Vulkem® EWS with PUMA Technology (Helipad)

A Waterproof & Wear Resistant Traffic Coating System for Helipads
Ready for use 1 hour after application

DESCRIPTION

Vulkem Extreme Wearing System (EWS) is a waterproof, wear, impact & abrasion resistant, helipad deck coating system that utilises polyurethane-methacrylate (PUMA) technology. Vulkem EWS with PUMA Technology is designed to have tenacious adhesion and extreme abrasion resistance. It can be returned to use in one hour after the final coating is installed, which will minimise operation disruption. Vulkem EWS is composed of:

- Tremco PUMA Primer
- Tremco PUMA BC - Waterproofing Base Coat
- Tremco PUMA WC - Slip Resistant Wear Coat
- Tremco PUMA TC - UV Stable slip Top Coat

BASIC USES

Vulkem EWS is a cold-applied traffic deck coating system designed for waterproofing concrete slabs and protecting occupied areas underneath from water damage. Additionally, the system will protect the concrete from the damaging effects of chloride, deicing salts, chemicals, petrol, oils and anti-freeze. The Helipad System is an optimal solution for new construction and existing helipad platforms.

FEATURES AND BENEFITS

- Polyurethane-methacrylate (PUMA) technology delivers extreme durability while maintaining its crack-bridging characteristics.
- Rapid set-up times allow for quick overall installation, as well as the ability to open up to traffic one hour later.
- Can be applied at temperatures below -6°C, which allows for continuation of projects in the colder months.
- Initiator adjustments allow for 30 to 45 minutes cure time between applications, even at temperatures below freezing.
- Compatible with Tremco sealants and coatings, which is essential for tie-ins, detailing and penetrations.
- Extremely forgiving application allows users to apply additional coats long after the previous coat has cured.
- Unique chemistry allows for easy repair.
- Satisfies the VOC limitations for Green Star performance coatings

PACKAGING

Tremco PUMA Primer: 20kg pails
Tremco PUMA BC: 25kg pails
Tremco PUMA WC: 20kg pails
Tremco PUMA TC: 20kg pails
Tremco PUMA Initiator: 25kg pails
Tremco PUMA Filler Powder: 25kg pails
Tremco PUMA Cleaner: 10kg pails

COLOURS

Standard Stock: Slate Grey
Made to Order: Colours and Clear with minimum order and lead times apply

STORAGE & SHELF LIFE

Store in original, undamaged packaging in a clean, cool, dry and protected location. Shelf life is for **12 months** when stored as recommended in original, unopened packaging.

LIMITATIONS

- Use with adequate ventilation.
- Do not apply to damp or contaminated surfaces.

PROPERTY	TEST METHOD	VULKEM PUMA BC (ALL GRADES)	VULKEM PUMA WC	VULKEM PUMA TC
VOC Content	Method 310	0 g/L	0 g/L	0 g/L
% Solids (by weight)	ASTM D1353	100%	100%	100%
Drying Time @ 23°C, 50% RH*	ASTM D1640	2mm film, 1 hour	1.6mm film, 1 hour	1.27mm film, 1 hour
Elongation	ASTM D638	407%-420%	250%	130%
Weathering	ASTM D822 Weatherometer 350 hr	N/A	N/A	No Effect
Tensile Strength	ASTM D638 @ 23°C	6.8 - 11.6 MPa	10.7 MPa	6.8 MPa
Tearing Resistance	ASTM D4073	4.04 MPa	6.58 MPa	9.03 MPa
Hardness (Shore D)	ASTM D2240	18 - 35	45	55
Hardness (Shore A)	ASTM D2240	65 - 87	96	100
Abrasion Resistance (1,000 Cycles)	ASTM D4060	N/A	N/A	51 mg
Low Temperature Crack Bridging	ASTM C1305	Passes	N/A	N/A
Peak Load @ 22.7°C, avg.	ASTM D5147	>0.48 MPa	0.56 MPa	1.65 MPa
Puncture Resistance	ASTM D5602	>25.4 kg	>25.4 kg	>25.4 kg
Water Vapour Transmission	ASTM E96	1.71 Ng/s m^2 Pa	1.71 Ng/s m^2 Pa	1.71 Ng/s m^2 Pa
Adhesion-in-Peel	ASTM C794	Concrete Failure with Primer	15.9 kg	N/A
Self-Ignition Temperatures (°C)	ASTM D1929	427°C	449°C	454°C

