



POLYCOR® POLYESTER TOOLING GEL COAT 945YA058

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DESCRIPTION

CCP Composites Korea Tooling Gel Coats are specifically formulated with selected resins that exhibit high Heat Distortion Temperature to withstand the repeated molding of FRP laminates. They provide a high gloss and hard durable surface. These tooling gel coats are ready to be sprayed after the addition of the proper amount of the appropriate methyl ethyl ketone peroxide. They are formulated to be low in hide so that imperfections can be easily spotted. Read application instructions carefully, because even though manufacturing precautions are used to make tooling gel coat, a misapplication of these products can produce unacceptable results.

TYPICAL LIQUID PROPERTIES

<u>Test</u>	<u>Value</u>
Color:	Orange
Viscosity at 25°C: (Brookfield RVF, Spindle No.4 @ 4 rpm)	15,000 – 20,000 cps
Thixotropic Index at 25°C: (Brookfield RVF, Spindle No.4, Speeds 2 and 20 rpm)	6.0 – 8.0
Flash Point:	31°C
Volatile Organic Compound:	46.2 – 48.2.0%
Reactivity at 25°C, using 1.8% of MEKP-925	
Gel Time:	18 – 23 minutes
Lay-up Time:	60 – 90 minutes
Barcol Hardness: (Model 943, 50 gr mass, after 75 minutes)	35 – 45
Hide Complete (wet):	23 – 28 mils

Heat Distortion Temperature of Tooling Gel coat is 50°C with room temperature cure and 95°C - 100°C if post cured 3 hours at 65°C.

APPLICATION RECOMMENDATIONS:

Tooling gel coats are applied to the plug to be duplicated. Care must be taken when preparing these plugs with wax to permit positive release.

Best results are obtained by applying 2 gel coat layers of 18 (±2) mils wet each and allowing the material to gel and cure between these two applications. Allow the gel coat to attain lay-up time between each coat. Apply each gel coat layer with a minimum of 2 passes (three passes are preferred). For best results, ensure that the tooling gel coat is allowed to “breathe” for 2 minutes between each pass. Do not allow over-spray and thin passes to go over 5 minutes without covering with a fresh pass. Do not apply more than 20 mils per coat, as this can result in 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 coat.

CCP Composites Korea Tooling Gel Coats are formulated for Spray Application. Brushing is not recommended.

Conventional Air Atomized

Best results are obtained using pressure pot spray equipment and batch mixing.



The following equipment is recommended:

Binks Equipment

Fluid Nozzle: 66 or 67
 Air Nozzle: 63 PB or 67 PB
 More than 13 C.F.M. required.

DeVilbiss Equipment

Gun: P-JGA-502
 Nozzle Combination: 704-E
 More than 17 C.F.M. required.
 Do not spray more than 2.5 pounds per minute of Tooling Gel Coat. A minimum of 60 psi atomizing pressure (measured at the gun with fan full open) should be used to properly atomize the material.

Airless Equipment

Airless Equipments were developed as a customer accommodation and the customer must assure suitability for themselves of the product and process. CCP Composites Korea does not typically recommend that pumps or catalyst injection systems be used for spraying Tooling Gel Coats. Even with the equipment properly calibrated, potential problems can occur due to poorly atomized catalyst, poor tip alignment, contamination, poor application procedures, etc... which will quickly negate all benefits of calibration. The equipment & application procedures must be monitored on a routine basis to ensure proper application and gel coat cure. Ask about and adhere to all equipment manufacturers recommendations.

Production requirements might dictate the “calculated risk” of airless catalyst injection equipment for the

spraying of production units and therefore the risk of a ruined or sub-par unit. This risk is obviously much greater when building costly plugs and molds.

In order to reduce the risk of a ruined mold, specific (but not inclusive) directions are:

1. Calibrate daily or for each job:
 - a. Gel coat delivery: 1.5 to 2.5 pounds min,
 - b. Catalyst content: 1.2% – 3.0% (1.8% at 25°C, ideally),
 - c. Gel coat tip size: 0.021 inch.
2. Ensure complete mixing of gel coat/catalyst and atomization. If air assistance is used, keep it as low as possible. Excess air-assistance can result in trapping air in the film, and sag tendency.
3. Do not let raw catalyst drops fall on the plug surface or on the sprayed gel coat layer.
4. Spray gun distance should be no less than two feet and no more than three feet.

Equipment and application should be constantly monitored to maintain effective calibration, excellent gel coat and catalyst mixing, etc... This would require an assistant to ensure effective monitoring. When applied with care, this Tooling Gel Coats will provide a durable and long-lasting mold. However, when compared to a hot pot, where catalyst is pre-mixed into the gel coat, airless catalyst injection equipment and methods of application can cause problems such as:



- a) Spotty cure sticking
Due to improper ratio catalyst / gel coat, poor atomizing from incorrect calibration, malfunctioning injector slave pumps, etc...
- b) Porosity
Due to excessive air assistance, flow rates greater than 2.5 pounds per minute, more than 6 to 8 mils wet in one pass, etc...
- c) Low initial gloss
Incorrect catalyst calibration, raw catalyst sprayed on plug, undercured gel coat film, etc...
- d) Gloss dulling
Due to under or over catalyzation (hence under-cured gel coat)
- e) Uneven film thickness
Operator error, excessive surges during spray out, etc...
- f) Sag tendency
Excessive air assistance, excessive thickness gel coat layer, spraying too close to the mold, etc...

