

526 / 526S

# EPOXY RAPID SET MULTI-LAYER / HIGH FRICTION TREATMENT STANDARD & THIXOTROPIC SYSTEMS FOR CONCRETE & ASPHALT SURFACES

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



## PRODUCT DATA

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E-BOND 526 & 526S, are formulated as rapid set polymers providing minimal closure times with a unique Low-Modulus of Elasticity as a Multi-layer and a Single Layer Hi-Friction Skid Resistant Treatment. E-Bond 526S is a sag-resistant Thixotropic Epoxy Polymer designed for placement on Ramps and Horizontal Curves with slopes greater than 3 degrees. Both products are formulated to comply with AASHTO Task Force 34 Epoxy Polymer Concrete Bridge Deck Overlays, ACI 548 Type EM (Epoxy Multi-Layer) Polymer Overlay for Bridge and Parking Garage Decks. Both meet and exceed the requirements of ASTM C 881 Type III (exceptions an improved gel time for rapid set times and a creamy consistency for the thixotropic polymer).

## DESCRIPTION

E-Bond 526 and 526S are dual purpose two-component Moisture-Tolerant Epoxy 100% solids polymers for:

- Multi-Layer providing a high friction impermeable protection of the underlying reinforcing steel in concrete substrates from the corrosive effect of chloride ions penetration. The 1<sup>st</sup> layer is applied as a penetrating sealer/bonding agent to penetrate cracks, fissures and voids in the substrate replacing moisture/vapor as outgassing through the film. The 2<sup>nd</sup> layer is necessary to seal any remaining pinholes/voids, securely bonding of the 2<sup>nd</sup> layer of Hi Friction/ Skid Resistant aggregate.
- High Friction Surface Treatment (HFST) as a Single Layer 100% solids single lift High Friction/Anti-Skid Epoxy System for asphalt, concrete and other surfaces. It enhances the Hi-friction/Anti-Skid properties of the driving surface to reduce accidents and fatalities by improving braking distances, reduced skidding, hydroplaning and improves driver awareness. Recommended for Horizontal Curves and Ramps, Intersections/Intersection Approaches, Steep Grades, Roundabouts and other areas where improved safety is desired.
- Thixotropic Applications for Ramps and Horizontal Curves greater than 3 degrees. Thixotropic Epoxy Polymers thin out during the stress of the application and then rapidly revert back to their thixotropic consistency. Non-thixotropic properties of polymer overlays allow runoffs on slopes greater than 3 degrees. E-Bond 526S is a sag-resistant Thixotropic Epoxy akin to non-drip paints that go through a reversible change from the original creamy substance to temporary thin out from friction created by brushing, roller or squeegee, and when the shearing action ceases the material settles back into its original consistency. Designed to be placed at a unified even thickness and remain in place to adequately encapsulate the required embedment of the Hi Friction aggregate.

**Applications of Epoxy Multi-Layer Skid Resistant Polymer Overlays installed as far back as 1984 are still in service providing protection of the underlying reinforcing steel with excellent retention of Hi Friction Properties.**

## FEATURES

- Rapid strength development in warm /cool weather
- Multi-Layer provides a highly impermeable system to protect the reinforcing steel from the corrosive effect of Chloride ion penetration
- HFST a Single Layer Skid Resistant Application
- Unique Low Modulus
- Self Priming
- Light-weight protective overlays
- Withstands vehicular traffic
- Simple 1 to 1 mix ratio by volume
- Good chemical resistance
- Zero VOC

## BENEFITS

- Minimizes bridge closure time and traffic disruption. Excellent for heavy traffic industrial flooring, safety for vehicles and pedestrians  
1/4" 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
- Fully Reactive- no low boiling constituents

## WHERE TO USE

• 526 Multi-Layer an impermeable waterproof/skid resistant overlay to protect new and existing bridge decks against the damaging effects of the intrusion by chloride ions. • 526 as single layer for High Friction Surface Treatment where increased friction demands are required for concrete and asphalt substrates at horizontal curves, intersections, exit-entrance ramps, steep grades, bridges, and other identified areas. • As a rapid set overlay installation when quick turnaround times are required throughout a wide temperature range • as a low modulus patching mortar for spalls and deck delamination's • 526S as a thixotropic sag resistant application for both Multi-Layer & HFST with surface slopes greater than 3°eg. **Crossover slopes and grades prevalent on hazard curves, ramps, flyover bridges, entrance/exit ramps and commercial ramps**

## TECHNICAL INFORMATION

PHYSICAL PROPERTIES (Material and curing conditions @ 75°F (24°C) and 50% R.H.)		
Property / Test Method	526	526S (Sag-Resistant)
<b>Mixing Ratio:</b> Component A/B	1:1 by volume	1:1 by volume
<b>Viscosity:</b> ASTM-D-2393 (poises)	15-30	30-40 creamy consistency
<b>Gel Time:</b> ASTM-C-881 ( 70 ml) (minutes)	15-30 minutes	15-30 minutes
<b>Tensile Properties:</b> (ASTM-D-638) Type I 7 day Tensile Strength Elongation at Break	2500-5000 psi (17-34 Mpa) 30-80%	2500-5000 psi (17-34 Mpa) 30-80%
<b>Adhesive Strength</b> ASTM C 1583 – 04 ( mixed with aggregate) min. 250 psi (MPa 1.7)	250+ psi (1.7 Mpa) Asphalt >100psi (0.69Mpa)	Concrete >250 psi (1.7 Mpa) Asphalt>100psi (0.69Mpa)
<b>Bond Strength:</b> (ASTM C 882) 2 day (moist cure) Plastic concrete to hardened concrete	1600 psi (11Mpa) min.	1600 psi (11Mpa) min.
<b>Compressive Properties:</b> (ASTM C 579) Method B 3 hour Minimum 1 day 7 day	1000 psi (6.9 Mpa) 5000 psi (34 Mpa) 6500 psi (45 Mpa)	1000 psi (6.9 Mpa) 5000 psi (34 Mpa) 6500 psi (45 Mpa)
Compressive Modulus ASTM D 695 14 day	130,000 psi (896 Mpa) max.	130,000 psi (896 Mpa) max.
<b>Thermal Compatibility ASTM C 884 (Mixed with aggregate)</b> 7 days	No delaminations	No delaminations
<b>Water Absorption:</b> (ASTM D 570 / Tex-614-J) 7 days	<0.1%	<0.1%
<b>Permeability of Chloride Ions AASHTO T277 28 days</b>	73 (negligible)	73 (negligible)
<b>Flashpoint</b> (ASTM D 1310)	221°F (105°C)	221°F (105°C)
<b>VOC mixed</b>	0 g/l	0 g/l
<b>Shelf Life:.</b>	1 year in original unopened container.	
<b>Storage:</b>	Store Dry at 40°F -95°F (4-35°C) Protect from inclement weather and freezing.	

