, BUT ARE NOT TO BE CONSTRUED AS AFFIRMATIONS OF FACT, PROMISES, OR DESCRIPTIONS, AND SHALL IN NO WAY BE DEEMED PART OF THE SALE OF PRODUCT.** In particular, and without limiting the foregoing, because of environmental and use conditions beyond Seller's control, Seller offers no warranty and makes no promise concerning the results that may be obtained by the Buyer (or the Buyer's customer) with the product or the performance of the product. Each user should satisfy itself, by adequate testing, of the suitability of the product for its particular application.

### LIMITATION OF LIABILITY.

- (a) Seller's total liability for any claim arising out of or in connection with this contract, including for breach of contract, warranty, statutory duty, or for other tort, including seller's negligence, shall not exceed the purchase price 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 LIMITATION LOSS OF PROFITS, CAPITAL OR BUSINESS OPPORTUNITY, DOWNTIME COSTS, OR CLAIMS OF CUSTOMERS OR EMPLOYEES OF BUYER, WHETHER IN AN ACTION UNDER CONTRACT, NEGLIGENCE OR ANY OTHER THEORY, ARISING OUT OF OR IN CONNECTION WITH THIS CONTRACT, OR THE USE, INABILITY TO USE, OR PERFORMANCE OF THE PRODUCT.**
- (b) If Seller furnishes technical or other advice to Buyer, whether or not at Buyer's request, with respect to processing, further manufacture, other use or resale of the products, Seller shall not be liable for, and Buyer assumes all risk of, such advice and the results thereof.

The information provided is believed to be accurate at the time of preparation, or prepared from sources believed to be reliable, but it is the responsibility of user to investigate and understand other pertinent sources of information, to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use.