

Product Data



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B-9050 ALUMINIZED VINYLESTER HYBRID TOOLING GEL COAT

HK Research Corporation's Tooling Gel Coats are designed to provide the hard, durable, high-gloss surface required in a superior grade polyester tool. The toughness and chemical resistance of these tooling gel coats will develop within 24-48 hours after lamination and removal from the master or plug. This rapid development of physical properties allows the mold builder to develop the high-gloss, mirror-like finish required in polyester molds.

B-9050 Aluminized Vinylester Hybrid Tooling Gel Coat is especially formulated to increase this toughness and chemical resistance so as to produce a longer lasting mold surface that resists hazing and crazing. B-9050, when used in conjunction with HK Research's R-0560 Aluminized Isophthalic Tooling Resin, produces an FRP Tool with outstanding heat transfer properties which combined with the toughness and durability of the vinylester hybrid systems leads to outstanding mold life.

TYPICAL PROPERTIES OF UNCATALYZED GEL COAT

Weight Per Gallon, 77°F	9.4 lbs.
Specific Gravity, 77°F	1.13
Viscosity, Brookfield, 77°F	
6 rpm	12,000 cps
60 rpm	2,200 cps
Thixotropic Index	5.5
Shelf Life, 77°F	
Uncatalyzed	3 months minimum
Catalyzed, 2% MEKP*	22-28 minutes

*NORAC MEKP-925H

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APPLICATION

B-9050 is recommended for use in tooling applications along with HK Research's R-0560 Aluminized Isophthalic Tooling Resin. These products, when used as a system, in the fabrication of well designed FRP molds will give a mold with the hard, durable, high-gloss surface required of a superior grade polyester tool along with outstanding heat transfer properties that should lead to enhanced mold life and durability.

The B-9050 Aluminized Vinylester Hybrid Tooling Gel Coat should be properly catalyzed with 2.0% Methyl Ethyl Ketone Peroxide (NORAC MEKP-925H) and then sprayed onto a correctly prepared pattern or plug as outlined in HK Research's Technical Bulletin HKR055. A total of 20-25 mils of gel coat should be applied in 4-5 passes with a steady movement of the spray gun held 18-24 inches from the mold surface. This gel coat should be allowed to cure approximately 60 minutes in an area with good air movement to facilitate cure prior to proceeding with lamination.

We recommend the following lamination procedure in order to obtain the best heat transfer of this mold. The initial skin coat is a very critical part of any FRP mold. R-0560 Aluminized Isophthalic Tooling Resin should be catalyzed according to the instructions given in the R-0560 Technical Bulletin and then carefully applied by spray gun, brush or roller along with chopped strand glass directly behind the gel coat. Because the aluminum makes this resin and the resulting laminate opaque, extra care must be taken to insure that the glass reinforcement is thoroughly wet out with resin and all entrapped air is worked out of the laminate with a roller.

Once this skin coat is complete the remainder of the mold can be completed in a normal manner. In order to obtain maximum heat transfer we suggest that at least the first 3 or 4 layers of fiberglass mat laminate be made with the R-0560 resin. Any additional FRP layers can be constructed, if you so desire, with a good quality isophthalic tooling resin such as HK Research's R-0528 or R-0976 along with sufficient reinforcement and bracing to produce a good solid mold.

The combination of aluminized gel coat and aluminized resin in the layers of the laminate serves to aid heat transfer from the part to the mold. This should facilitate faster and easier demolding of parts as well as enhance the service life of the mold.

Normal break-in procedures as outlined in HK Research's Tooling Guide are still required with this type of mold. Most good mold release systems should work well but we strongly recommend a polymeric mold release type. We have found that these polymeric mold releases offer excellent release properties and lead to a long mold service life.

HK Research Tooling Gel Coats are pre-promoted and thixotropic as supplied. These gel coats should be applied only on properly prepared surfaces. All experienced mold makers understand that care in the preparation of the plug or pattern is essential to producing a good mold. We suggest that the gel coats be applied in multiple passes of the spray gun in order to slowly build up the desired thickness. It is recommended that only 3-5 mils be applied with the initial passes of the spray gun. The "several passes" technique will keep air entrapment at a minimum and result in a "pin hole and porosity free" film. A film thickness of 20-25 mils should be applied in order to obtain maximum mold life. HK Research Tooling Gel Coats are formulated to provide a rapid gel and cure time at a nominal 2% MEKP. Vinylester resins do require special catalyst systems to avoid gassing and pinholing of the gel coat surface. Our experience has shown that a "low water/low hydrogen peroxide catalyst" such as NORAC MEKP-925H will provide the optimum in pinholing resistance. Typical gel time of B-9050 with 2% NORAC MEKP-925H @ 77°F is 18-22 minutes.

It is essential that the mold temperature and ambient air temperature, as well as the material temperature, be within a temperature range of 65°F to 80°F for best results. Further assistance with particular problems and/or applications can be obtained from the HK Research Corporation Technical Service Laboratories at 1-800-334-5975.

It is suggested that the catalyst concentration used in the application of HK Research Tooling Gel Coats not exceed 2.5% or fall below 1.8% to retain maximum properties. The recommended range for the catalyst concentration within the applied film is 1.8% to 2.2% at 77°F.

Under normal conditions the gel coat is ready to "lay up" in 1 to 2 hours. The "time to laminate" is dependent on the room temperature, humidity and air movement, as well as the catalyst concentration and the film thickness. A wet film thickness of at least 18 to 20 mils is recommended for proper hiding, cure, and performance properties. These products should not be used when the temperature conditions, both mold and ambient, are below 65°F as the curing may be adversely affected.

MIXING

Prior to removal from the shipping container and catalyzation, it is recommended that the materials be mixed thoroughly to reincorporate any settled or stratified material. It is further recommended that the material in the shipping container be mixed at least once a week during its use period. This mixing procedure would assure the most uniform properties during application of the gel coat. Mechanical mixing is recommended and should be sufficient to "turn" the material 10 times. Most common gel coat mixing equipment will accomplish an adequate blend in less than 1/2 hour.

DO NOT MIX MATERIAL CONTINUOUSLY!!----As this may cause loss of thixotropic properties. If gel coat is inadvertently over mixed, hold material for 4 hours without agitation before application.

SAFETY CONSIDERATIONS

HK Research Tooling Gel Coats are based on a resin system, which contains styrene monomer, which is a flammable liquid. Keep away from sparks, heat and open flame (including pilot lights). Electrical equipment should be vapor-proof and protected from breakage.

Styrene vapors are heavier than air and will tend to concentrate in the low areas of molds and in pockets immediately above the floor area. To keep vapors within a safe limit in all areas, adequate ventilation or suction fans should be used that will remove these styrene monomer vapors.

All equipment must be grounded - including spray guns and molds.

Both the gel coat and the catalyst may cause burns to eyes and skin. Do not get in the eyes! Avoid breathing vapors! Gel coat applicators should wear a NIOSH approved respirator effective for vapors, spray mist and dust. In case of accidental contact, remove contaminated clothing and wash affected skin areas with soap and copious quantities of water. Contact a physician if persistent skin irritation occurs. For eyes, immediately flush with plenty of water for at least 15 minutes; call a physician immediately. Wash contaminated clothing before using.