### For Best Performance

- 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.



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 contractors 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 <sup>2</sup> (Liters/sq m <sup>2</sup> ) *	Aggregate Rate**
Layer 1	2 ½ per gallons per 100 ft <sup>2</sup> (1 gal./ 40 ft <sup>2</sup> 1 L/M <sup>2</sup> )	10 lbs/yd <sup>2</sup> (5.4 kg/M <sup>2</sup> )
Layer 2	5 gallons per 100 ft <sup>2</sup> (1 gal. /20 ft <sup>2</sup> 2 L/M <sup>2</sup> )	14 lbs/yd <sup>2</sup> (7.6 kg/M <sup>2</sup> )
*Total epoxy applied must equal no less than 7 ½ gal/100 ft <sup>2</sup> (3 L/M <sup>2</sup> ) 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 <sup>2</sup> / gal. (mils)	Aggregate Rate**
Layer 1	4 gallons per 100 ft <sup>2</sup> ( 64 mils – 1/16")	15 lbs/yd <sup>2</sup>
**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 on concrete based on a proven record of more than twenty (20) years of maintaining low levels of chloride ion intrusion.
- ✓ It is not recommended to allow traffic on epoxy polymer overlays between lifts. The 1<sup>st</sup> 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.
- ✓ A single layer for High Friction Surface Treatment for concrete and asphalt substrates where increased friction demand is required at horizontal curves, intersections, exit-entrance ramps, steep grades, bridges etc.
- ✓ Slope surfaces specify a thixotropic epoxy
- ✓ 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. Compressed air may be used to dry the deck.
- ✓ Finished Multi-Layer applications produce a vapor barrier, and are 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

## **SURFACE PREPARATION**

Surface Preparation is everything for the long term performance of the Multi-Layer Epoxy Polymer Overlay and HFST Applications.

- **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.

- **Concrete Substrates:**

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.

- **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 1-1 1/2" 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.

- **Patching 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 3/4 to 3 1/2 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

- **Polymer Application**

All concrete 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

Note: Traffic shall not be allowed on the prepared deck surface prior to the application of E-Bond 526.

**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

- **Asphalt**

All surfaces are to be prepared a clean, structurally sound, with an open porous surface free of all, asphaltic material, oil, dirt, rubber, curing compounds, paint carbonation, or other potentially detrimental materials that would adversely affect the bond of or curing of the HFST treatment.

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

**Existing and new asphalt pavement** - Prior to application of the HFST the entire area must be prepared by shot-blasting, sandblasting (if permitted by local regulations due to health and environmental issues) or light grinding to remove all dirt, grime, oil and loose aggregate, debris, and deleterious material. Mechanically vacuum sweep to remove all dust, debris, and deleterious material. If the substrate is to be cleaned by power washing use a detergent (DAWN® Soap) with hot water. Allow the surface to dry for at least 24 hours prior to the application of the HFST

### **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 Polymer treatment must be applied within the hour after preparation and before flash rushing

**AS A WATERPROOFING MEMBRANE BETWEEN ASPHALT OVERLAY AND CONCRETE:** Spread the mixed 526 by a notched trowel or squeegee at the rate of 40ft<sup>2</sup> per gallon (1.0m<sup>2</sup>/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

### **Qualification of Adequate Surface Preparation.**

It is strongly recommended that prior to commencement of a full scale application that a pilot area be tested 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)" to verify the adequacy of the surface preparation. Adequate surface preparation will indicate a failure in the substrate not in the polymer or the bond of the polymer to the substrate. An acceptable failure should be with more than 50 percent of the failure area in the substrate at a depth of 1/4 in. (6 mm) or greater.

•For Concrete: the pullout value should not be less than 250 psi (1.7 MPa),

•For asphalt the pull-off value should be at least 100 psi (0.069 MPa),

**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 equal volumes of the resin Component (A) and hardener component (B) into an oversized pre-calibrated flat wall and bottom container. 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 Metering Mixing Equipment:**

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. Clean the mix head and delivery lines if application of the mixed resin binder is stopped for more than 10 minutes.

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.

**IMPORTANT NOTICE: Precautions when using automatic metering, mixing and transfer equipment.**

Prior to using an automatic metering, mixing and transfer equipment it is mandatory to ensure accurate metering of each component and thorough mixing. Purge the components through the static mixing nozzle until all material dispensed is uniform in color.

**Recommended Quality Assurance of Layer Thickness**

**Placement** (See application rate chart on page 3).

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 volume of mixed epoxy placed in each section will be recorded and calibrated for confirmation that the minimum coverage rate has been placed. ( see pg. 3)

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.

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

**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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