KWIK BOND POLYMERS

BUILDING TRUST

PRODUCT DATA SHEET

TPO AD- Thin Polymer Overlay Advanced

AN ALTERNATIVE TO CONVENTIONAL THIN POLYMER MULTI-LAYER BRIDGE DECK OVERLAY SYSTEMS

PRODUCT DESCRIPTION

TPO AD is an alternative to conventional thin polymer multi-layer bridge deck overlay systems that combines the performance of Kwik Bond's legendary preservation and safety systems to advance the functionality within the thin polymer overlay class. A High Molecular Weight Methacrylate (HMWM) first layer saturates the substrate concrete permanently repairing cracks and restores flexural continuity within the bridge deck while promoting adhesion of the composite TPO AD system. The hybrid polyester copolymer binder resin second layer further protects the bridge deck and secures a durable, high friction calcined-bauxite broadcast aggregate.

SPECIAL FEATURES

- 2-hour traffic return at all temperatures from 40 to 100° F
- Healer/sealer, polymer overlay and high friction surface treatment synthesized into one system
- Eliminates pin-holing, reduces chloride penetration, improves thermal compatibility and increases friction compared to conventional thin polymer overlay systems
- TPO AD is specified alongside conventional multi-layer polymer bridge deck overlay systems as a direct substitute

Layer 1 Resin: KBP ProPrime- HMWM	
Relative Density (ASTM D1475)	1.06
Viscosity (ASTM D2556)	<25 cps
Ultimate Tensile (ASTM D638 Type I) (for both layer 1 and layer 2)	>2,700 psi
Bond Strength (ASTM C882)	>2,500 psi
Layer 2 Resin: PPC MLS – Hybrid Polyester	
Viscosity (ASTM D2556)	1000-2000 cps
Cure Rate (ASTM D1640 Method A)	<3 hours
Gel Time (ASTM C881)	10-30 minutes
Tensile Elongation at Break (ASTM D638)	>30%
Ultimate Tensile Strength (ASTM D638)	>2,700 psi
Bond Strength (ASTM C1583)	>250 psi or 100% substrate failure
Calcined-Bauxite Broadcast Aggregate	
#4 (% passing)	100
#6 (% passing)	>95
#16 (% passing)	0-5
#30 (% passing)	0-1
Aluminum Oxide Content (ASTM C25)	>87%

SURFACE PREPARATION

TPO AD is applied to concrete substrates that are sound, strong, clean, visibly dry, and abrasively blasted.

Identify unsound concrete by chain-drag or hammer. Remove unsound areas to sound concrete. Complete removal of existing thin polymer overlay materials below the existing bond line is recommended. Existing thick overlays that are structurally sound may remain in place.

Abrasive blasting is the required method of surface preparation for all substrate surfaces, including new CIP concrete, new precast concrete, existing concrete, existing thick polymer concrete, milled concrete, diamond ground concrete and all steel.

Abrasively clean 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 affiliated patches and headers as well as vertical surfaces, edges and corners of overlay areas inaccessible to the shot blasting machine.

PATCHING:
Complete patches in substrate concrete with PPC 1121 or HCSC for optimal thermal, structural and mechanical

compatibility with the existing deck as the TPO AD substrate. PPC 1121 and HCSC patches may be overlaid with TPO AD 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 any prescribed wet-curing prior to overlay.

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

Avoid placing TPO AD on patches with high expected shrinkage. Do not use patching materials with CTE >15x10-6 in/in/°F.

TOOLS & EQUIPMENT:
For standard production of smaller applications TPO AD may be mixed in buckets and placed with rollers, brooms, brushes and notched squeegees.

For higher production applications TPO AD may be mixed and placed using automated equipment specifically designed for HMWM and Polyester-based resin systems.

Calcined-bauxite aggregate is typically applied by hand broadcasting. Automated equipment featuring mechanized aggregate broadcasters are also acceptable.

TPO AD SYSTEM DESCRIPTION:
TPO AD consists of a High Molecular Weight Methacrylate (HMWM) first layer followed by a Polyester resin second layer with calcined-bauxite broadcast aggregate.

Layer 1: KBP ProPrime HMWM
Layer 2: PPC MLS Polyester + Calcined-bauxite Aggregate

INSTALLATION

LAYER 1:
KBP ProPrime HMWM is a pre-promoted version of KBP 204 with the cobalt promotor pre-mixed into HMWM resin prior to shipment.

KBP ProPrime Components:
- Pre-promoted HMWM Resin
- Cumene Hydro Peroxide (CHP) Initiator
- ZCure Accelerator

Ensure substrate temperature is within the specified range using an infrared temperature gun. 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 KBP ProPrime HMWM resin Layer 1 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 80-120 SF/Gal depending on porosity and surface texture of the deck.

Place PPC MLS Polyester resin Layer 2 within 15-120 minutes after installing KBP ProPrime HMWM resin Layer 1.

LAYER 2:
PPC MLS and PPC HFST Polyester resins are identical resins. Binder resins used in PPC 1121 and HCSC systems are NOT interchangeable with the TPO AD system.

PPC MLS Polyester Resin Components:
- Polyester Resin
- Methyl Ethyl Ketone Peroxide (MEKP) Initiator
- ZCure Accelerator

Combine up to 4 gal Polyester Resin, MEKP Initiator and ZCure Accelerator 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 10 minutes and as soon as possible after mixing Layer 2 Polyester resin, with a properly notched or serrated squeegee apply evenly directly over Layer 1 HMWM resin at a rate of 25-32 sf/gal or 50-65 wet mils in thickness ensuring complete Layer 2 coverage over Layer 1.

AGGREGATE:
Immediately after installing Layer 2 Polyester resin, handbroadcast calcined bauxite aggregates evenly onto top surface of Layer 2 Polyester resin until refusal (approx. 11-15 lbs/SY.)

Do not drive on the installed resin layers before placing the aggregate. Once the TPO AD appears traffic-supportable and system readily retains surface aggregate to the touch, remove excess aggregate by sweeping (not prior to 2 hours from placement.)

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 TPO AD.

Automated equipment specifically designed for mixing TPO AD resins may also be used for high output applications. Automated equipment must be properly calibrated and equipped withappropriate resin/catalyst/accelerator pumping systems as well as computer tracking system capable of metering output.

Trial batches can be used to determine working time and set time based on anticipated application temperatures, conditions, and traffic control restrictions.

CLEAN UP

Clean tools and equipment 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

- KBP ProPrime HMWM: 4 gal pails, 50 gal drums, 250 gal totes
- Polyester Binder Resin: 4 gal pail, 50 gal drum, 40,000 lb tankers
- Calcined-bauxite: As typically available
- MEKP & CHP: 12 oz and 1 gal bottles
- Z Cure: 12 oz, 1 gal bottles & 5 gal pails

SAFETY & STORAGE

Follow Safety Data Sheets for additional information. 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.

KWIK BOND POLYMERS
923 Teal Dr
Benicia, CA 94510 USA
Phone: +1-866-434-1772
www.kwikbondpolymers.com

SIKA CORPORATION
201 Polito Avenue
Lyndhurst, NJ 07071 USA
Phone: +1-800-933-7452
Fax: +1-2019336225
www.usa.sika.com