**Drying times will vary depending on ambient temperature and relative humidity*

SURFACE PREPARATION (CONCRETE)

1. Concrete shall be water-cured and attain a 27 MPa minimum compressive strength. Moisture content in the concrete must be lower than 6% as measured using a Tramex CME 4 Moisture Meter. Excess moisture in the concrete can prevent the coating materials from performing as intended. Depending on concrete construction and job site location, additional concrete testing may be required. Please contact your local Tremco Representative.
2. Concrete shall be free of laitance which may inhibit sufficient adhesion. Due to the significant adhesive bond of the Tremco PUMA primer all concrete surfaces must be shotblast to a minimum CSP3 prior to any coating application. For proper methods, refer to ICRI's Technical Guideline No. 03732.
3. Concrete surface shall be properly cleaned so that the surface to receive the coating, sealant, or liquid applied flashing is free of any laitance, mould, paint, sealers, coatings, curing agents, loose particles, and other contamination or foreign matter which may interfere with the adhesion.
4. Shrinkage cracks in the concrete surface which are 1.6 mm wide or greater shall be treated according to the instructions in "Detail Work".
5. Structural cracks, regardless of width, shall be ground out to a minimum 6mm x 6mm deep and treated according to the instructions in "Detail Work".
6. Spalled areas shall be square cut to profile a neat geometry, cleaned and free of loose contaminants prior to repair. Because jobsite conditions vary, it is recommended that you contact your local Tremco Representative. Depending on the substrate and depth of the spalled area, a TREMcrete concrete repair product will be recommended as the best method of repair.
7. In the event of exposed reinforcing steel, it is recommended that the structural engineer of record be contacted for investigation of the condition and work with Tremco for the best method of repair.
8. Surfaces shall be made free of defects that may telegraph and show through the finished coating. Surfaces which are rough (fins, ridges, exposed aggregate, honeycombs, deep broom finish, etc.) shall be levelled and made smooth by applying the appropriate TREMcrete concrete repair product or a coat of sand-filled Tremco PUMA WC according to the instructions in "Detail Work."
9. All drains shall be cleaned and operative. Drains shall be recessed lower than the deck surface. Surface shall be sloped to drain and provide positive drainage. Drains should be detailed as instructed below:
    - Cut a 6mm wide x 6mm deep rebate into the concrete surface at any point where the coating will have an exposed terminating edge- that is, any point where the coating will end in an open area subject to traffic, for example, at the end of a ramp, around drains and alongside expansion joints.
10. If the project is a restoration deck, old sealant and backing material shall be removed. The joint interface should exhibit a smooth surface that is profiled in a 2:1 width:depth ratio and will require a thorough wire brushing, grinding, sandblasting, and primer.
11. Cut termination reglets into concrete dock around the perimeter of the area to be coated with Vulkem EWS

CONDITIONS FOR METAL SURFACES

All surfaces shall be sand-blasted to meet the requirements of AS1627.4, class 2.5 for "Near White Metal".

JOBSITE MATERIALS

Recommended materials and their use are as follows:

1. Tremco PUMA Primer: A one component, chemical-curing MMA primer for porous and non-porous surfaces.
2. Tremco PUMA BC: A one component, chemical-curing PUMA modified coating used as an elastomeric, waterproofing membrane for Vulkem EWS.
3. Tremco PUMA WC: A two-part, chemical-curing PUMA modified wearing course that can also be used with sand to level out uneven areas in the concrete.
4. Tremco PUMA TC: A one component, chemical-curing MMA coating used to lock in aggregate and provide additional chemical and UV resistance to Vulkem EWS.
5. Tremco PUMA Cleaner: A one-part PUMA cleaner for all tools such as mixing paddles, squeegees, spiked rollers and spatulas. Always use this cleaner for Vulkem EWS materials. Never use any kind of solvent to clean any of your tools as this will cause contamination and inhibit cure.
6. Tremco PUMA Initiator: A benzoyl peroxide-based initiator used to initiate setting of all components of Vulkem EWS.
7. Tremco PUMA Filler: A calcium carbonate filler used to thicken PUMA resins
8. Aggregate: 30-50 mesh-sized silica sand for the primer application. 1-3mm heavy duty aggregate comprised of Bauxite/Aluminum Oxide, which imparts a textured surface and contributes to wear resistance.

