



PCT100, PCT110 Series

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Polynt Composites' **IMEDGE**® products are high performance **In-Mold** cutting **EDGE** polymer technologies that offer unique and revolutionary alternatives to conventional FRP materials. The IMEDGE® technologies were developed to promote and drive innovation in the FRP industry. The IMEDGE® product line represents Polynt Composites' commitment to be a leader in the industry through technology, sales, technical and customer support.

Description

IMEDGE® PCT100 and PCT110 coatings are advanced **Polymer Coating Technology (PCT)** products that have been formulated to be used as in-mold, exterior coatings for reinforced plastic parts.

Features and Benefits

- Deep, dark, rich, high gloss colors
- Excellent color and gloss recovery after sanding and buffing
- Exceptional water resistance
- Excellent blush resistant
- IMEDGE® PCT100 has excellent weathering resistance
- IMEDGE® PCT110 has *exceptional* weathering resistance
- Enhanced impact resistance and toughness for reduced cracking
- Excellent scratch and wear resistance
- Resistant to porosity
- Low weight per gallon

IMEDGE® PCT100 and PCT110 coatings are formulated to meet EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) for both Boat Manufacturing and Reinforced Plastic Composites products.

When IMEDGE® PCT100 and PCT110 are backed by IMEDGE® High Performance Barrier Coat (HPB), ArmorGuard® vinyl ester barrier coat products, or ArmorStar® vinyl ester skin resins, a durable osmotic blister resistant composite can be made that is suitable for applications with extended water exposure.

IMEDGE® PCT100 and PCT110 coatings are durable and crack resistant. When used in combination with IMEDGE® HPB the resulting composite has exceptional crack resistance.

While offering these benefits, IMEDGE® PCT100 and PCT110 coatings have retained the important construction and application qualities expected from Polynt Composites coatings, such as resistance to tearing and color separation, sag resistance, consistent liquid properties, and more. These add up to higher quality appeal in FRP parts made with IMEDGE® PCT100 and PCT110 Series products.



Typical Properties (77°F)

Typical properties of IMEDGE® PCT100 and PCT110 are shown below. These values may or may not be manufacturing control criteria. They are listed for reference 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 test results. Products outside of these readings can perform acceptably.

Test	PCT100	PCT110
Viscosity ⁽¹⁾	9,000-13,000 cps	9,000-13,000 cps
Thixotropic Index	4.0-6.0	4.0-6.0
Flash Point	79-82°F	79-82°F
Weight per Gallon	8.70-9.70 lbs depending on color	8.70-9.70 lbs depending on color
Gel Time ⁽²⁾	12-20 minutes	12-20 minutes
Lay-up Time	60-80 minutes	90-160 minutes
Sag Resistance	Good at 20 mils	Good at 20 mils
Hide (most formulations)	Complete at 10 mils	Complete at 10 mils

⁽¹⁾ Brookfield RVF, spindle #4 @ 4 rpm

⁽²⁾ 100 g mass, 1.8% MEKP

Reds, yellows and dark blues may have lower hiding power. Ask a Representative whether your red, yellow or blue requires a special application procedure (e.g. increased film thickness through multiple applications).

Application

IMEDGE® PCT100 and PCT110 must be mixed prior to use. This includes mixing before production spray applications and when obtaining material for patching or any material that has been set aside for patching. When not agitated, IMEDGE® PCT100 and PCT110 develop a viscous layer at the top of the container. The material at the bottom of the container is much lower in viscosity. Material applied in this condition is likely to sag and have porosity. Mixing of IMEDGE® PCT100 and PCT110 coatings is critical to success with the products.

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 to allow for uniform mixing regardless of the liquid level in the container.

Initially, during mixing, the agitator speed and height need to be high enough to break down the top viscous layer. The agitator height will then need to be lowered to achieve thorough circulation from top to bottom in the container. The agitator speed may need to be reduced as the product is mixed. Always visually check the material during and after mixing to ensure that the top viscous layer has been fully re-incorporated.

Do not overmix IMEDGE® PCT100 and PCT110. 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.

