



**BUILDING
STRENGTH™**

**BRIDGE DECK
OVERLAY SYSTEM BROCHURE**

**CONCRETE
CONSTRUCTION
SOLUTIONS**

BROCHURE

 **UNITEX®**
By Dayton Superior

The Challenge: Cost Effective Protective Bridge Deck Overlay

In 2013, the American Society of Civil Engineers (ASCE) released their Report Card for America's Infrastructure. The state of the country's bridges received a C+. Bridges are built to last approximately 50 years. The average age of U.S. bridges is now 42. Of the approximate 610,000 rural and urban bridges in the United States, more than 24% are considered functionally obsolete or structurally deficient. The stresses affecting the nation's bridges will only increase as traffic volumes rise and the demand for heavier semi freight loads grows.

U.S. Bridge Statistics

	2011	2012	2013	2014
All Bridges	605,103	607,380	607,751	610,749
Structurally Deficient Bridges Total	68,759	66,749	63,522	61,365
Functionally Obsolete Bridges Total	84,832	84,748	84,348	84,525
Percent in Either Category	25%	25%	24%	24%

Source: *Deficient Bridges by State and Highway System*, U.S. Department of Transportation, Federal Highway Administration



The Solution: Bridge Deck Overlay System

A bridge deck overlay application consists of two coats of an advanced polymer epoxy that quickly develops a high tensile strength to seal, protect and extend the life of bridge decks in both new and restoration construction. This economical and highly effective method blends an epoxy binder that is applied evenly to the bridge deck surface. Aggregate is immediately applied over the binder, increasing the texture depth of the pavement and providing a long-lasting seal to protect the bridge deck from the effects of traffic and harsh weather conditions.

In addition to the protective seal, the bridge deck overlay provides increased pavement grip in wet or dry conditions resulting in fewer accidents and more saved lives.



[Watch the video on YouTube: qmbIHdKb3Jw](#)

The Bridge Deck Overlay Protection Advantage

- Improves the pavement condition by creating a highly durable surface that is flexible and waterproof
- Extends deck life and serviceability vs. costly replacement
- Significantly lighter than typical concrete overlays which require a thicker application
- Allows for better support of high traffic volumes and heavy freight loads, reducing the bridge deck's deterioration rate
- The durability and reduced deterioration results in decreased maintenance costs over the life of the bridge deck
- Produces a surface that is resistant to chemicals that can often cause corrosion on the bridge deck surface, such as fuel, de-icer and motor oil
- Primer-less system
- Long lasting. A study by the Virginia Transportation Research Council confirms "It is reasonable to expect them to maintain high friction values for 10 years of service."

The Bridge Deck Overlay Safety Advantage

- Reduces stopping distance, hydroplaning risk and provides higher skid resistance. At 60 MPH (on wet or dry pavement), bridge overlay can reduce stopping distances up to 40%. According to the FHWA, 70% of wet pavement crashes can be affected by friction improvements.
- Only low cost, active protection solution suggested by the FHWA not dependent on driver response.
- Low cost, bridge overlay is classified by the FHWA as a low cost safety solution that qualifies for 100% safety funding under highway safety improvement programs.

Source: Using High Friction Surface Treatments To Improve Safety At Horizontal Curves (published July 2012). The Texas Transportation Institute of The Texas A&M University System. According to The Texas Transportation Institute, if the site experienced an average of 1 crash per year prior to application and that average is reduced by even 20% after application, the HFST remains a cost-effective solution in crash reduction. The Texas Transportation Institute utilized the economic values of crash scenarios set forth by an FHWA study that found the average cost of all classifications of fatal and injury crashes is estimated at \$158,177. However, the cost of one fatal crash is considered to be more than \$4 million.





The Unitex[®] by Dayton Superior[®] Bridge Overlay Product Solution

State DOTs across the U.S. turn to Unitex by Dayton Superior for epoxy product solutions used for bridge overlay applications.

Unitex by Dayton Superior was among the first to apply advanced polymer technologies to develop a high tensile strength epoxy binder for skid-resistant bridge deck overlays. Unlike rigid epoxies, Unitex's Pro-Poxy Type III DOT was engineered to offer the flexibility to expand and contract with the concrete in all weather conditions on Bridge Overlays and elevated slabs.

In recent years, the high tensile strength and low modulus, low viscosity properties of Unitex's Pro-Poxy Type III DOT have made it the bonding product solution of choice for high friction aggregates used in bridge overlay applications across the country.



Bridge Deck Overlay and Pro-Poxy Type III DOT Case Studies

KANSAS – Wichita I-135 Flyover Resurfacing 14.4 lane miles (100,000 square yards)

- The use of Pro-Poxy Type III DOT in the 2.4 mile resurfacing of the I-135 flyerover north of Wichita allowed for a significant savings of time and labor compared to similar projects using other methods.
- Future Protection – the new bridge deck overlay creates a seal nearly impervious to harsh weather conditions and chemicals such as de-icers ultimately extending the life of the I-135 Flyover and reducing maintenance costs.