USAGE GUIDE

TABLE 1: QUICK REFERENCE APPLICATION CHART FOR HELIPADS

Product	Coverage Rate (kg/m^2)	Thickness	
		WFT	DFT
Tremco PUMA Primer	0.40	0.4mm	0.4mm
Tremco PUMA BC	2.00	1.5mm	1.5mm
Tremco PUMA WC + Filler Powder	2.00 3.00	±3.0mm	±3.0mm
Bauxite or Quartz (2-3mm) Broadcast	3 - 4	N/A	N/A
Tremco PUMA TC	0.6	0.6mm	0.6mm

NOTE:

1. Dependent on client requirements, surface texture may be smooth or non-slip. If smooth, omit aggregate broadcast but seal with Tremco PUMA TC @ 0.5 kg/m^2.
2. Between each successive coat, excessive aggregate must be vacuumed off for re-use.
3. Coverage of the sysem may vary according to requirements.
4. Tremco PUMA BC will fill cracks and control joints when applied at the recommended thickness noted in Base Coat Application section. Please note, Tremco PUMA BC is not for use in the application of expansion joints. For expansion joints see "Detail work- Expansion Joints Dymonic 100"

PRIMING CONCRETE SURFACES

1. Mix Tremco PUMA Primer for 1 to 2 minutes prior to the addition of Tremco PUMA Initiator.
2. Mix Tremco PUMA Primer thoroughly together with Tremco PUMA Initiator in accordance with Table 3 for 2 to 3 minutes.

3. Apply Tremco PUMA Primer at a minimum of 0.4 kg/m² to the entire area to be coated. The recommended method of application is with a roller. NOTE: For porous substrates, an additional coat my be required.
4. Once primer is rolled out evenly, lightly broadcast 0.3 - 0.7mm sized silica sand into the primer at a rate of 0.3kg/m².
5. Allow Tremco PUMA Primer a minimum of 30 min to fully cure.

DETAIL WORK

DEFECTS, PATCHING AND SLOPING

1. Mix Tremco PUMA WC for 1 to 2 minutes prior to the addition of the silica sand.
2. Begin with 1kg of sand for every 1kg of Tremco PUMA WC. Additional sand can be added if a thicker consistency is desired.
3. Once Tremco PUMA WC and the sand are blended together, combine this mixture with the Tremco PUMA Initiator in accordance with Table 2 and mix thoroughly for 2 to 3 minutes. Amount of Tremco PUMA Initiator is dependent on ambient temperature.
   NOTE: The Tremco PUMA Initiator addition is based on the ratio of Initiator to Tremco PUMA WC, not Initiator to Tremco PUMA WC with silica sand. Please see Table 2 for addition amounts.
4. For uneven spots and other defects in the surface, such as pitting or cratering, a thicker mix of Tremco PUMA WC and sand may be required. Trowel the material to create an even surface with the concrete.
5. Allow Tremco PUMA WC with sand mixture to cure a minimum of 45 minutes before proceeding to base coat application.

OPTION 1 HORIZONTAL TO VERTICAL TRANSITION
(Vulkem EWS Products)

1. Mix the Tremco PUMA BC for 2 to 3 minutes prior to the addition of the Tremco PUMA Initiator. Ensure that Tremco PUMA BC is thoroughly mixed together with the Tremco PUMA Initiator in accordance with Table 2 for 2 to 3 minutes.
2. Apply a fillet of Tremco PUMA BC 25mm wide at the juncture of all horizontal and vertical surfaces (such as hobs, wall sections, columns or penetrations through the deck). Tool Tremco PUMA BC to form a 45° fillet. Use sufficient pressure to force out any trapped air and to assure complete wetting of the surface. Remove excess material from the deck or wall surface.
3. Apply a strip of tape (masking tape or duct tape) to the vertical sections, 50 to 75mm above the Tremco PUMA BC fillet to provide a neat termination of Tremco PUMA BC.
4. Apply Tremco PUMA Primer over the Tremco PUMA BC fillet before applying coating.