PCT100 and PCT110

Polynt Composites USA Inc. - 99 East Cottage Ave. - Carpentersville IL 60110

Customer Service - +1 800 322 8103 phone - +1 847 428 2757 fax - www.polyntcompositesus.com



IMEDGE® PCT100 and PCT110 products are formulated for spray application. Brushing or rolling is not recommended. IMEDGE® PCT100 and PCT110 products can be applied with typical gel coat spray application equipment. Use of external catalyst mix equipment is recommended. Use of internal mix spray equipment increases the potential for porosity.

Actual spray application is similar to conventional gel coats. Refer to Polynt Composites' Composites Application Guide for additional application information. Polynt Composites recommends a 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 low pressure, air assist equipment.

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

For best overall end performance properties, a wet film thickness of 18±2 mils is recommended. Films less than 12 mils may not cure properly, may be hard to patch, have more print-through, and are more susceptible to water blisters. Films above 24 mils may pre-release, trap porosity, or crack, and are more subject to weathering discoloration. If water blisters are of a great concern, 20 to 24 mils would perform better than a thinner film; but sag, porosity and cracking resistance could suffer. If weathering is of great concern, thinner films (12 to 16 mils) would perform better but patch ability, resistance to print-through, and blistering could suffer.

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. Closer spray distances or larger tips may be required in hot weather to avoid dry spray buildup.

Cure

Polynt Composites recommends checking gel time 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 may yield slightly shorter gel and cure times.

The recommended range is 1.8 % to 3.0% with 1.8% at 77°F being ideal. Normally, the coating film is ready for lamination in 60 to 80 minutes. This time element is dependent on material temperature, room temperature, humidity, air movement, and catalyst concentration. If lay-up time is checked by the finger method, slight pressure and dragging should be used. These products should not be used when temperature conditions are below 70°F, as curing may be adversely affected. Please note that the mold temperature should not be below 70°F for adequate cure.



Patching

No matter how much care is taken in producing parts, some will have defects and require repair. The source of defects should always be investigated to determine if they could be prevented. Defect prevention is usually more cost effective than continuously performing repairs. In addition, repairing the exterior coating will nearly always compromise its field performance (e.g. weathering, blush resistance, etc.). See Polynt Composites' Composites Application Guide for general patching and finishing procedures.

Recommended procedures specific to patching of IMEDGE® PCT100 and PCT110 Series products are provided, below. General process steps include preparation of repair area, patching material preparation, spray patch application and finishing. You will need the following Polynt Composites products, as well as typical patching, sanding and buffing materials and tools to make the patch.

- IMEDGE® PCT100 and PCT110 – Use the same batch as used during part manufacture
- FC PATCHAID® 970C961 Spraycure™ – Used as an overspray to seal the patch open side and improve patch cure

Repair Area Preparation

Identify the area to be repaired. Locating repair edges at design lines, break lines or other part features that visually break up the part surface can help hide patches.

Prepare the area to be patched by sanding with 150-grit to 320-grit sand paper. Remove sanding dust. Wipe the area with ethyl acetate, methyl ethyl ketone or other suitable solvent to eliminate wax, oil or other contaminants. Be sure the area to be patched is clean and dry before proceeding. Mask the area surrounding the patch area to prevent overspray from accumulating on part.

Note: See the procedures at the end of the bulletin for steps that can be taken during repair area preparation to reduce halo formation.

Preparation of Patching Material

Obtain a sample of the same batch of IMEDGE® PCT100 or PCT110 that was used to fabricate the part being repaired. Failure to use the same batch will almost certainly result in an off-color patch. Agitate the IMEDGE® PCT100 or PCT110 immediately prior to using the sample. Mixing is needed to obtain a good color match and for spray properties. See the "Application" section above for mixing instructions.

The preferred method of patching is to use the IMEDGE® PCT100 or PCT110 coating with no diluents or additives other than MEKP peroxide initiator. This method yields the best results for both initial patch appearance and long-term field performance.

