

PRODUCT DATA SHEET: PPC 1121 Polyester Polymer Concrete

PPC 1121 Polyester Polymer Concrete is a pre-mixed polymer concrete made of polyester binder resin and graded aggregates with a High Molecular Weight Methacrylate (HMWM) primer system that develops true composite action at the bond line of the substrate. PPC 1121 is designed for bridge deck overlay, patching and joint header applications for the rehabilitation and preservation of existing and new bridge structures that require long term performance, impermeability to chlorides and moisture, abrasion resistance, ease of construction and rapid traffic return after placement.

SPECIAL FEATURES

- 2-hour traffic return at all placement temperatures
 - 40 to 100°F for overlays
 - -10 to 110°F for patches and headers
- Variable thickness placement ¾" to >12" in a single lift
- 0 coulombs permeability to moisture and chloride ions
- HMWM primer saturates and strengthens the substrate transition zone for true adhesive composite action at the bond line
- Over 35 years of proven performance

PPC 1121 Composite Properties		
Compressive Strength	ASTM C39	6,000 psi
Tensile Strength	ASTM C1583	800 psi
Flexural Strength	ASTM C78	2,000 psi
Modulus of Elasticity	ASTM C469	1,500 ksi
Coefficient of Thermal Expansion	ASTM T336	<10 x 10 ⁻⁶ in/in/°F
Abrasion Resistance	CT 550	< 2g weight loss
Bond Strength	CT 551, SSD w/ HMWM	>700 psi
	CT 551, SSD w/o HMWM	>500 psi
Permeability	ASTM C1202	0 coulombs
Linear Shrinkage	ASTM C157 (4-hr initial)	< 500 µε

APPLICATION

SURFACE PREPARATION:

PPC 1121 is applied to concrete or steel substrates that are sound, strong, clean, visibly dry, and abrasively blasted.

Identify unsound concrete by chain-drag or hammer sounding. Remove unsound areas to sound concrete. Rebar exposure is not required for composite action between PPC 1121 and substrate material.

Complete removal of existing overlay materials below the existing bond line is recommended. Existing concrete overlays that are both structurally sound and also placed below the top mat of rebar may remain in place.

Abrasive blasting is required for all substrate surfaces, including new CIP concrete, new precast concrete, existing concrete, milled concrete, diamond ground concrete and all steel. Abrasively clean concrete substrate surfaces by shot blasting to remove all visible contaminants and excess cement paste, yield an open pore structure and expose some aggregate within the concrete. Sand blasting is acceptable for patches and headers as well as vertical surfaces and boundaries of overlay areas inaccessible to the shot blasting machine. Abrasively clean steel surfaces by shot or sand blasting to remove all visible contaminants and flash rust leaving a clean steel finish.

PATCHING:

Complete patches with PPC 1121 or HCSC for optimal thermal compatibility. PPC 1121 and HCSC patches may be overlaid with

PPC 1121 after 2 hours and 4,000 psi manual rebound hammer reading per ASTM C805.

Patches made with most cementitious materials must reach both 80% expected ultimate strength AND a minimum of 3-days open air cure after wet-curing prior to overlay.

UHPC closure pours must reach 14 ksi compressive strength prior to PPC 1121 overlay. It is recommended that UHPC surface is ground to remove air pockets, laitance, and weak cement paste prior to surface preparation for overlay by abrasive blasting.

Avoid placing PPC 1121 on patches with high expected shrinkage. Do not use patching materials with CTE >15x10⁻⁶ in/in/°F.

FORMING:

Suggested materials to form expansion joint gaps include rigid foam board wrapped in polyethylene sheeting or closed cell backer rod. Closed cell spray foam used for small gaps and holes must form a hard shell prior to PPC 1121 installation. Do not use open cell spray foam.

Overlays placed with a vibratory screed can be formed with wood strips or steel set to finished grade.

Line bottom formwork for full depth PPC 1121 elements such as patches, joints and closure pours with polyethylene sheeting.

TOOLS & EQUIPMENT:

KBP ProPrime is mixed in buckets and placed with rollers, brooms and brushes.

PPC 1121 is mixed in batches using ≥ 9 CF paddle or drum mixers, or continuously using volumetric mixing trucks specifically designed for production of PPC 1121 material. Mix in single, double or partial batches as needed. A single batch is 2.5 CF.

PPC 1121 is placed to grade using a vibratory screed or automated slip form paver specifically designed for PPC 1121. Do not use a roller screed. Finish with standard concrete finishing tools such as hand floats, bull floats and fresno trowels.

HMWM PRIMER INSTALLATION:

KBP ProPrime is a pre-promoted version of KBP 204 with the cobalt



promotor pre-mixed into the HMWM resin prior to shipment. For applications that require delivery of un-promoted KBP 204 primer instead of KBP ProPrime, follow KBP 204 mixing directions.

KBP ProPrime Components:

- ProPrime HMWM Resin
- Cumene Hydro Peroxide (CHP) Initiator (3 oz per gal of ProPrime)
- ZCure Accelerator (varies based on temperature 0 to 3oz/gal)

Ensure substrate temperature is within the specified range using an infrared temperature gun. Premix the entire container of KBP 204 ProPrime to ensure that contents are well mixed before portioning out material to be used. Combine up to 4 gal KBP ProPrime HMWM resin, CHP and ZCure in a clean, dry bucket and mix for 30 seconds with a drill mixer. Follow mix ratios given by KBP technical service representative for exact mix proportions.

