

## PRODUCT DATA SHEET: PPC™—1121

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### PRODUCT DESCRIPTION

PPC™ -1121 is Kwik Bond's polyester-based polymer overlay and patching product designed for high strength, rapid setting applications, and ability to pave thin or thick cross sections. PPC -1121 conforms to the latest specifications for PPC. This system achieves over 4000 psi in compressive strength within 24 hours as well as over 1600 psi in flexural strength. Traffic can be safely returned within 1.5-2 hours at temperatures down to 40 F. In direct adhesion testing to PCC concrete used for bridge deck applications, the failure mode is cohesion within the PCC concrete.

PPC™ -1121 has the following performance advantages:

- PPC™ -1121 conforms to the latest draft specifications for polyester polymer concrete
- PPC™ -1121 has high mechanical strength properties in both compression and flex.
- PPC™ -Binder Resin has a long history of overlay performance ( In use since 1981)
- PPC™ -1121, when mixed and applied properly, can return traffic safely within 1.5- 2 hours at temperatures down to 40 F.

For today's congested bridges and highways, PPC™ 1121 is the highest performing, most cost effective material for overlaying, patching, repairing, and rehabilitating Portland Cement Concrete, Latex Modified Concrete, or Silica Fume Modified Concrete.

**SPECIAL FEATURES**

- Low viscosity for easy mixing
- KBP 204 “healer/sealer” primer re-bonds cracks in PCC and promotes adhesion to the PPC overlay material
- Rapid curing and strength development
- Excellent finishing and sealing characteristics
- Superior abrasion resistance to chains and studded snow tires

PHYSICAL PROPERTIES – PPC™ Binder Resin	
Specific Gravity- ASTM D-1475	1.05-1.10
Viscosity-ASTM D2196 75-200 cps	.075-.2 Pa-s
Flash Point (Seta flash)	90 F
Adhesion (Cal-Trans Test Method 551)-500 psi	>3.5 M Pas
Tensile Strength (ASTM D-638, 5.5-7.5mm, cast and conditioned according to latest ver- sion of specifications)-2500 psi min.	> 17.5 M Pas
Tensile Elongation (ASTM D-638, 5.5mm- 7.5mm, cast and conditioned according to the latest version of specifications)	35%, min.
Static Volatile Emission	60 grams max
Styrene content-ASTM D-2369	40-50%
Cured Density (ASTM C-138)	134-136 lbs/cu. ft.

TYPICAL AGGREGATE GRADATION*	
Screen Size	% Passing
9.5mm	100
4.75mm	70
2.36mm	50
1.18mm	44
600um	30
300um	5-20
150um	1
75um	T

\*Combined average moisture absorption of the aggregates is less than 1%.

**APPLICATION**

**Surface Preparation:** Shot-blasting, sandblasting, scarifying, chipping, or other cleaning processes are required to provide proper surface preparation for a long-lasting polymer overlay and/or patching system. The final surface should be clean, free of oils, dirt, curing compounds, and other materials that may affect the adhesion of the polymer system. Unsound concrete areas should be located by using a chain-drag or hammer. The unsound areas must be removed until a sound concrete base is established.

**Patch Application:** After the bridge deck area to be overlaid is cleaned and prepared properly, follow the next steps for patching unsound concrete:

1. Saw cut (dry blade) a minimum ¾” depth shoulder around the edge of the prepared area
2. Chip out and remove delaminated area
3. Blow off (sweep away) dust from saw cutting operations
4. Prime the spall with KBP 204 high molecular weight methacrylate primer
5. Mix PPC™ 1121
6. Fill the prepared area to rough grade; screed to final grade
7. Texture finished surface with No.8 x 12, or 10 x 30 sandblast sand, broom or tine finish

**Primer:** Mix 1/2 gallon KBP 204 with 1 fluid ounce of 6% Cobalt Drier(Dark Blue Material). Stir for 10 seconds. Add 1 fluid ounce of Cumene Hydro Peroxide and stir for another 30 seconds. Using a paint brush or similar applicator, wet-out the entire surface of the area to be repaired. KBP 204 is very fluid and will wet the surface quickly. The excess will rapidly build-up at the lowest points

in the prepared area. Excess primer is undesirable. Apply primer carefully to have as little excess build-up as possible. Some build-up is unavoidable. Note: This mix design represents a starting point for anticipated temperatures of 70 F during daytime conditions. Modifications may be required for working under different temperature conditions or during night time application. For very warm temperatures, night time application should be considered. Reducing CHP levels to 1 fl oz per gallon for elevated temperature applications should be evaluated. During cold night time applications, both Promoter and CHP levels may be increased. Adding Z Cure accelerator may be required.

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### PPC™ 1121 MIX DESIGN-STARTING POINT

To a clean 9 cubic foot mortar mixer, add 16.36 kg of PPC™ Binder Resin 32-043-15. Add 7-12 fluid ounces (216-370) grams of DDM 9 (MEKP) catalyst. **Note: For faster strength gain requirements, add Z Cure at 6-30 ml's to PPC Binder Resin-(32-043-15).** While mortar mixer is turning with PPC Binder Resin (32-043-15) and catalyst, add 45.45 kg (100 lbs) of B-39 Rock(K-39 alt.) and 90.9 kg (200 lbs) of B-11 Sand. Mix for approximately 2 minutes depending on temperature. Dump catalyzed patching compound into a wheelbarrow or similar transfer device. Repeat the process described above. Read the notes section regarding primer mix design and application. Mix design adjustments are required for changes in temperature or nighttime application. Higher or lower catalyst additions may be required for night time conditions. Temperature and application timing have a definite effect upon set time of the polyester polymer concrete and the ultimate return to service.