Spray Patch Application

When ready to spray the patch area, catalyze the patching material with 2.0-3.0% MEK peroxide. Using a Binks 115 type spray gun, spray the catalyzed mix over the entire sanded area. Thickness should be approximately 8 to 12 mils for good cure. If spraying an area where the gel coat has been completely removed, the thickness of the spray patch must be at least equal to the thickness needed for hide.



Use a film coat of FC PATCHAID® 970C961 Spraycure™ to seal the open side of the patch and enhance cure. Apply the Spraycure™ while the patch is still wet (within 5-10 minutes of the patch being sprayed). Keep the area surrounding the patch masked-off when applying Spraycure™. Spraycure™ can reduce the gloss or cause streaking in the surrounding gel coat.

Note: When used as an overspray, Spraycure™ does not require initiator. For Spraycure™ to provide an efficient seal, it must be sprayed as a film rather than a dust coat. Do not flood it on or spray it too thick. After Spraycure™ has been applied remove all tape and masking materials.

Allow the patch to cure for a minimum of 8 hours at room temperature before finishing. Working in temperatures cooler than 77°F may require longer cure times. Before sanding, pre-buff the patch to help drive the cure and then allow the area to cool before finishing.

If circumstances require the patch to cure quicker, the following procedure can be used. Add 5cc's of FC PATCHAID® 970C961 Spraycure™ to 100 grams of IMEDGE® and catalyze with 2.5cc's of catalyst. Overspray patch wet on wet with Spraycure™, heat the patch for 10-minutes and allow to cure for 2 hours. When the patch is ready do not wipe patch with acetone, instead, wet sand first with 400-grit sand paper and then follow up with the typical dry sanding (600, 800, 1000, 1200 DA) and finishing sequencing detailed below.

Finishing

Sand the patch using a sequence of increasingly finer grit sandpapers. A recommended sequence is using a DA (dual action) sander starting with 400-grit, then progressing to 600-grit, 800-grit, 1000-grit, and even 1200-grit. Wipe off sanding dust in between each step.

Start buffing using a clean 100% wool pad using a medium grit compound. Polynt Composites has found that 3M™ Perfect-it™ III Compounding Pad with Imperial™ Compound and Finishing Material quickly removes scratches left by 800-grit sandpaper with the least amount of buffing and residual haze. Use this type of buffing pad and compound or its equivalent. Ideal buffing speeds are from 1700 rpm to 2400 rpm.

Always precondition a new/clean pad by pre-buffing with compound at a low rpm in order to 'wet' the fibers of the pad. Do not use excessive buffing pressure. Let the weight of the buffer do the work. Use plenty of compound to lubricate and cool the gel coat surface. As the compound begins to dry out, lighten up on the buffer. 'Spur' the buffing pad when it starts to glaze over or change to a new preconditioned pad. For best results, keep the buffing pad flat on the surface being buffed. Tilting the buffer can introduce swirl marks. Wipe or wash off all loose compound and grit. The IMEDGE® PCT100 or PCT110 coating may leave some 'coloring' on the buffing pad. This is a function of the pigment used and is not an indication of the degree of cure.

If needed, the patch area can be polished for added gloss. Use a clean white foam waffle pad and medium grit compound. Polynt Composites has found that 3M™ Perfect-it™ Foam Compounding Pad with 3M™ Finesse-It™ II Compound and Polishing Material gives good results. Use this type of polishing pad and compound or its equivalent. Slow buffer speed to 1500-2000 rpm. It is also critical to keep the compound wet on the repair area to prevent re-scratching the surface. Water can be added for this purpose. After buffing, thoroughly wipe the area to remove all traces of finishing glaze and residue. Wax the patch area using a light-stable exterior protective paste wax.

