

526

EPOXY MULTI-LAYER RAPID SET SKID RESISTANT / HI-FRICTION POLYMER OVERLAY FOR BRIDGE AND PARKING DECKS



FORMULATED AND LABELED FOR PROFESSIONAL USE ONLY
NOT FOR SALE TO OR USE BY THE GENERAL PUBLIC

PRODUCT DATA

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526 HI-FRICTIONS SKID-RESISTANT POLYMER OVERLAY

Formulated to comply with the Rapid Strength development and minimum closure requirements as established by AASHTO Task Force 34 Epoxy Polymer Concrete Bridge Deck Overlays and ACI 548 Type EM (Epoxy Multi-Layer) Polymer Overlay for Bridge and Parking Garage Decks. Meets and exceeds the requirements of ASTM C 881 Type III (Exception an improved gel time) for use in bonding skid-resistance, high-friction surfacing overlay materials.

DESCRIPTION

E-Bond 526 is a 2-component 100% solids, Zero VOC, Moisture-Tolerant Epoxy polymer that provides long term impermeable protection of the underlying reinforcing from the corrosive effect from chloride ions penetration. E-Bond 526 provides a Skid-Resistant High-Friction wearing surface for bridge and parking decks with a unique Low-Modulus of Elasticity allowing the 526 Epoxy Polymer Overlay to accommodate variations in stress due to thermal and mechanical movement of the substrate.

E-Bond 526 is recommended as a Multi-Layer Polymer Overlay as a minimum for the necessary impermeable protection. The 1st layer is applied as a penetrating sealer/bonding agent to bond the broadcast aggregate to the substrate while also filling fissures and voids in the substrate which creates out gassing (releasing of air from the concrete), through the 1st layer leaving minute pinholes. The 2nd layer is necessary to seal any remaining pinholes/voids and to encapsulates the 1st lift aggregate and securely bonds the 2nd layer of broadcast aggregate.

E-Bond 526 has a highly successful 20 year track record with more than 12 million square feet in place across United States and Canada as a waterproofing and anti-skid overlay with deicing capability to reduce or prevent frost and ice formation on Bridge and Parking Decks. There are thousands of bridges with E-Bond 526 Overlay in place exposed to extremes of weather with over 15 years of service life while maintaining waterproofing integrity indicated by low levels of chloride ions and retention of skid/friction properties measuring in the 50's.

FEATURES

- Rapid strength development in warm /cool weather
- Provides a highly impermeable system to protect the reinforcing steel from the corrosive effect of Chloride ions penetration.
- Skid Resistant
- Unique Low Modulus
- Self Priming
- Light-weight protective overlays
- Withstands vehicular traffic
- Simple 1 to 1 mix ratio by volume
- Good chemical resistance

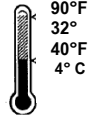
BENEFITS

- Minimizes bridge closure time and traffic disruption. Excellent for heavy traffic industrial flooring, safety for vehicles and pedestrians
- ¼ inch of 526 polymer overlay is 20 times more impermeable than 2 inches of concrete.
- Retains skid number above 50 for extended period of time
- Accommodates variations in stress due to thermal and mechanical movement, excellent for thin-set mortar and grouting
- Reduces closure time
- Limits dead load in suspended structures
- Extends the service life of decks
- Convenient easy to use
- Long-term protection to icing solutions and automotive fluids

WHERE TO USE

- When an impermeable waterproof/skid resistant overlay is required to protect new and existing bridge decks against the damaging effects of the intrusion by chloride ions.
- As a rapid set overlay installation when quick turnaround times are required throughout a wide temperature range
- As a skid-resistant system for parking decks, loading docks and ramps
- As a skid-resistant coating for steel decks, warehouse floors
- Airport runways
- As a low modulus patching mortar for spalls and deck delamination's
- As a single coat system for skid proofing asphalt surfaces
- A Hi Friction/Skid resistant single coat surfacing for asphalt surfaces.

