



TuffDeck™ BDM

Spray Applied Deck Waterproofing

1.01 DESCRIPTION

TuffDeck™ BDM Spray-on, seamless, waterproofing membrane for Highway and Railroad Bridge Decks is a fast setting, seamless and joint-free coating system made from a rapid-curing, 100% solids, flexible, aromatic, two component, spray polyurea which can be applied to suitably prepared concrete and metal surfaces. It's extremely fast gel time makes it suitable for applications down to -20°F (-29°C). It may be applied in single or multiple applications without appreciable sagging and is relatively insensitive to moisture and temperature allowing application in most temperatures. It also coats carbon or mild steel metals without primer. Please use the correct product grade that complies with VOC regulations as per federal, state, county and city regulations/codes at the place of installation of product.

1.02 USES

- Airfield & Highway Pavement Repairs
- Bridge Decks And Ramps
- Highway Bridge Abutments
- Parking Structures
- Pedestrian Walkways
- Pier Caps
- Tunnels

1.03 FEATURES

- Accepts Thermal Movement without Crazing
- Applied to 5 MILS (125 microns) Profile Steel Decks w/o Priming
- Certified Applicator Program
- Complies with "Buy America" Requirements
- Excellent Chemical Resistance
- Infrared Spectroscopy Used As Part Of Quality Control During Manufacture
- Installed With Or Without Reinforcement In Transitional Areas
- Interior Or Exterior Applications
- Low Odor
- Low Temperature Flexibility
- Low Vapor Transmission
- Made In America
- Meets Arema Cold Spray-Applied Waterproofing Requirements
- No Toxic Vapors, Odorless
- Non-Hybrid System
- Non-Reactive
- Seamless
- Seamless Lap Joints
- Superior Crack-Bridging
- Thermal Stability
- Zero VOC (100% Solids)

1.04 TECHNICAL DATA

Meets: North American Ballast Test at 80 mils (2032 microns) for 2.0 million cycles.

Exceeds

1.05 PACKAGING

10-gallon kit: 5 gallon (18.9 liters) pail of Side-A and 5-gallon (18.9 liters) pail of Side-B.

100-gallon kit: 50 gallon (189 liters) drum of Side-A and 50-gallon (189 liters) drum of Side-B.

1.06 COLOR

Black or Concrete Gray

Custom colors are available upon request. Minimum quantity applies, contact Poly-Tuff Systems International (PSI).

Due to its aromatic nature, **TuffDeck™ BDM** will tend to yellow or darken in color and will become flat after exposure to UV light. **TuffDeck™ BDM** may be top coated with an aliphatic polyurethane/polyurea coating for a color-fast finish.

1.07 GENERAL

TuffDeck™ BDM is extremely resistant to water vapor transmission and protects against moisture entrapment between **TuffDeck™ BDM** and deck surfaces that could be susceptible to freeze-thaw degradation. It can be applied in extreme cold and elevated temperatures exceeding 170°F (77°C) surpassing the limitation of 104°F (40°C) of both MMA and urethane membranes. **TuffDeck™ BDM** can be used in conjunction with hot asphalt overlays to provide the best possible protection against penetration of saltwater from winter snow and ice prevention activities.

TuffDeck™ BDM Primer will bond with asphalt residue to allow quick installation when time constraints warrant fast turnaround. **TuffDeck™ BDM** is able to resist early loading of ballast and pneumatic tire traffic almost immediately following membrane placement, ensuring fast turnaround and limited delays during construction. It meets and exceeds all requirements of AREMA guidelines for use on all railroad bridges. It can be used in direct contact with rock ballast without the need for protection board, reducing cost and installation time on railroad bridges. Also, unlike many other membrane systems, **TuffDeck™** does not have an objectionable odor that could cause public concerns during installation.

TuffDeck™ BDM outperforms torch-applied, hot mop, pre-form sheets and leading spray-applied products. **TuffDeck™ BDM** is an easily

installed spray on material that forms a tough, seamless-waterproofing membrane for highway and railroad bridge decks. This cold-applied elastomeric barrier provides longer bridge deck lifecycle performance and more ease of application than environmentally harmful non-spray membranes, such as torch-applied and hot mop products. **TuffDeck™ BDM** cost-saving thin coating also outperforms all other types of spray-applied membranes, including MMA. This innovative waterproofing material has been tested to meet or exceed the most stringent DOT and AREMA standards. PolyTuff Systems International, (PSI) evaluates each product batch and offers a spectrograph analysis from these tests for comparison with the spectrograph of the applied material to assure installed product quality. PSI also provides onsite Quality Assurance inspections for the duration of each bridge project.

