

MMA Polymer Concrete Overlay System

T-18

T-18 is a methyl methacrylate (MMA) based bridge overlay system in which graded aggregates are bound together in slurry with a polymer binder and broadcast wearing course aggregate for vehicular traffic. T-18 can be applied up to a total thickness of 3/8" thereby extending the life of bridge decks by adding minimal deadweight, increased waterproofing, and high skid resistance characteristics. T-18 possesses a cure time of 2-3 hours at temperatures ranging from 14 °F to 90 °F (-10 °C to 32 °C) thereby reducing closing times for vehicular traffic. T-18 is not intended for use over bituminous-based substrates or steel bridge decks.

Application Procedure

Surface Preparation: All surfaces that are to receive T-18 must be thoroughly clean and free of all dirt, grease, rust, and other contaminants that might interfere with the proper adhesion of the overlay system. All damaged or deteriorated concrete must be removed using jackhammers or any other means and cut back to sound concrete. All surfaces, including those that are patched, must be thoroughly shot-blasted or sandblasted to ICRI concrete surface profile (CSP-5). To verify that the surface preparation is adequate, ACI 503R tensile adhesion tests should be performed.

Priming: Concrete substrates must be dry prior to application of the primer. Priming is done with T-18 Primer using either rollers or brushes at a rate of approximately 100 square feet per gallon. The primer resin is mixed with an appropriate amount of powder hardener as shown in Table 1.

Care should be taken to avoid puddling of the primer. Re-prime any areas that indicate surface absorption of the primer. Dry silica sand (#0 mesh) should be used for a broadcast at the rate of approximately 4 lb/100 ft². The primer coat must be allowed to cure tack-free before application of the T-18 Bridge Overlay System.

Table 1: Mixing Instructions for T-18 Primer

Resin or Substrate Temperature	Number of 30-gm bags of Powder Hardener Per Gallon of Primer Resin
14 °F - 35 °F	6
36 °F - 55 °F	5
56 °F - 75 °F	4
76°F - 90 °F	3

Slurry Application: A standard slurry unit consists of 50 lbs. of T-18 powder component, 2 gallons of T-18 resin component and powder hardener. The amount of hardener required per unit of slurry mix is shown in Table 2.

Slurry can be mixed in 5-gallon pails with a mixing blade or in concrete drum mixers. Mix one unit at a time thoroughly to obtain a slurry consistency. Apply the slurry immediately after mixing by pouring directly onto the primed and cured deck surface. Distribute by means of steel gauge rake to desired thickness.

Table 2: Powder Hardener Mixing Instructions for T-18 Slurry

Slurry Resin or Substrate Temperature	Amount of Powder Hardener Per 2-Gallon of Slurry Resin
14 °F - 35 °F	12
36 °F - 55 °F	8
56 °F - 75 °F	5
76°F - 90 °F	3

Broadcast Aggregate: Broadcast the specified course aggregate onto the fresh, uncured slurry until complete coverage is achieved. Aggregate should be thrown into the air and allowed to “rain” down onto the slurry to avoid rippling. Allow slurry to cure for approximately 1 hour. Remove excess aggregate with brooms, power-sweepers or ride-on parking lot sweepers that collect and recycle aggregates.

Topcoat: T-18 Top Coat is applied to the freshly swept wearing course aggregate using heavy nap rollers at the rate of approximately 40 square feet per gallon. The topcoat should not be allowed to puddle and is meant to simply lock down the aggregate rather than act as an integral film.

Packaging

The standard packaging for Transpo T-18 consists of a powder component, a liquid component and prepackaged powder hardener in the following sizes:

Powder: Available in 50 lb. bags

Liquid:

T-18 Primer	55 Gallon Drum	5 Gallon Pail
Gross Weight (lbs)	437	40
Net Weight (lbs.)	396	36
Nominal Volume (gal.)	48.3	4.42
T-18 Slurry Resin	55 Gallon Drum	5 Gallon Pail
Gross Weight (lbs.)	477	46
Net Weight (lbs.)	440	42
Nominal Volume (gal.)	52.3	5
T-18 Top Coat	55 Gallon Drum	5 Gallon Pail
Gross Weight (lbs.)	478	44
Net Weight (lbs.)	441	40
Nominal Volume (gal.)	54.6	5

Storage

All T-18 components should be stored out of direct sunlight in original, unopened containers in a cool, dry area at temperatures less than 86 °F. Under these conditions, product shelf life is six months from date of receipt.

T-18 resins contain paraffin that is necessary for tack-free curing. After long storage periods, paraffin may migrate to the surface in the form of agglomerates. These must be re-dispersed with a drum mixer to ensure an even distribution in the resin.

Properties*

Property	Value – Unit of Measure	Test
T-18 Primer		
Viscosity	50 - 70 cps (mpa-S)	ASTM D2393
Density	8.16 lbs/gal (0.98 gms/ml)	ASTM D2849
Pot Life (@ 70 °F)	10 - 30 minutes	ASTM C881
Flash Point	>43 °F (>6 °C)	ASTM D1310
Solids Content (w/catalyst)	100%	ASTM D1644
T-18 Slurry Resin		
Viscosity	1100 - 1300 cps (mpa-S)	ASTM D2393
Density	8.41 lbs/gal (1.01 gms/ml)	ASTM D2849
Pot Life (@ 70 °F)	10 - 15 minutes	ASTM C881
Flash Point	>48 °F (>9 °C)	ASTM D1310
Elongation at Break	50 %	ASTM D638
Solids Content (w/catalyst)	100%	ASTM D1644
T-18 Slurry		
Compressive Strength	1500 - 2500 psi (10.3 - 17.2 MPa)	ASTM D695
Flexural Strength	800 - 1200 psi (5.5 – 8.3 MPa)	ASTM D790
Tensile Strength	500 - 800 psi (3.4 – 5.5 MPa)	ASTM C307
Coefficient of Thermal Expansion	$4.4 \times 10^{-5} / ^\circ \text{F}$	ASTM C531
Tensile Adhesion (pull-off concrete)	>250 psi (>1.7 MPa)	ASTM C1583
Water Absorption	0.5 %/24h	ASTM D570
T-18 Top Coat		
Viscosity	200 – 400 cps (mpa-S)	ASTM D2393
Density	8.08 lbs/gal (0.97 gms/ml)	ASTM D2849
Pot Life (@70° F)	8 – 15 minutes	ASTM C881
Flash Point	>50°F (>10° C)	ASTM D1310
Solids Content (w/catalyst)	100%	ASTM D1644

* To be used as general guidelines only

Caution

The uncured liquid component is flammable. All appropriate precautions should be taken. After curing, it will not support combustion. As with any organic peroxide, BPO must be isolated from resins, accelerators, rust, and contaminants of any type.

It is recommended that all persons involved in mixing and application wear protective clothing such as goggles, rubber boots, and rubber gloves. As with all chemicals, read MSDS prior to use.

Warranty

The following warranty is made in lieu of all other warranties, either expressed or implied. This product is manufactured with selected raw materials by skilled technicians. Neither seller nor manufacturer has any knowledge or control concerning the purchaser's use of product and no warranty is made as to the results of any use. The only obligation of either seller or manufacturer shall be to replace any quantity of this product that proves to be defective. Neither seller nor manufacturer assumes any liability for injury, loss, or damage resulting from use of this product.

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