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### FINISHING

Fill spalls with the catalyzed patching material. Compact spalls, strike-off to match finished surface, apply texture sand. Typical work time is 30 minutes. UV light accelerates the set time. PPC™1121 is best used at temperatures between 40-90 F. Adjustments in catalyst types and concentrations may be necessary when working outside the optimum temperature range. Trial batches are recommended to determine work times and set times based on anticipated application temperatures, conditions, and lane closure timing.

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### OVERLAY APPLICATION

**Primer:** Follow directions listed above for spall repair. Surface preparation also remains the same.

**Mix Design:** Resin-catalyst content to aggregate ratio is about 12% by weight. B-11 sand to B-39(K-39 alt) ratio is 67:33 to 60:40. Note: 60:40 ratio appears to mix and work a little easier. Resin/Catalyst ratio will vary with temperature, type of equipment used, traffic windows, and other factors. For night work applications with limited traffic windows, PPC Binder Resin (32-043-15) resin with Z Cure is recommended with 1.5-2.25% DDM 9 initiator. Using accelerated resin almost always requires the use of an automated mixer with proportioned catalyst injection (above line pressure) into the resin stream. The combined resin/catalyst should be further mixed through a static mixer head.

Completed PPC™ 1121 overlays have been returned to traffic service within 1.5-3 hours. To return traffic Swiss Hammer readings should be 24 and above.

**Placement:** PPC 1121™ overlay materials may be placed using a vibratory screed or a slip form paving machine. A mechanical tining device should be arranged on a slip form paving machine to achieve a uniform tined surface to provide a superior skid resistance. Longitudinal tines or transverse tines are acceptable. Longitudinal tining not only provides for superior skid resistance but also provides

a quieter surface. Engineers have difference of opinions of the merits of longitudinal tining or transverse tining on bridge decks.

PPC 1121™ should be mixed and vibrated to produce a polymer concrete material with a slight excess bleed resin coming to the surface. The excess bleed resin indicates that air has been vibrated out of the mix. Excessive bleed resin should be avoided but can be managed. Excessive bleed resin can be absorbed by topical aggregates. However, finished grades may be compromised. Resin content is adjustable to reduce the amount of bleed resin that comes to the surface of the finished polyester polymer concrete surface.

PPC 1121™ may be placed at thicknesses of 1/2"- 12" thick in a single pass to account for grade adjustments necessary on rehabilitation projects. The mix design may be adjusted to handle a 15% super elevation and still remain place able. Wood forms, steel pipe, and slip form devices have been used to set final grade.

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## STANDARD PACKAGING

- PPC Binder Resin™ (32-043-15)-45 lb pail, 496 lb drum, 40,000 lb tank truck
- B-11 Sand-50 bags or 2 ton super sacks
- B-39 Rock-50 lb bags or 2 ton super sacks
- K-39 Rock- 50 lb bags or 1.5 ton super sacks
- DDM-9 (MEKP)- 1 gallon bottles
- KBP 204 monomer-4 gallon pails or 50 gallon drums
- 6% Cobalt Drier-pre-packaged bottles, 1-gallon can, 4 gallon pail
- Cumene Hydro Peroxide- 1-gallon bottles
- Z Cure-pre-packaged bottles, 1 gallon bottle can or 5 gallon pail

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## SAFETY

PPC™ 1121 system polymer materials have been used safely for over 20 years. However, there are certain safety issues that need to be readily understood. PPC™ -Binder Resin is **FLAMMABLE!** **NO SMOKING** is allowed! Fire extinguishers must be available as well as plans for emergency situations. Emergency situations are unlikely, but preparation is always **SMART!**

The KBP 204 primer is a three-component, high molecular weight methacrylate system. The 6% Cobalt Drier and the Cumene Hydro Peroxide components are **INCOMPATIBLE** materials. They must **NEVER** be mixed together by themselves! **A FLASH FIRE WILL OCCUR!** To safely mix the KBP 204 primer, follow the mixing instructions carefully! Follow the mixing instructions outlined in this product data sheet and safety will be maintained. For emergency situations, always have available clean water for accidental contact in the eyes, fire extinguishers, and emergency center addresses, phone numbers.

Wear protective clothing, eye protection, and chemical resistant gloves. Organic vapor respirators are not normally required. For individuals highly sensitive to chemical vapors, organic vapor respirators are suggested.

## STORAGE

Aggregates, PPC™ Binder Resin, and KBP 204 should be stored in a cool, dry location and in their original containers. The shelf life for these materials stored at temperatures 80 F and below is 12 months. PPC™ Binder Resin and KBP 204 contain reactive polymers. At elevated temperature, storage shelf life is reduced. Store all bagged aggregates in a clean, dry location away from moisture. Absolutely, protect from moisture.

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