EPOXY MULTI-LAYER RAPID SET HI-FRICTION SKID RESISTANT POLYMER OVERLAY FOR BRIDGE AND PARKING DECKS

PHYSICAL PROPERTIES (Material and curing conditions @ 75°F (24°C) and 50% R.H.)		For Best Performance  <ul style="list-style-type: none"> Precondition the components to 70°F (23°C) to 80°F (27°C) for 24 hours before use. Minimum ambient, surface, aggregate and epoxy temperatures should be 50°F (10°C) and rising at the time of application. Store at 40°F (4.4°C)-95°F(35°C) Protect from moisture. Protect from freezing. Do not add solvents or water to epoxy material. Do not alter or change the recommended proportions when blending the components.
Mixing Ratio: Component A/B	1:1 by volume	
Viscosity: ASTM-D-2393 (poises)	15-30	
Gel Time: ASTM-C-881 (60 g) (minutes)	15-30	
Tensile Properties: (ASTM-D-638) Type I 7 day		
Tensile Strength	2500-5000 psi (17-34 MPa)	
Elongation at Break	30-80%	
Adhesive Strength ASTM C 1583 – 04 (mixed with aggregate) min. 250 psi (MPa 1.7)	250+ psi(Mpa)	
Bond Strength: (ASTM-C-882) 2 day (moist cure) Plastic concrete to hardened concrete	1600 psi (11) min.	
VOC mixed	0 g/l	
Compressive Properties: (ASTM-C-579) Method B 3 hour Minimum		
1 day	1000 psi (6.g/19 Mpa)	
7 day	5000 psi (34 Mpa) 6500 psi (45 Mpa)	
Compressive Modulus ASTM D 695 14 day	130,000 psi (896 Mpa) max.	
Thermal Compatibility ASTM C 884 (Mixed with aggregate) 7 days	No delaminations	
Water Absorption: (ASTM-D-570) 7 days	0.4%	
Permeability of Chloride Ions AASHTO T277 28 days (less than 100 coulombs)	73 (negligible)	

Rapid Set times Minimum Closures times in Warm and Cool Weather Applications										
Layers	Average Temperature of Deck, Epoxy, and Aggregate Components in °F (°C)									
	85+ (29+)	84-80 (29-27)	79-75 (26-24)	74-70 (23-21)	69-65 (21-18)	64-60 (18-16)	59-55 (15-13)	*54-50 (12-10)	*49-45 (9-7)	*44-40 (7-4)
Hours	1	1½	1¾	1¾	2	2	2¼	2½	2¾	3

*It is highly recommended that all components be conditioned in advance of use to 75°F (24°C). This may take 48 hrs. It is to the contactors benefit to maintain the components at elevated temperatures. At lower temperatures (<55°F), the resin will be become difficult to remove from containers and to mix properly.

Minimum Epoxy & Aggregate Coverage Rates (2 Layer System for Concrete & Steel)		
	Epoxy Rate Gallons/100 ft ² (Liters/sq m ²) *	Aggregate Rate**
Layer 1	2 ½ per gallons per 100 ft ² (1 gal./ 40 ft ² 1 L/M ²)	10 lbs/yd ² (5.4 kg/M ²)
Layer 2	5 gallons per 100 ft ² (1 gal. /20 ft ² 2 L/M ²)	14 lbs/yd ² (7.6 kg/M ²)
*Total epoxy applied must equal no less than 7 ½ gal/100 ft ² (3 L/M ²) more or less if aggregate used is larger or smaller than as specified in Aggregate Chart. A grooved deck may require more epoxy polymer.		
Minimum Epoxy & Aggregate Coverage Rates for 1 Layer Applications on Asphalt		
	Epoxy Rate ft ² / gal. (mils)	Aggregate Rate**

Layer 1	4 gallons per 100 ft ² (64 mils – 1/16")	15 lbs/yd ²
**Application of aggregate shall be of sufficient quantity until a dry layer of aggregate is present on the entire surface. If wet spots develop broadcast additional aggregate until a dry surface is re-established.		

Broadcast Aggregate for Bridge Decks				
Mesh/Metric	#4 / 4.75 mm	#8 / 2.36 mm	#16 / 1.18 mm	#30 / 0.600 mm
% PASSING	100	30-75	0-5	0-1
Broadcast Aggregate for Parking Decks				
Mesh/Metric	#16 / 1.18 mm	#20 / 0.850 mm	#30 / 0.600 mm	#40 / 0.425 mm
% PASSING	51-75	14-50	0-25	0-2

Aggregate shall be angular shaped silica, basalt, or other nonfriable aggregate with a hardness of 6.5 or greater clean and dry (less than 0.2% moisture, ASTM C 566), free from dirt, clay, asphalt, and other organic materials.

