



ECT120 Series

Epoxy Compatible Technology

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CCP's **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 CCP's commitment to be a leader in the industry through technology, sales, technical and customer support.

Description

IMEDGE[®] ECT120 coatings are advanced Epoxy Compatible Technology (ECT) products that have been formulated to be used as in-mold, exterior coatings for reinforced plastic parts. Unique benefits of IMEDGE[®] ECT120 coatings are:

- Excellent adhesion to epoxy matrix laminates
- Deep, dark, rich, high gloss colors
- Excellent color and gloss recovery after sanding and buffing
- Blush resistant
- Excellent weathering resistance.
- Enhanced impact resistance and toughness for reduced cracking
- Excellent scratch and wear resistance
- Resistant to porosity
- Low weight per gallon

IMEDGE[®] ECT120 coatings are formulated to meet EPA's National Emission Standards for Hazardous Air Pollutants (NESHAP) for both Boat Manufacturing and Reinforced Plastic Composites products.

IMEDGE[®] ECT120 coatings offer exceptional water resistance and durable and crack resistant. While offering these benefits, IMEDGE[®] ECT120 coatings have retained the important construction and application qualities expected from CCP coatings, such as resistance to tearing and color separation, sag resistance, consistent liquid properties, and more. These all add up to higher quality appeal in FRP parts made with CCP IMEDGE[®] ECT120 Series products.

Typical Properties (at 77°F)

Typical properties of IMEDGE[®] ECT120 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

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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	Value
Viscosity, Brookfield RVF #4 Spindle @ 4 rpm	7,500 – 9,500 cps
Thixotropic Index (2/20)	4.5 – 6.0 (colors)
Flash Point	80°F - 84°F
Hazardous Air Pollutants	See MSDS for amounts
Volatile Organic Compounds	See MSDS for amounts
Weight per Gallon	8.9 – 9.5 lbs., depending on color
Gel Time ¹	11 – 15 minutes
Lay-up Time	45 – 60 minutes
Sag Resistance	Good at 20 mils
Hide (Most Formulations)	Complete at 15 mils

¹100 g mass, 1.8% Arkema Luperox[®] DDM-9

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

Refer to the MSDS for handling precautions. MSDS's will be supplied automatically with the first order for material, and are available by product code upon request from CCP's Regulatory Department or on CCP's website at www.ccpcompositesus.com.

Application

IMEDGE[®] ECT120 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. When not agitated, IMEDGE[®] ECT120 develops 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[®] ECT120 is critical to success with the product.

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.

During mixing, the agitator speed and height initially needs to be high enough to breakdown the top viscous

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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.

Mixing once a day for 10 minutes is typically sufficient. Do not over mix IMEDGE[®] ECT120. Over mixing can break down the polymer 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.

IMEDGE[®] ECT120 products are formulated for spray application. Brushing or rolling is not recommended. IMEDGE[®] ECT120 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 CCP's *Composites Application Guide* for additional specific application information. 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 IMEDGE[®] ECT120.

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 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 (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.

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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. Syrgis 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.

Recommended range is 1.2% to 3.0% with 1.8% at 77°F being ideal. Normally, the coating film is ready for lamination in 45 to 60 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 60°F, as curing may be adversely affected.

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 can be prevented. Defect prevention is nearly always more cost effective than continuously performing repairs. In addition, repairing the exterior coating will nearly always compromise its field performance (weathering, blush resistance, etc.). See CCP's *Composites Application Guide* for general patching and finishing procedures.

Recommended procedures specific to patching of IMEDGE[®] ECT120 products are provided below. The general process steps are repair area preparation, patching material preparation, spray patch application and finishing. You will need the following CCP products, as well as typical patching, sanding and buffing materials and tools to make the patch.

- IMEDGE[®] ECT120 – Use the same batch as used during part manufacture.
- SPRAYCURE PATCHAID[®] 970C961 – 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 that 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.

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Preparation of Patching Material

Obtain a sample of the same batch of IMEDGE[®] ECT120 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[®] ECT120 immediately prior to obtaining the sample. Mixing is needed to obtain a good color match and also for spray properties. See the Application section above for mixing instructions.

The preferred method of patching is to use the IMEDGE[®] ECT120 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. The addition of diluents or additives to the coating prior to patch application can result in hazy and/or dull patches. Do not use solvents (acetone, MEK, ethyl acetate or any of the replacement solvents or cleaners) to dilute the IMEDGE[®] ECT120 coating.