TuffDeck™ BDM is specifically engineered for use on highway and bridge decks, bridge abutments, pier caps, tunnels and pedestrian walkways. This waterproofing membrane can be used on intermodal and LRT rail bridges with or without protection board, providing fast turnaround for demanding project schedules. **TuffDeck™ BDM** can be used without priming on steel decks having a 5-mil profile allowing the fastest system installation in the industry. **TuffDeck™ BDM's** superior toughness allows for short term rubber-tired construction/vehicular traffic before returning the bridge deck to service.

1.08 PREPARATION

In general, coating performance and adhesion are directly proportional to surface preparation. Most failures in the performance of surface coatings can be attributed to poor surface preparation. Polyurea coatings rely on the structural strength of the substrate to which they are applied. All surfaces must be free of dust, dirt, oil, grease, rust, corrosion and other contaminants. When coating substrates previously used, it is important to consider the possibility of substrate absorption, which may affect the adhesion of the coating system, regardless of the surface preparation. PSI recognizes the potential for unique substrates from one project to another. The following information is for general reference, and for project-specific questions, contact PSI representative.

New and Old Concrete:

Refer to SSPC-SP13/NACE 6, or ICRI 03732: CSP 3-5. New concrete must be cured for 28 days prior to product application. Surface must be clean, dry, sound and offer sufficient profile for product adhesion. Remove all dust, dirt, oil, form release agents, curing compounds, salts, efflorescence, laitance and other foreign matter by shotblasting and/or suitable chemical means, in accordance with local chemical regulations. Rinse thoroughly, to achieve a pH between 8.0 and 11.0. Allow to dry completely. If old concrete has a surface that has deteriorated to an unacceptably rough surface, **TuffDeck™ BDM** or a mixture of Enviro-Grip™ #1 and sand should be used as a repair agent for cracks, spalls, bug holes and voids. Upon full cure of the repair agent, prime the entire surface intended for coating. Concrete Surface Preparation Reference:

ASTM D4258 – Standard practice for cleaning concrete
ASTM D4259 – Standard practice for abrading concrete
ASTM D4260 – Standard practice for etching concrete
ASTM F1869 – Standard test method for measuring moisture vapor emission rate of concrete
ICRI 03732 – Concrete surface preparation

All Other Surfaces:

An adhesion test is recommended prior to starting the project.

1.09 PRIMING

Prime surface as required with **Enviro-Grip™ EP#2(SC), #1** or **PUR#555** at a rate of 1 gallon/300 sqft or 300 sqft/gallon (0.14 liters/sqm). Apply using a brush or phenolic-core roller. This will result in 3 dry mils (76 microns) of coating. Existing urethane coated surfaces should be primed with Enviro-Grip™ PUR#555.

Rough and pinholed concrete surfaces may require more primer. Discovery of these issues is generally revealed in the mock-up. See the Tech-Note Section of the Poly-Tuff website. Do not allow primer to puddle, dry roll excess primer with a dry nap roller to pick up excess primer in puddles and overlaps.

1.10 JOINTS, CRACKS, AND FLASHING

Apply **TuffDeck™ BDM** over all primed joints and cracks. Bridge the joints and cracks with 4" (10.16 cm) **Super Seal Polyester Tape**. Do not prime over **Super Seal Tape**. Over reinforcement tape apply a thin coat of **TuffDeck™ BDM** and smooth onto adjacent surface. Optionally in lieu of 3 coursing laps and joints, **Super Seal Tape** may be used over all cleaned laps, joints and cracks and then coated. Fully reinforced systems do not require the use of **Super Seal Tape** over joints and cracks.

1.11 MIXING

TuffDeck™ BDM may not be diluted under any circumstances. Use appropriate solvent for solvent purge line and flushing of equipment and if spraying stops for periods exceeding the pot life of the material. Thoroughly mix **TuffDeck™ BDM** Side-B Base material with air driven power equipment until a homogeneous mixture and color is obtained. **TuffDeck™ BDM** is spray-applied using suitable plural spray equipment at a 1:1 mix ratio.