Check List:

- ✓ Recommend Two (2) layer applications based on a proven record of more than twenty (20) years of maintaining low levels of chloride ion intrusion. A single layer has indicated that within two (2) years a breakdown of protection against chloride ion intrusion will occur.
- ✓ It is not recommended to allow traffic on epoxy polymer overlays between lifts. The 1st layer of epoxy is applied at insufficient thickness to encapsulate a minimum of ½ the height of the aggregate. When epoxy is not fully set in cool weather, applications of heavy traffic can dislodge the aggregate.
- ✓ Set time is established by placing a blunt object (a coin, key etc.) against the top profile of the aggregate. The epoxy overlay is sufficiently set to open to traffic if the aggregate chips or breaks away at the top edge of the aggregate without rupturing or marring the base epoxy.
- ✓ Review curing schedules based on product and substrate.
- ✓ Polymer concrete overlay materials shall not be placed when weather or surface conditions are such that the material cannot be properly handled, placed, and cured within the specified requirements of traffic control.
- ✓ There shall be no visible moisture present on the surface of the concrete at the time of application of the polymer concrete overlay. Moisture should be tested by placement of a plastic sheet left taped in place for a minimum of 2 hr (ASTM D4263)
- ✓ Finished application is a vapor barrier, and is not recommended for on-grade exterior slabs (bridge ramps) where moisture-vapor transmission is a concern. If required consult E-Bond Technical Service re the use of a Moisture Barrier reduction coating.
- ✓ Do not place the epoxy polymer overlay on new concrete/patches less than 28 days of age (If earlier times are required contact E-Bond Technical Service).
- ✓ Magnesium phosphate patching materials require 30 days of curing before being overlain in to allow generated gasses to escape and special attention to roughened surface.
- ✓ Do not apply epoxy binder material on a wet surface or when anticipated weather conditions would prevent the proper application of the Epoxy Polymer Concrete Overlay.

SURFACE PREPARATION

Surface Preparation is everything for the long term performance of the Epoxy Polymer Overlay. All soft weak surface mortar laitance or carbonation must be removed to allow the epoxy compound to bond to the aggregate within the concrete matrix.

Quality Assurance Requirement to Qualify the Concrete Substrate and Verify Adequate Surface Preparation

Prior to the application of the 1st lift of the 526 polymer place a minimum of 3 test patches (approx. 1.5 ft. x 3 ft.) for every 300 yd² in the wheel patch lanes or in other areas that represent a worst surface condition, Test in accordance with ASTM C 1538 "Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)" Tensile Rupture Test. The test failure should not be in the polymer overlay or the bond of the overlay to the substrate. The failure should be in the concrete substrate. The evaluation shall be the average of the three tests for each location which should have a pullout value of not less than 250 psi (1.7 MPa) with more than 50 percent of the failure area in the concrete at a depth of 1/4 in. (6 mm) or greater.

Concrete

All surfaces must be prepared to a structurally dense surface to expose coarse aggregate and reveal an open texture surface. Remove weak, contaminated deteriorated concrete, asphalt materials, oils, dirt, rubber, curing compounds, paint, carbonation, laitance, and other potentially detrimental materials by shot-blasting, bush hammering or other suitable mechanical means. Surface preparation by grinding or milling creates minute fractures or micro cracking in the substrate and leaves behind a concrete slurry or paste residue that is detrimental to the bond of the epoxy polymer overlay which necessitates shot blasting to remove the dried slurry and micro cracks.

Hydro-demolition with ultra-high hydro blasting may leave irregular surface profiles leading to increased water absorption as well as concrete slurry or paste on the surface that is detrimental to the bond of the epoxy polymer overlay requiring removal by shot blasting.

Steel

Steel should be cleaned and prepared by sandblasting to conform to SSPC-SP10 Specification with a 4 mil (0.1mm) minimum anchor profile. If oil is present on the surface the

reuse of shot blast or sandblast media is not recommended to avoid re-contaminating the prepared surface. If flash rust appears, the surface must be re-blasted to obtain the minimum anchor profile. The overlay is to be applied within the hour after preparation and before flash rushing.

