

STYPOL[®]

945BJ115 and 945YJ071 Vinyl Ester Tooling Gel Coats

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Type

945BJ115 and 945YJ071 vinyl ester tooling gel coats are formulated specifically for mold making. These precision-formulated gel coats utilize a selected vinyl ester resin that exhibits high heat distortion to withstand the repeated moldings of FRP laminates. These products do not contain lead. They are formulated to provide abrasion resistance, excellent gloss retention, high heat distortion and extended mold life. They are ready-to-spray after the addition of the proper amount of an appropriate methyl ethyl ketone peroxide catalyst. Read application instructions and PB-5 (Polyester tooling) Bulletin, carefully, because even though manufacturing precautions are used to make tooling gel coat, a misapplication of this product can produce unacceptable results.

Typical Properties (at 77°F)

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 test results. Gel coats with properties outside of these ranges can perform acceptably.

Test	945BJ115 (Black)	945YJ071 (orange)
Viscosity—Brookfield RVT #5 spindle @ 20 rpm	4,250-5,250 cps	4,250-5,250 cps
Thixotropic Index (10/100)	5.0-7.0	5.0-7.0
Flash Point	88°F	88°F
Hazardous Air Pollutants	*See MSDS for information	*See MSDS for information
Volatile Organic Compounds	44-46%	41.3-43.3%
Weight/Gallon (lbs)	8.95-9.05	9.04-9.14
Gel Time (minutes) with 2.0% HP-90	15-21	15-21
Lay-up Time (minutes)	60-90	60-90



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Hide (complete)	4-9 mils (wet)	22-29 mils
Color Match, Maximum CMC DE of	1.5 units	2.0 units
Barcol Hardness*	25-35	25-35
Heat Distortion Temperature		
One week after post cure	144°F	144°F
One week after post cure of 150°F for 16 hours	189°F	189°F

*Barcol readings are very sensitive to catalyst/mass/temperature. To help overcome this sensitivity, Barcol should be checked by: 1. Adjusting the tooling gel coat to 77°F; 2. Catalyzing at 2.0%; 3. Weighing 50 g in an aluminum weighing dish and on an insulated surface.; and 4. Maintaining 77°F ambient temperature.

Final determination (numbers) should be achieved in 75 minutes using the Model #934 Barcol Impressor. We have found it very erroneous to check Barcol on a film of tooling gel coat (any film of gel coat) because of the inaccuracies received by the Barcol needle penetrating inconsistent gel coat film thicknesses.

Applications

Tooling gel coats are applied to the part/plug to be duplicated. Care must be taken when preparing the plug with wax and parting film to permit positive release. Best results are obtained by applying two coats at plus or minus 18 mils wet each, and allowing the gel coat to gel and cure between coats. Apply each coat with a minimum of two passes; three passes are preferred. For best results, ensure that the tooling gel coat is allowed to “breathe” for two minutes between each pass. Do not allow over-spray and thin passes to go beyond 5 minutes without cover with a fresh pass. Do not apply over 20 mils per coat, as this can result in crazing and cracking of the gel coat film after use. Do not apply less than 12 mils per coat, as poor cure can result in dulling of the mold in use. Thinner films will also exhibit more print-through and distortion. It is essential that no more than 40 mils (wet) total be applied with any of the tooling gel coats.

Our vinyl ester tooling gel coats are formulated for conventional spray application. Brushing is not recommended. Best results are obtained using pressure pot spray equipment and batch mixing. The following equipment is recommended (**Airless equipment is not recommended**).

Binks Equipment	De Vilbiss Equipment
Fluid Nozzle 66 or 67	Gun P-JGA-502
Air Nozzle 63 PB or 67 PB	Nozzle Combination 704-E
Needle 65067	More than 17 C.F.M required
More than 13 C.F.M. required	

Do not spray more than 2.5 lbs per minute of tooling gel coat. A minimum of 60 psi atomizing pressure

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(measured at the gun with fan full open) should be used to properly atomize the tooling gel coat.

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 Crompton HP-90 catalyst. Norac NOROX MEKP-925 and NOROX MEXP-925H are expected to yield similar performance.

As the material ages, it may encounter slightly longer gel times. The longer gel time will extend the casting Barcol time out longer, but the eventual Barcol should achieve the numbers listed on page 2.

Do not use more than 2.5% catalyst in the tooling gel coat, as this can cause excessive shrinkage of the gel coat and pull-away from the plug. For adequate cure, do not use less than 1.5%

Normally, tooling gel coats are ready to lay-up on (or spray with a second coat of gel coat) in 60-90 minutes, the time element being dependent on room temperature, air movement, humidity, catalyst type and concentration, and spray atomization.