Within 5 minutes of mixing, empty contents onto the substrate surface. Evenly spread primer to refusal using brooms or rollers and brushes. Reapply to dry areas and redistribute excess puddling as necessary leaving a deeply saturated substrate. Application rates range from 70-120 sf/gal depending on porosity and surface texture of the deck. Place PPC 1121 within 15-120 minutes after priming.

PPC 1121 MIXING:

PPC 1121 Components:

- Polyester Binder Resin (unsaturated isophthalic polyester-styrene)
- Graded silica-quartz aggregates
- Methyl Ethyl Ketone Peroxide (MEKP) Initiator
- ZCure Accelerator

To mix a single 2.5 CF batch of PPC 1121, combine 4 gallons of Polyester Binder Resin, (7 to 15 oz) MEKP and (0 to 4 oz) ZCure in a clean, dry bucket and mix for 30 seconds with a drill mixer. Exact levels to be used are dependent on placement conditions, temperature, application, and dimensions. Follow KBP technical support guidance for specific mix design.

While clean mortar mixer is turning, add catalyzed Polyester Binder Resin, 2 each 50 lb bags of KBP number 39 Stone (B39, S39, KBEC39) and 4 each 50 lb bags of KBP Blended PPC Sand (B11, S11, KBEC11). Alternately, 6 each 50 lb bags of KBP blended single bag aggregates (Blend 84, KBEC 84) may be used. These are the premixed equivalent of sand and stone at the 2:1 ratio.

Mix for 1-2 minutes and until all aggregate appears wetted.

Dump catalyzed material into a wheelbarrow, buggy, or other transfer device. Immediately recharge mixer with proper volume of catalyzed Polyester Binder Resin and continue mixing ONLY if crew is ready for another mix. If mixing operation is expected to stop for ~10+ minutes, clean mixer with acetone and allow to evaporate prior to resuming.

Adjust catalyst levels as needed to account for changes in temperature, application type, environmental conditions, and proper strength gain requirements. Temperature and application timing impact working time and strength development of PPC 1121. Mix to achieve a 30 minute initial set time and rapid strength gain thereafter.

Continuous volumetric mixers specifically designed for mixing PPC 1121 may also be used for high output applications. Volumetric mixers must be properly calibrated and equipped with appropriate resin/catalyst/accelerator pumping systems as well as computer

tracking system capable of meeting specifications for output tracking and calibration.

KBP PPC Easy Patch kits include the same component materials as PPC 1121, pre-proportioned in a 0.43 cubic foot kit, packaged in a 5-gallon bucket.

FINISHING

Place PPC 1121 mixture to grade using a vibratory screed, a slip form paving machine, or standard hand finishing tools for smaller areas. Strike off and fill to finished grade using concrete finishing tools as needed. Properly finished PPC 1121 should yield a well-compacted material with a slight glossy sheen without excessive bleed resin. Immediately hand broadcast top sand leaving an evenly covered finished surface free of mirroring or glossing. Texture with tine rake as required by the specification (or 1/8" teeth @ $\geq 3/4$ " spacing) after sanding and prior to initial set, or mechanical saw-cut grooving (minimum 48 hours after installation). Broadcast top sand may be cast after tining ONLY when tines are mounted directly to the slip-form paver.

PPC 1121 can be placed for overlay application at temperatures between 40-100°F. Patching, joint headers, and other work with minimal surface area may be performed at temperatures between -10-110°F. Trial batches can be used to determine working time and set time based on anticipated application temperatures, conditions, and strength gain requirements.

CLEANUP

Clean tools, screed and mixer with acetone, or other suitable solvent prior to initial set. Cured material may have to be chipped off. Mixers in continuous operation do not need to be cleaned between batches.

STANDARD PACKAGING

- Polyester Binder Resin: 4 gal pail, 55 gal drum, 40,000 lb tankers
- Mix Aggregates: 50 lb bags, 2 ton super sacks
- Top Sand: 50 lb bags
- KBP 204 ProPrime: 4 gal pails, 50 gal drums, 250 gal totes
- MEKP & CHP: 12 oz and 1 gal bottles
- Z Cure: 12 oz and 1 gal bottles & 5 gal pails

SAFETY & STORAGE

Follow all OSHA, and other guidelines as well as all applicable fire codes. Refer to SDS for storage, handling, and use. Gloves, eye protection, and other protective clothing should be worn while working with PPC 1121 and KBP ProPrime. Respirator with Organic Vapor cartridges may be desired while working with PPC1121 Binder Resin. Dust protection must be worn while working with neat aggregates. If liquid components come in direct contact with skin, wash off with soap and water. If any component gets in eyes, flush immediately with eye wash. If customer requests to have Cobalt promoter supplied separately from HMWM resin, extra care must be taken to avoid contact between Cobalt promoter and peroxide catalysts as a violent exothermic reaction will occur.

Store all components in a cool, dry location out of direct sunlight and in their original containers. Always protect components from moisture. Minimum shelf life is 12 months when properly stored.

The technical data furnished is true and accurate to the best of our knowledge. However, no guarantee of accuracy is given or implied. We suggest that customers evaluate these recommendations and suggestions in conjunction with their specific application. Kwik Bond Polymers, LLC warrants its products to be free from manufacturing defects conforming to its most recent material specifications. In the event of defective materials, Kwik Bond Polymers, LLC's liability will be limited to the replacement of material or the material value only at the sole discretion of Kwik Bond Polymers, LLC. Kwik Bond Polymers, LLC assumes no responsibility for coverage, suitability of application, performance or injuries resulting from use. 2/22/2021