Asphalt

New asphalt pavement - It is recommended that a period of two weeks to a month be allowed for the pavement to oxidize by trafficking.

Existing asphalt pavement - Prior to application of the 526, the entire area must be power washed 20.7-48.3 MPa (3,000 - 7,000 psi) with a mild detergent to remove all dirt, grime, oil and loose contaminants that might affect the bond between the epoxy binder material and existing surfaces. Surfaces must be clean and dry; a hot compressed air lance may be required.

Removal of existing overlays, asphalt etc.: Best removed by scarification, milling, grinding, bush hammering etc. Usually creates minute micro-cracking in the substrate requiring Surface Preparation to a structurally dense surface with an ICRI profile of CSP #5.

Cleaning: If traffic has been allowed on the prepared surface or more than 7 days have elapsed since preparation, the surface will require additional cleaning to remove the early formation of carbonation and contamination by sandblasting (if permitted by local regulations due to health and environmental issues).

Blow, sweep or power-sweep the surface area to be treated. Blow loose material from visible cracks using oil free, high pressure air blast.

Temperature Effects: Mixing, Application & Working Time
Epoxy and substrate temperatures have a direct effect on the usability of the epoxy compound. The quantity and temperature of the adhesive at time of mixing have a significant influence on the working time. Elevated temperatures will thin the epoxy making it easier to apply but will shorten the working time in the container resulting in less open time before early polymerization thereby affecting the bonding ability of the broadcast aggregate. Cooler temperatures thicken the epoxy, lengthen the working time in the container and extend the open time prior to the placement of the broadcast aggregate. Because of the fast cure rate of E-Bond 526 do not mix a quantity of epoxy at any one time that cannot be readily applied within the pot life in the container and the working time on the substrate at the prevailing temperature. Contact E-Bond Technical Service for assistance of the gel time in the container and working time on the substrate at different temperature ranges.

MIXING

For best results, prior to mixing condition the components to 70°- 85°F (21°- 29°C).

Mechanical Proportioning, Mixing: Place 1 volume-of the resin Component (A) and 1 volume of the hardener component (B) into pre-calibrated flat wall and bottom containers. Dump the calibrated amounts into a clean

oversize mixing containers. Mix thoroughly for a minimum of three minutes using a low speed drill (600 rpm) and a mixing paddle (e.g. a Jiffy® and/or Plunge Mixer™). Keep the paddle below the surface material to avoid entrapment of air. During mixing it is important to carefully scrape the sides

and bottom of the mixing container to ensure thorough mixing of the components. . Mix only the amount of material that can be used before the working time expires during application of the surface treatment system.

Automatic Proportioning, Mixing: Mixing equipment that will automatically and accurately proportion the components in accordance with the manufacturer's recommendations (+/- 2 percent by volume), mix and continuously place the polymer overlay.

For assistance in the curing process when the substrate temperature is 75°F and falling, it is recommended that both components be preheated up 90±10°F (32.2°C) prior to blending. The operation should proceed in such a manner that will not allow the mixed material to separate, dry, be exposed or otherwise harden in such a way as to impair the retention and bonding of the high friction/Skid resistant surfacing aggregate.

APPLICATION

Concrete & Steel

Multi Layer Epoxy Overlay Systems consist of two distinct steps: applying an epoxy polymer and a specified aggregate in two separate layers at the minimum polymer and aggregate application rates for the individual layers. (See application rate chart on page 2).

1. The deck should be marked in sections to provide a visual guide to insure that the mixed quantity is applied at the specified rate (thickness).
2. The mixed epoxy polymer is placed on the surface and immediately and uniformly spread by a notched squeegee at the coverage rate. Use continuous mixes (every 3 minutes), placing each successive mix immediately behind the former.
3. Each batch should be dumped within 6 minutes and aggregate broadcasted immediately within 10-45 minutes (Hot/Cool substrate) until a dry layer of aggregate is present over the entire surface. If wet spots develop, immediately broadcast additional aggregate until a dry surface is re-established. Accomplish aggregate broadcast while the epoxy is still fluid, but keep a wet edge.
4. In cool weather applications 50-59°F (10-15°C) precondition all components to 80-100°F (27-38°C) before mixing and applying (consult E-Bond Technical service for other alternates). For cool applications a hand operated roller may be necessary to ensure the aggregate penetrates the cool resin.