1.12 APPLICATION

TuffDeck™ BDM should be applied using a 1:1 plural component equipment capable of developing a minimum of 2000 psi and heating the individual component to 170°F (77°C) using an impingement gun. It is applied over the primer at a nominal 80 mils (2032 microns). Application of a second subsequent 30 to 40 mil (762- 1016 microns) layer of membrane of primer shall be applied on highway bridge decks that have been determined to require an aggregate broadcast for shear-key purposes.

Hose temperature should be maintained at 160-170°F (71-77°C). The **TuffDeck™ BDM** material should be preheated to 75- 85°F (24-30°C).

TuffDeck™ BDM should be sprayed in multi directional passes for a proper uniform thickness.

Recoat Time	0-6 hours
Recommended Applied Thickness	> 2 mm
Return to Service: Foot Traffic	1 - 4 hours
Return to Service: Full Service	> 24 hours

1.14 CLEAN UP

Equipment should be cleaned with an environmentally safe, urethane grade solvent (alcohol free) as permitted under local regulations immediately after use.

TECHNICAL DATA (Based on draw down films)	
Ballast Test N. American, 2,000,000 cycles	4 - 8 sec
Electrical Resistance, ASTM D257	1.5 x 10 ¹⁴ +ohmcm
Chemical Resistance, ASTM D543 Glycol, Calcium Chloride, Method B, Diesel and Gas	Pass
Shore D Elongation ASTM D638	250%
Water Vapor Transmission ASTM E96	< 0.2 perms Proce- dures A and B
Tear Strength, pli, Die C ASTM D624	450 pli
Specific gravity at 77° F (25°C)	1.02
Penetration at 77° F (25°C) ASTM D5	15-40
Weight per gallon at 60°F (15°C)	8.5 lbs
Flash Point, C.O.C.	550°F min (287.7°C)
Odor	Tar
(*These physical properties from sample sprayed with Graco Foam Cat 200 @ 2000 psi minimum, with Gusmer GX7-400 mechanical purge gun @ 150-160°F (65-71°C). Different machine and parameter will change these properties. User should perform their own independent testing as prop- erties are approximate.)	
*Membrane system shall not be exposed to traffic for more than 7 days or as allowed by the product manufacturer.	

1.15 STORAGE AND SHELF LIFE

TuffDeck™ BDM has a shelf life of 12 months from date of manufacture in original, factory-sealed containers when stored indoors at a temperature between 60-95°F (15-35°C).

Avoid freezing temperatures. Store drums on wooden pallets to avoid direct contact with the ground. If stored for a long period of time, rotate Side-A and Side-B drums regularly.

1.16 LIMITATIONS

- Containers that have been opened must be used as soon as possible.
- Do not dilute **TuffDeck™ BDM**.
- Mix no more material than can be used with 20 minutes.
- Not UV stable.
- **TuffDeck™ BDM** is difficult to clean up after it has cured.
- Surfaces must be dry, clean, and free of foreign matter.