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

For best results, it is recommended that the temperature be above 25°C.

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 (such as OPTIMOLD® or OptiPLUS™), follow lay-up time recommendations for these specific systems.

PRECAUTIONS:

The primary reason for using tooling gel coats to manufacture fiberglass molds is to produce a high quality, durable and glossy surface. Most of the frequent defects result from poor applications. You may avoid them following the suggestions below:

1. Do not use varnish as a sealer or finish coat when preparing a plug (styrene in the gel coat will soften the varnish).
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 to

CURE:

It is recommended to recheck the gel time in the customer's plant because age, temperature, humidity and catalyst will produce varied gel times.

Alternative catalvsts may be used including:

Butanox LA, Andonox LCR-S, Peroximon K12, Luperox DHD, Butanox M50, etc...



- tolerant of inaccuracies in a catalyst injection system as are production gel coat
3. Tooling gel coats appear thick in the container. After mixing the gel coat, it becomes sprayable. Do not over-mix, however. Over-mixing breaks down viscosity, increasing tendencies to sag and causes styrene loss, which might create porosities. Tooling gel coat needs mixing when opened (and daily thereafter). The gel coat should be mixing to the sides and bottom 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, of course, 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 plug before lay-up.
 8. Print-through (fiber pattern) and distortion are directly proportional to film thickness. Thicker films resist print-through and distortion better than thinner films.
 9. In spray application of tooling gel coats, use slow, even strokes, triggering the spray gun at the end of each stroke to prevent excess buildup at overlaps.
 10. Do not apply tooling gel coat over wet Polyvinyl Alcohol (PVA) parting film.
 11. Install an oil and moisture trap on the compressed air line leading to the spray gun to remove lint, rust, oil and moisture.
 12. Use the catalyzed tooling gel coat within its working life, with a proper allowance of time for cleanup of equipment.
 13. Tooling gel coats may leave a certain amount of “coloring” when sanded and/or buffed. This is a function of the pigment used and is not an indication of poor cure.
 14. Do not add anything, other than the appropriate methyl ethyl ketone peroxide, to these products.

STORAGE:

Uncatalyzed tooling gel coats have a usage life of 90 days from date of manufacture when stored at 23°C or below in a closed, factory-sealed opaque container and out of direct sunlight. The usage life is cut in half for every 15°C over 23°C.



POLYESTER SAFETY INFORMATION

All sales of products manufactured by CCP Composites Korea and described herein are made solely on condition that our customers comply with applicable health and safety laws, regulations and orders relating to the safe 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 polyester 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 personal protective equipment 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 breathe or ingest vapour, spray mists and dusts caused by applying, sanding, grinding and sawing polyester products. Wear an appropriate OSHA approved, properly fitted respirator during application and use of these products until vapours, mists and dusts are exhausted, unless air monitoring demonstrates vapours, mists and dusts are below applicable exposure limits. Follow respirator manufacturer's directions for respirator use.

The International Agency for Research on Cancer (IARC) has reclassified styrene as Group 2B "possibly carcinogenic to humans". This new classification is 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 has 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 Transport as a flammable liquid. Flammable polyester products should be kept away from heat, sparks and flame. Lighting and other electrical systems in the workplace should be vapour-proof and protected from breakage.

Vapours from styrene may cause flash fire. Styrene vapours are heavier than air and may concentrate in the lower levels of moulds and the work area. General clean air dilution or local exhaust ventilation should be provided in volume and pattern to keep vapours well below the lower explosion limit and all air contaminants (vapour, mists, dusts) below the current permissible exposure limits in the mixing, application, curing and repair areas.

Some polyester products may contain additional hazardous ingredients. To determine the hazardous ingredients present, their applicable exposure limits

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The information given herein must be read in conjunction with the relevant health and safety data. Starting point formulation and suggestions for use are given for guidance only and made without warranty. This document should not be constructed as permission or inducement to practise any invention by patent without the authority of the owner

and other safety information, read the Material Safety Data Sheet for each product (identified by product code) before using.

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 vapours or spray mist, remove to fresh air. If swallowed, get medical attention.

Polyester 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 polyester 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.

DISCLAIMER AND LIMITATION OF LIABILITY

The products sold hereunder shall meet Seller's applicable specifications at the time of shipment. Seller's specifications may be subject to change at any time without notice to Buyer. Buyer must give Seller notice in writing of any alleged defect covered by this warranty (together with all identifying details, including the product code(s), description and date of purchase) within thirty (30) days of the date of shipment of the product or prior to the expiration of the shipment's quality life, whichever occurs first. The warranty described herein shall be in lieu of any other warranty, express or implied, including but not limited to, any implied warranty or merchantability or fitness for a particular purpose. There are no warranties that extend beyond the description on the face hereof.

The Buyer's sole and exclusive remedy against Seller shall be for the replacement of the product or refund of the purchase price in the event that a defective condition of the product should be found to exist by Seller. No other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available to the Buyer.

The sole purpose of this exclusive remedy shall be to provide Buyer with replacement of the product or refund of the purchase price of the product if any defect in material or workmanship is found to exist. This exclusive remedy shall not be deemed to have failed its essential purpose so long as Seller is willing and able to replace the defective products or refund the purchase price.

Final determination of the suitability of the material for the use contemplated, the manner of use and whether the suggested use infringes any patents is the sole responsibility of the Buyer.