OPTION 2- HORIZONTAL TO VERTICAL TRANSITION (DYMONIC 100)

NOTE: Do not apply sealant to a frosty, damp or wet surface or when substrate temperature is below 4°C or the surface temperature is above 43°C . Cure times as stated on the relevant Product Data Sheet are based upon standard ambient conditions of 25°C, 50% RH. A decrease in ambient temperature and humidity will significantly lengthen the cure time. It is suggested to install Dymonic 100 prior to PUMA Primer installation

1. Lay a 6 mm diameter backing rod into the corner at the junction of all horizontal and vertical surfaces such as curbs, wall sections, columns or penetrations through the deck.
2. Apply a bead of Dymonic 100 25mm wide over the backing rod.
3. Tool the Dymonic 100 sealant bead to form a 45°cant. Use sufficient pressure to force out any trapped air and to ensure complete wetting of the surface. Remove excess sealant from the deck or wall joint.
4. Allow the sealant to fully cure prior to overcoating.
5. Apply Tremco PUMA Primer over the fully cured Dymonic 100 fillet before applying coating.

NOTE: Backing rod is only required for moving joints.

EXPANSION JOINTS (DYMONIC 100)

The Vulkem EWS system should be turned into the face of the expansion joint, which can then be subsequently sealed with Dymonic 100 following the methodology below.

NOTE: Do not apply sealant to a frosty, damp or wet surface or when substrate temperature is below 4°C or the surface temperature is above 43°C. Cure times as stated below are based upon standard ambient conditions of 23°C, 50% RH. A decrease in ambient temperature and humidity will significantly lengthen the cure time.

1. Install an appropriate closed cell backing rod to all expansion joints. Set depth of backer rod to control the depth of the sealant. (Depth of sealant is measured from the top of the backer rod to the top of the concrete surface.) Proper depth of sealant is as follows:
   - The minimum joint size is 6mm x 6mm.
   - For joints 6mm to 12mm wide, the depth to width ratio should be equal.
   - Joints 12mm wide or greater, the depth to width ratio should be 1:2
2. All expansion joints shall be sealed with Dymonic 100, and tooled flush with the surface. Note: Expansion joints should not be coated over.
3. Allow sealant to fully cure.

BASE COAT APPLICATION

1. Mix Tremco PUMA BC for 1 to 2 minutes prior to the addition of Tremco PUMA Initiator. NOTE: for ramps up to a 40% slope, mix Tremco PUMA BC for 2 to 3 minutes before adding Tremco PUMA Initiator.
2. Ensure Tremco PUMA BC is thoroughly mixed together with the Tremco PUMA Initiator in accordance with Table 2 for 2 to 3 minutes. Amount of Tremco PUMA Initiator is dependent on the ambient temperature. Please see Table 3 for addition amounts.
3. Apply Tremco PUMA BC at 2.0kg/m² to yield 1.5 wet mm thick to the entire area. The recommended method is a metal serrated rake or trowel.
4. Spike roll Tremco PUMA BC immediately to release all air bubbles from the coating.
5. Allow Tremco PUMA BC a minimum of 45 minutes to cure.

THIXOTROPIC BASE COAT (Vertical Applications)

Where a thixotropic base coat is required, for example at upturns and vertical applications. Tremco Thix Powder can be added to the Tremco PUMA BC.

