

# Product Data



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## **B-3030/B-3040 BLACK VINYLESTER HYBRID TOOLING GEL COAT SYSTEM**

(Also available in Red and Green)

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.

The B-3030/B-3040 Black Vinylester Hybrid Tooling Gel Coat System is especially formulated to increase this toughness and chemical resistance so as to produce a longer lasting mold surface that resists hazing and crazing. While using the B-3030 alone will provide a very suitable tool, the combination of B-3030 backed with B-3040 Reinforced Gel Coat provides a tool with unsurpassed surface characteristics while further resisting crazing and cracking under severe usage.

Both B-3030 and B-3040 are formulated for spray application with standard cup or pressure pot spray equipment. The color is that of a typical black tooling gel coat with excellent hiding properties. The pigments used to formulate the B-3030/B-3040 Black Tooling Gel Coat System are completely lead-free and also free of any other heavy metal pigments that could be considered environmentally objectionable. Some customers prefer contrasting surface / back-up colors for ease of application and future mold repair.

The B-3030/B-3040 Black Vinylester Hybrid Tooling Gel Coat System can be backed with Traditional Tooling System Isophthalic Resins such as HK Research's R-0528 and Reichhold 33-540 Low Profile Tooling System. Epoxy laminating or casting systems can be used to provide even a higher quality tool. For a superior tool, HK Research recommends use of R-0537 skin coat resin.

The B-3030/B-3040 system provides the toolmaker with a Gel Coat System that produces the most heat resistant (HDT of over 200°C.) commercially available tooling Gel Coat in the industry. The formulations were developed in a joint-research effort with Reichhold Research Center personnel and the HK Research technical team. The result is a tooling system of unsurpassed quality suitable for rigorous environments such as heated RTM molds. The system allows the use of traditional laminating materials or epoxy systems (even epoxy/aluminum cast systems). The B-3030 Surface is almost glass-like and the B-3040 Reinforcing Gel Coat keeps it that way.

## TYPICAL PROPERTIES OF UNCATALYZED GEL COAT

	<u>B-3030</u> B-4030, B-5030)	<u>B-3040</u> (B-4040, B-5040)
Weight Per Gallon, 77°F:	9.0 lbs.	9.5 lbs.
Specific Gravity, 77°F:	1.08	1.14
Viscosity, Brookfield, 77°F, 6 rpm:	9,000-11,000 cps	8,000-10,000 cps
60 rpm:	1,500-2000 cps	1,500-2000 cps
Thixotropic Index:	4.5-6.0	5.0-6.1
Shelf Life, 77°F: Uncatalyzed:	2 months minimum	2 months minimum

## TYPICAL PROPERTIES OF CATALYZED GEL COAT

Gel Time, 2% TBPB*	40-50 minutes	40-50 minutes
Hardness, Barcol:	55-60	55-60
HDT °C./°F.:	200/390	200/390

\* NOROX TBPB or equivalent

## OTHER COLORS

B-4030/B-4040 Red Vinylester Hybrid Tooling System  
B-5030/B-5040 Green Vinylester Hybrid Tooling System

Properties are the same as the B-3030/B-3040 System.

## APPLICATION

HK Research Tooling Gel Coats are pre-promoted and thixotropic as supplied. These gel coats should be applied only on properly prepared surfaces. HK Research recommends the use of carnauba paste wax for use with B-3030. Paste wax should be utilized on the plug or pattern and as a release aid for production parts. Polymer release aids are **not** recommended by HK Research for use with B-3030/B3040 tooling systems. 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 of B-3030 should be applied in order to obtain maximum mold life. After the B-3030 has cured to an essentially "tack free" state (60 to 90 min.) application of the B-3040 should be applied to a film thickness of 15-20 mils. After B-3040 has cured to an essentially "tack free" state (60 to 90 min.) the skin coat should be applied. Then proceed to normal laminate schedule. HK Research Tooling Gel Coats are formulated to provide a rapid gel and cure time at a nominal 2% tertiary-Butyl Peroxybenzoate catalyst (NOROX TBPB or equivalent).

### **Do not use standard MEKP Catalyst with this system.**

It is suggested that the catalyst concentration used in the application of HK Research Tooling Gel Coats not exceed 2.5% or fall below 1.25% to retain maximum properties. The recommended range for the catalyst concentration within the applied film is 1.5% to 2.0% at 77°F.

Minimal air movement over the wet tooling gel is necessary to prevent monomer vapors from laying in mold recesses. Excessive air movement will result in "air drying" of the tooling and lead to poor interlaminar adhesion.

Under normal conditions the gel coat is ready to "lay up" in 60 to 90 minutes. 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 20-25 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.

**Important:** Because of high crosslink density, backup (B-3040 or equivalent) should be applied immediately after the surface coat is cured "tack free" (60 to 90 min.). Skin coat should be applied immediately after back-up is cured tack free (60 to 90 min.). Excessive time intervals between coats and lamination could result in poor interlaminar adhesion.

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.

## **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 that 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.