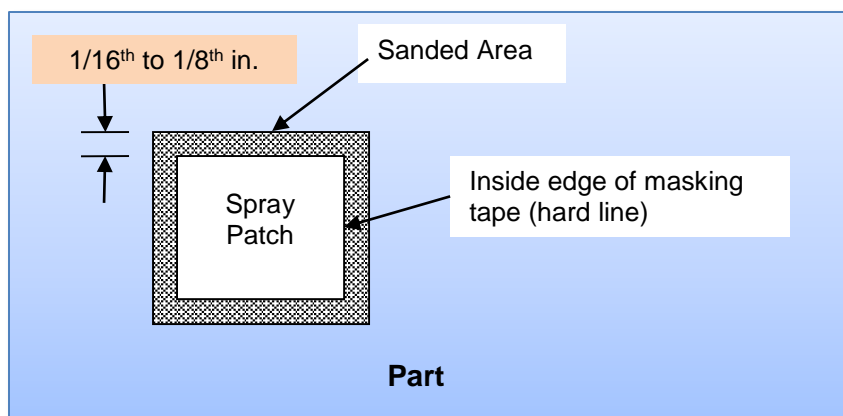
Halo Reduction

The occurrence of a halo or a dark rim around the patch is a common issue encountered when patching. Steps to reduce the incidence of halos are specified *below*.

PATCH, PREP. AND SPRAY:

1. Use a coarse grit sand paper (150 to 180) to prepare the repair area.
2. Sand to a hard line at the edge of the repair area.
3. A hard line for sanding can be created with masking tape by putting a tapeline approximately 1/16th to 1/8th inch inside of the sanding preparation area (Figure 1). Spraying the patch to the tape edge will create a spray line (hard line) on tape removal. Rectangular patch areas allow for easier tape layout however, other patch area geometries such as a parallelogram, can be used.

Square shape repair



Parallelogram shape repair

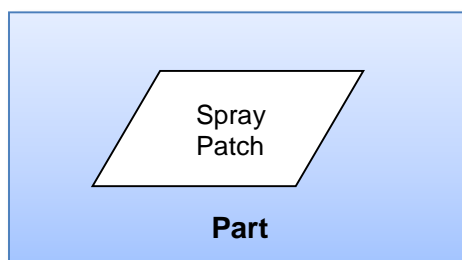


Figure 1. Schematic of spray patch preparation

Apply Spraycure™ 970C961, remove all tape and masking materials, and allow patch to cure as described in the “Spray Patch Application” section.



FINISHING:

1. The same sanding sequence from 400-grit through 1200-grit as detailed in the standard finishing sequence will be used. Start with a coarse 400-grit sandpaper and Dual Action (DA) sander, focus sanding on the center of the patch out beyond the patch edge by 0.5 to 1.0 inch. This will sand out the marks from the original 150-to 180 grit prep sanding and begin sanding down the Hard Line. Be careful not to concentrate sanding directly on the patch edge and Hard Line, as this will create a depression that frames the patch area. Sand with 400-grit sandpaper until the patch area is evenly smooth and the patch edge (Hard Line) is barely detectable by feel. Be careful not to sand patch edge (Hard Line) all the way down as this is the goal of the subsequent finer grit sanding steps and ideally occurs with the final sanding step.
2. Continue sanding with finer grits (600, 800, 1000, 1200-grit) and eventually buffing and polishing. With succeeding finer grit sandpapers, the repair edge will be moved out a little further, by 0.5 to 1.0 inch each time. Each succeeding finer grit needs to sand out the marks of the previous coarser grit. The original 2x2 inch patch can grow to a 5x5 inch area by the completion of the sanding process.

Caution

IMEDGE® PCT100 and PCT110 Series products may not be compatible in the liquid state with certain isophthalic coatings or with isophthalic resins. Spray and pumping equipment must be completely clean of these coatings or resins before the IMEDGE® PCT100 and PCT110 Series can be used.

Do not add any material, other than the recommended methyl ethyl ketone peroxide, to this product without the advice of a representative of Polynt Composites. Under no circumstances should glycerin be added to these products.

Storage Limitations

Uncatalyzed, IMEDGE® PCT100 and PCT110 products have a shelf life of 120 days from date of manufacture when stored at 73°F or below, in a closed, factory sealed, opaque container, and out of direct sunlight. Fast cure gel coats (gel time less than 9.0 minutes) have a shelf life of 60 days. The 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.

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.