TECHNICAL DATA (Based on draw down films)	
Pot Life at 150°F (66.5°C)	4 - 8 sec
Tack Free Time (thickness & substrate tempera- ture dependent)	45 - 60 sec
Bond to TuffDeck™ BDM, ASTM D4541	500 psi+
Adhesion to Steel, ASTM D4541	>300 psi
Adhesion to Concrete ASTM D7234 and D4541, unprimed	150 psi
Adhesion to Concrete ASTM D7234 and D4541, primed	>200 psi
Viscosity at 150-160°F (66.5-71°C)	Side-A/Side-B: 50 ± 20 cps
Density (Side A & B Combined)	8.81 lbs/gal
Flash Point	> 200°F (93.3°C)
Tensile Strength, ASTM D-412*	3500 ± 200 psi (24.1 ± 1.4 MPa)
Volatile Organic Compounds, ASTM D-2369-81	0.0 lbs/gal (0 gm/liter)
Hardness, ASTM D-2240 Shore D	50 ± 5
Elongation, ASTM D-412*	450 ± 50%
Tear Resistance, ASTM D-412*	450 ±50 pli (78.8 ±8.8 kN/m)
Service Temperature - Dry	-40°F to 250°F (-40 to 121.1°C)
Service Temperature - Wet	40°F to 120°F (4.4 to 48.9°C)
Water Vapor Permeability, ASTM E-96	0.361 perm-inch
Taber Abrasion Resistance, ASTM D4060 (H 18/1000 cycles)	125 mg loss
Crack Bridging, C1305 (Minimum 80 mils at 40 cycles at -15°F [26°C] with 1/8" [0.32 cm] opening)	Pass
Impact Resistance @ 73°F (25°C) (ASTM G14)	> 200 lbs
Pull-Off Strength (minimum), ASTM D4541:Inter-Coat Adhesion (within recoat time)	Excellent
Concrete (Shotblasted profile), substrate failure occurred	>500 psi (3.4 MPa)
Concrete (Primed), substrate failure occurred	>500 psi (3.4 MPa)
Steel (90 um blast profile)	>900 psi (6.2 MPa)
Lineal Shrinkage	1 - 2%
Flexibility (1/8" [3mm] Mendrel Bend Test), ASTM D1737	Pass
Resistance to Weathering, ASTM G-23 (Type QUV Weatherometer-3000 hrs exposure)	No cracking or blister- ing. Color change, gloss reduction & chalking are noted.

WARNING: This product contains epoxy resin and curatives.

1.17 CAUTION

READ SDS PRIOR TO USING PRODUCT

Use with adequate ventilation. Wear protective clothing, gloves, and eye protection. (Goggles, Safety Glasses and/or Face Shield) Keep out of the reach of children. Do not take internally. In case of ingestion, seek medical help immediately. May cause skin irritation upon contact, especially if prolonged or repeated exposure. If skin contact occurs, wash immediately with soap and water and seek medical help as needed. If eye contact occurs, flush immediately with clean water and seek medical help as needed. Dispose of waste material in accordance with federal, state and local requirements. Cured resins are Innocuous. Dispose of waste material in accordance with federal, state and local requirements.

Please read all information in the General & Safety Guidelines, Technical Data Sheets, Guide Specifications and Safety Data Sheets (SDS) before applying material. PSI Products are for "Professional Use Only" and preferably applied by professionals who have prior experience with the PSI Products or have undergone training in application of PSI Products. Published technical data and instructions are subject to change without notice. Contact your local PSI representative or visit our website for current technical data, instructions, and project specific recommendations.

LIMITED WARRANTY

PSI warrants its products to be free of manufacturing defects and that they will meet PSI current published physical and chemical properties. Seller's sole responsibility shall be to replace that portion of the product which proves to be defective. There are no other warranties by PSI of any nature whatsoever expressed or implied, including any warranty of merchantability or fitness for a particular purpose in connection with this product. PSI shall not be liable for damages of any sort, including remote or consequential damages resulting from any claimed breach of any warranty whether expressed or implied. PSI shall not be responsible for use of this product in a manner to infringe on any patent held by others. In addition, no warranty or guarantee is being issued with respect to appearance, color, fading, chalking, staining, shrinkage, peeling, normal wear and tear or improper application by the applicator. Damage caused by abuse, neglect and lack of proper maintenance, acts of nature and/or physical movement of the substrate or structural defects are also excluded from the limited warranty. PSI reserves the right to conduct performance tests on any material claimed to be defective prior to any repairs by owner, general contractor, or applicator.

DISCLAIMER

All guidelines, recommendations, statements, and technical data contained herein are based on information and tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty, either expressed or implied. It is the user's responsibility to satisfy himself, by his own information and test, to determine suitability of the product for his own intended use, application and job situation and user assumes all risk and liability resulting from his use of the product. We do not suggest or guarantee that any hazard listed herein are the only ones which may exist. Neither seller nor manufacturer shall be liable to the buyer or any third person for any injury, loss or damage directly or indirectly resulting from use of, or inability to use, the product. Recommendations or statements, whether in writing or oral, other than those contained herein shall not be binding upon the manufacturer, unless in writing and signed by a corporate officer of the manufacturer. Technical and application information is provided for the purpose of establishing a general profile of the material and proper application procedures. Test performance results were obtained in a controlled environment and PSI makes no claim that these tests or any other tests, accurately represent all environments.