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 SPRAYCURE PATCHAID[®] 970C961 to seal the open side of the patch and enhance cure. Apply the SPRAYCURE PATCHAID[®] 970C961 while the patch is still wet (within 5-10 minutes of the patch being sprayed). Keep the areas surrounding the patch masked-off when applying the

SPRAYCURE PATCHAID[®] 970C961. The SPRAYCURE PATCHAID[®] 970C961 can reduce the gloss or cause streaking in the surrounding gel coat.

Note: When used as an overspray, SPRAYCURE PATCHAID[®] 970C961 does not require initiator. For SPRAYCURE PATCHAID[®] 970C961 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 PATCHAID[®] 970C961 has been applied, remove all tape and masking materials.

The preferred method of curing the patch is to heat the patch area using an infrared lamp. Heat should be applied to the patch within 10 minutes of spray. Setup the lamp to maintain the patch area at 110-120°F. At this temperature, the patch area should be just warm to the touch. Do not overheat the patch or surrounding part. Use of heat can cause additional surface distortion and fiber pattern near the patched area. Maintain the patch area at temperature for 1 hour. Let cool before finishing.

If unable to heat the patch area, 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.

Finishing

Sand the patch using a sequence of increasingly finer grit sandpapers. A recommended sequence is 400-grit, 600-grit and 800-grit. For best results sanding should be done by hand with the 400-grit step done dry to

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remove any orange peel and the 600-grit to 800-grit steps done wet. A dual action sander can also be used. Wipe off sanding dust in between each step. After sanding with 800-grit sand paper, use water to remove all loose dust and grit.

Start buffing using a clean 100% wool pad using a medium grit compound. CCP 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 low RPM's 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® ECT120 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. CCP 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 halo or a dark rim around the patch is a common issue encountered when patching. Some steps that can be taken to reduce halo are as follows:

1. Use a coarser grit sand paper (150 to 180) to prepare the repair area.
2. Sand to a hard line at the edge of the repair area. A hard line for sanding can be created with masking tape.

Spray the patch to a hard line. The patch edge should be slightly inside of the sanded area. A hard line for patch spray can be created by putting a tapeline approximately 1/16th to 1/8th inch inside of the sanding preparation area hard line. An example is shown in Figure1.

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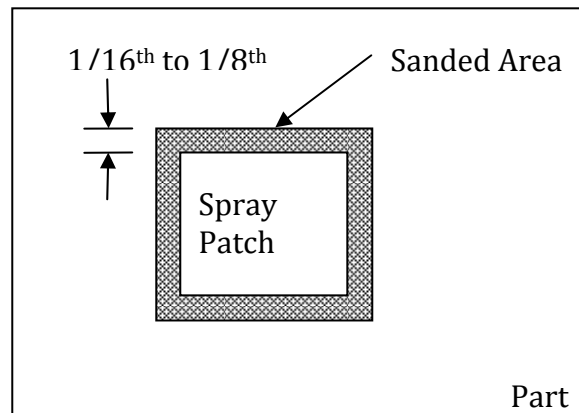


Figure 1. Schematic of Spray Patch Preparation

3. Remove all tape and masking materials. Allow patch to cure as described in the Spray Patch Application section.
4. Start sanding with a coarser grit (400-grit dry) and focus on the center of the patch. Be careful not to concentrate directly on the patch edge since this will create a depression that frames the patch area. Using the coarser grit, sand from the center of the patch out to beyond the patch edge by 0.5 to 1.0 inch. The purpose is to use the 400-grit to sand out the marks of the original 150 to 180-grit used to prep the patch area. Continue sanding with the coarser grit until the patch area is evenly smooth and the patch edge is barely detectable by feel – meaning there is no raised bump going from the non-patch area to the patch area.
5. Continue sanding with finer grits (600 and 800-grit wet) and eventually buffing and polishing. With each succeeding finer grit sandpaper, 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.
6. Continue sanding with finer grits (600 and 800-grit wet) and eventually buffing and polishing. With each succeeding finer grit sandpaper, 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[®] ECT120 Series products may not be compatible in the liquid state with other coatings or resins. Spray and pumping equipment should be completely clean of other coatings or resins before the IMEDGE[®] ECT120 Series can be used.

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. Under no circumstances should glycerin be added to these products.



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Storage Limitations

Uncatalyzed, IMEDGE® ECT120 Series products have a usage life of 120 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. Totes of product can have even shorter usage life—66% of that for drums.

Data Sheets/MSDS

CCP data sheets and MSDS's are available in printable format at www.ccpcompositesus.com.

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**CCP COMPOSITES US
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.