LOUISIANA – Morganza Floodway Elevated Bridge Deck, US 190 East

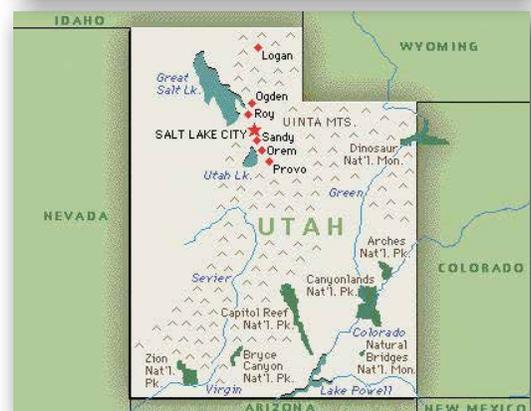
- Largest and Most Complex Project in US – with the project covering over 18,778 linear feet this was the largest project in the United States to Date.
- Extended Bridge Life – Over 200,000 square yards of bridge deck was covered with the Pro-Poxy Type III DOT Overlay system extending the life of the 67 year old bridge deck and saving government funds from having to replace 3.5 millions of elevated bridge.
- Safer Surface – more than 78,000 gallons of epoxy and 2,500,000 pounds of high friction aggregate were used to install the two-layer system that protected the bridge deck and created a safer high friction surface for vehicles.

NEW MEXICO – Rio Grande Bridge Deck, Interstate 40, Route 21

- Bridge overlay was applied on five traffic lanes and two emergency lanes on each side of the bridge deck.
- Using bridge overlay allowed for limited lane closures to accommodate the bridge deck's high traffic volumes.
- The project set a new world record for bridge overlay installation with 14,000 square yards of bridge overlay applied in one working session.

UTAH – Replacement of 55 Bridges

- Bridge overlay was used on 55 new bridge decks, totaling approximately 1.1 million square feet
- Unitek built a mechanical pump system, specifically to apply the bridge overlay for this project
- Pro-Poxy III DOT met the Utah Department of Transportations specifications due to the ability to withstand extreme weather conditions, thermal cycles, snow plow use and heavy traffic



How to specify Unitex by Dayton Superior Pro-Poxy Type III DOT

Part 2 - Products

2.01 Manufacturer

- A. Pro-Poxy Type III DOT, as manufactured by Dayton Superior, 3101 Gardner Ave, Kansas City, MO 64120, 800-821-5846

2.02 Materials

- A. Epoxy resin adhesive binder:
1. Epoxy resin system shall be a 100% solids, exothermic urethane curing system.
 2. The ratio of Component "A": Component "B" shall be 1:1 by volume.

2.03 Performance Criteria

- A. Epoxy Binder Characteristics

PROPERTY	REQUIREMENTS	TEST METHOD
Mix Ratio	1:1 by volume	
Viscosity	7-25 poises	ASTM D2393, Brookfield RVT Spindle No. 3 at 20 rpm
Gel time	15-45 min.	ASTM C881
Compressive strength	Minimum of 6.9 MPa (1,000 psi) at 3 hrs. Minimum of 34.4 MPa	ASTM C579 modified (with plastic inserts)
Tensile strength (neat)	13.8-34.4 MPa (2,000-4,000 psi) at 7 days	ASTM D638
Elongation (neat)	30-70% at 7 days	ASTM D638
Adhesive strength (mixed with aggregate)	Minimum of 1.7 MPa (250 psi) or concrete failure at 24 hrs.	ACI 503R, Appendix A, VTM 92
Permeability to chloride ion	Maximum of 100 coulombs at 28 days	AASHTO T277
Absorption	Maximum of 1% at 24 hrs.	ASTM D570
Shore D Hardness	65-75	
Thermal compatibility (mixed with aggregate)	No delamination of overlay	ASTM C884

Note: Values are based on specimens or samples cured or aged and tested at 75°F (24°C).

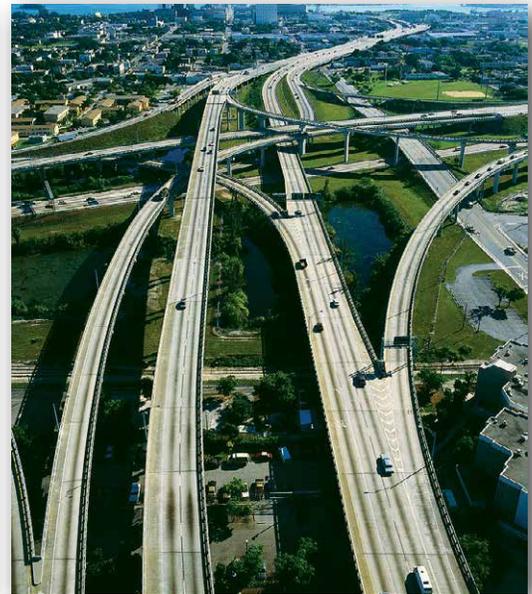
1. Aggregate shall be bauxite and/or flint having less than 0.2% moisture and free of dirt, clay, etc.
2. The bauxite and flint shall have a minimum MOHS scale hardness of 7 unless otherwise approved,

[See online Guide Specifications.](#)



In addition to Bridge Deck Overlay applications, the Type III DOT Epoxy can be used on/applied to the following surfaces:

- | | | |
|---------------------|----------------------------|-----------------------|
| • Horizontal Curves | • Bridge Decks | • Hospital Entrances |
| • Intersections | • On-ramps | • Bike Lanes |
| • Parking Areas | • High Occupancy Lanes | • Bus Lanes |
| • Rural Roadways | • School Zones | • Pedestrian Walkways |
| • Industrial Sites | • Toll Authority Entrances | |



For more information about Bridge Deck Overlay and Pro-Poxy Type III DOT, contact our Bridge Deck Overlay Professionals at 800-821-5846 or [online](#).



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