5. After the first layer of the overlay has cured, remove by brooming, or a high power vacuum or sweeper all excess unbounded aggregate.
6. Repeat the application procedure for subsequent layers with coverage rates as specified for the 2nd layer. The maximum recoat window is 24 hours.

Asphalt- Follow application steps 1 through 5 above.

PATCHING SPALLS, HONEYCOMBED AREAS, DELAMINATIONS, SMALL AND LARGE HOLES

Procedure:

Patches for spalls and repair areas greater than 1/2" (13mm) in depth should be saw cut 1-1½" deep depending on the depth of the repair and at least 2-3" beyond the perimeter of the repair area. USE CAUTION TO AVOID SAW CUTTING ANY STEEL.

All concrete within the saw cut must be removed to the depth of the repair area. After removal the area should be sandblasted followed by an air blast to remove loose material and dust.

Application:

1. Pre-prime the surface with E-Bond 526 correctly mixed at 1:1 by volume.
2. To the mixed E-Bond 526 add approximately 2 ¾ to 3 ½ volumes of 20 to 40 mesh washed and oven dried (or dry broadcast aggregate) aggregate to one volume of the mixed epoxy. Thoroughly blend the aggregate with the mixed epoxy components (mortar mixer) to a uniform mixture.
3. Dump the mixed mortar onto the primed epoxy surface. Hard trowel the epoxy mortar to be flush with the deck. Excessive working of the epoxy mortar surface will bring resin to the top creating some resin float. Broadcast aggregate to refusal onto the leveled surface
4. For large applications use screed box and a walk-behind trowel (designed for epoxy). Allow to cure. A terrazzo grinder can be used to remove high spots and ensure a continuous surface. Vacuum up any loose material.

Machine mixing for Mortars and Patching Compounds:

The polymer and aggregate for epoxy mortars/patching compounds can be machine mixed in small concrete or mortar mixers. Mix the components for 2-3 minutes prior to adding the filler aggregate. The proper ratio of resin-to-curing agents and polymer-to-aggregate for each batch should be maintained

Note: Traffic shall not be allowed on the prepared deck surface prior to the application of E-Bond 526. A bond test in accordance with ASTM C 1538 "Standard Test Method for Tensile Strength of Concrete Surfaces and Overlay Materials by Direct Tension (Pull-off Method) is recommended to verify proper surface preparation

AS A WATERPROOFING MEMBRANE BETWEEN ASPHALT OVERLAY AND CONCRETE: Spread the mixed 526 by a notched trowel or squeegee at the rate of 40ft² per gallon (1.0m²/L). Place the epoxy in continuous operation. Broadcast a coarse aggregate approximately 16 to 20 mesh size. Allow to cure sufficiently to remove all loose aggregate. Asphalt topping can be applied after 24 hours.

Proper application is the responsibility of the user. Field visits by E-Bond personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

CLEAN-UP: Ventilate area. Confine spill. Collect with absorbent material. Dispose of in accordance with current, applicable local, state, and federal regulations. Uncured material can be removed with approved solvent. Cured material can only be removed mechanically. Clean tools and equipment with xylene immediately after using. Wash hands and skin with soap or Industrial hand cleaner, not with solvent. Cured material must be removed mechanically.

Shelf Life: 1 year in original unopened container.

Storage: Store Dry at 40°F (4.4°C)-95°F(35°C) .Condition to 65°F (18°C)-75°F(24°C) before using. Protect from inclement weather and freezing.

Packaging: Available in 2 gallon units, 10 gallon units and 110 gallon units. Totes available upon request.

VOC Content:

0 lbs/gal or 0 g/L, less water and exempt solvents

CAUTION - For professional use only; not for sale to or use by the general public. E-Bond's epoxies contain alkaline amines. Strong sensitizer; MAY CAUSE SKIN SENSITIZATION or allergic response ranging from a mild wheezing to a severe asthmatic type attack. Avoid contact with skin or eyes. IN CASE OF CONTACT immediately wash skin with soap and water. Flush eyes with water and obtain medical attention. Wear protective clothing, goggles, and barrier cream on all exposed skin.

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