For best results, it is recommended that the temperature be above 70°F.

When using conventional tooling resin, the gel coat should not be left overnight before being laminated onto, as the gel coat may pre-release and/or lose its tack and not provide a good bond between the gel coat and laminate. **If using a low shrink/filled laminate system (follow lay-up time recommendations for the system you're using. Application temperature and lay-up time recommendations will vary.**

Caution

- **These products are made with a vinyl ester base polymer. UV and moisture resistance will be limited. It is recommended that molds stored outside are protected from UV and moisture exposure. This may be accomplished by covering the mold or inverting the mold so that the surface is not exposed to UV and that moisture cannot collect on the mold.**
- 945BJ115 and 945YJ071 are not compatible in the liquid state and isophthalic or ISO/NPG gel coats or resins. Spray and pumping equipment must be completely clean of these products before 945BJ115 and 945YJ071 can be used.
- Do not over-mix. Over-mixing breaks down gel coat viscosity, increasing tendencies to sag, and causes styrene loss, which could contribute to porosity. The gel coat should be mixed once per day for 10 minutes. The gel coat should be mixing to the sides of the container with the least amount of turbulence possible. Air bubbling should not be used for mixing. It is not effective and only serves as potential for water or oil contamination.
- Do not add any material, other than a recommended methyl ethyl ketone peroxide, to these products without the advice of one of our representatives.
- The prime reason for using tooling gel coats for the manufacturing of fiberglass molds is to produce a blemish-free, durable, high gloss surface. It is to the user's advantage to exercise strict quality control and application procedures when using tooling gel coats. Proper application is very important,

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since many of the defects that result from poor application do not appear until the part has been removed from the mold. Many gel coat defects result from conditions that can easily be corrected. A few of these are listed below:

1. Do not use varnish as a sealer or finish coating when preparing a plug, as the styrene in the gel coat will soften the varnish even when well waxed and coated with a parting film.
2. Proper spray technique is very important to eliminate porosity in the gel coat film. Internal air atomization spray equipment, airless or catalyst injection spray equipment, can result in porosity in the gel coat film if improperly applied. Tooling gel coats will not be as tolerant of inaccuracies in a catalyst injection system as are production gel coats.
3. Tooling gel coats must be mixed; however, do not over-mix. Over-mixing breaks down viscosity, increasing tendencies to sag, and causes styrene loss, which could contribute to porosity. Tooling gel coats just need mixing when opened (and daily thereafter). The gel coat should be mixed to the sides of the container with the least amount of turbulence possible. Air bubbling should not be used. It is not effective and only serves as a potential for water or oil contamination.
4. Always keep the container covered (except when transferring material). An open container is easily contaminated and allows for more styrene evaporation.
5. Each coat must cure as a total film rather than several thin films which might cure independently of each other. It is essential to cover-over-spray and thin passes as soon as possible (within 5 minutes). Thin, independently curing films can create a textured effect when the surface is sanded and buffed.
6. Never reduce tooling gel coat with a conventional paint or lacquer thinner, or acetone.
7. Disperse catalyst thoroughly in tooling gel coat. Poor distribution causes uneven cure, print-through, and premature release from the plug before lay-up.
8. Do not over-catalyze. Excess catalyst plasticizes tooling gel coats.
9. Print-through (fiber pattern) and distortion are directly proportional to film thickness. Thicker films (not to exceed 40 mils wet total) resist print-through and distortion better than thinner films.
10. Atomize the tooling gel coat thoroughly when spraying. Low spray pressures will result in poor breakup and leave entrapped air in the gel coat. To check atomization for porosity, spray catalyzed tooling gel coat over glass (or mold) to a film thickness of 18 plus or minus 2 mils. Laminate, pull, sand, stain and examine for entrapped air. This procedure should be followed before a plug is sprayed with tooling gel coat, and is recommended each time tooling gel coat is sprayed. These spray-outs should be saved along with other mold records.
11. In spray application of tooling gel coat, use slow, even strokes triggering spray gun at the end of each stroke—to prevent excess buildup at overlaps.
12. Do not apply tooling gel coat over wet Polyvinyl Alcohol (PVA) parting film
13. Install oil and moisture trap on compressed air line leading to spray gun—to remove lint, rust, oil and moisture.

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14. Use the catalyzed tooling gel coat within its working life—with a proper allowance of time for cleanup of equipment.
15. Tooling gel coats may leave a certain amount of “color” when sanded and/or buffed. This is a function of the pigment used and is not an indication of cure.
16. Do not add anything, other than the appropriate methyl ethyl ketone peroxide, to these products.

Storage

Uncatalyzed, these gel coats have a usage life of 90 days from date of manufacture when stored at 73F 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.

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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.

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