1. Mix Tremco PUMA BC for 1 to 2 minutes, prior to the addition of Tremco Thix Powder.
2. Tremco Thix Powder can then be added at rate starting at 1% (by weight), to a maximum of 3% by weight, that is a maximum of 600g of Tremco Thix Powder per pail of Tremco PUMA BC.
3. Once Tremco PUMA BC and Tremco Thix powder are blended together, add Tremco PUMA Initiator in accordance with Table 3, mix for 2 to 3 minutes. NOTE: The amount of PUMA Initiator is based on the ratio of Initiator to Tremco PUMA BC, not Initiator to Tremco PUMA BC with Thix Powder.
4. Ensure Tremco PUMA BC is thoroughly mixed together with the Tremco PUMA Initiator in accordance with Table 3 for 2 to 3 minutes. Amount of Tremco PUMA Initiator is dependent on the ambient temperature. Please see Table 2 for addition amounts.

5. Apply Tremco PUMA BC thixotropic to obtain 2.0 wet mm thick to the entire area. Spiked rollers are not required for vertical sections.
6. Allow Tremco PUMA BC a minimum of 45 minutes to cure.

WEAR COAT APPLICATION

1. Mix Tremco PUMA WC for 1 to 2 minutes prior to the addition of Tremco PUMA Filler Powder.
2. 1.5kg of Tremco PUMA Filler Powder is used for every 1kg of Tremco PUMA WC. Once Tremco PUMA Filler Powder is added, mix for 2 to 4 minutes.
3. Once Tremco PUMA WC and Tremco PUMA Filler Powder are blended, this mixture is thoroughly mixed together with the Tremco PUMA Initiator in accordance with Table 2 for 2 to 3 minutes.
   NOTE: The Tremco PUMA Initiator addition is based on the ratio of Initiator to Tremco PUMA WC, not Initiator to Tremco PUMA WC with Tremco PUMA Filler Powder. Please see Table 2 for addition amounts.
4. Apply mixed Tremco PUMA WC with Tremco PUMA Filler Powder mixture at 5kg/m^2 to yield ±3.0 wet mm thick to the entire area. The recommended method is a metal serrated rake.
5. Spike roll Tremco PUMA WC immediately to release all air bubbles from the coating.
6. Immediately following the application of the Tremco PUMA WC, broadcast to refusal (flood coat) the material with 2-3mm sized Bauxite at approximately 3.0-4.0 kg/m^2.
7. Allow Tremco PUMA WC a minimum of 45 minutes to cure. Before proceeding with the Tremco PUMA TC, sweep or blow off any excess sand or colour quartz.

TOP COAT APPLICATION

1. Mix Tremco PUMA TC for 1 to 2 minutes prior to the addition of Tremco PUMA Initiator.
2. Ensure Tremco PUMA TC is thoroughly mixed together with the Tremco PUMA Initiator in accordance with Table 3 for 2 to 3 minutes. Amount of Tremco PUMA Initiator is dependent on the ambient temperature.
3. Apply first Tremco PUMA TC at 0.6 kg/m^2 to the entire area. The recommended method of application is with a soft squeegee and roller.
4. Allow Tremco PUMA TC a minimum of 1 hour to cure before opening.

CLEAN UP

Clean all adjacent areas to remove any stains or spills with Tremco PUMA Cleaner.

Clean tools or equipment with Tremco PUMA Cleaner.

Clean hands by soaking in hot, soapy water then brush with a stiff bristle brush.

TROUBLESHOOTING

This section describes common industry application issues when certain environmental conditions exist. Below are some commonly seen issues and remedies. If any of these should occur, it is always recommended you contact your local Tremco Representative.

Tremco requires that any possible recoating job be reviewed and approved by your Tremco Representative prior to installation.

When a deck contains too much moisture, the excess moisture may change into a vapour which then condenses at the concrete-membrane interface before the coating has cured, which will cause blisters or bubbles, which, in turn, will interfere with proper adhesion. If this should occur the blisters/bubbles can be cut out, allowing the moisture to escape. After moisture has escaped and the surface is dry, the area can be repaired.

If the coating is applied in very hot ambient temperatures, the air in the small spaces between the concrete particles increases in volume and forms blisters. Contact Tremco should this occur

Tremco PUMA products should only be applied when the substrate temperatures are less than 46°C

HEALTH & SAFETY PRECAUTIONS

The Safety Data Sheet (SDS) must be read and understood prior to use.

TECHNICAL SERVICE

TREMCO has a team of Representatives who provide assistance in the selection and specification of products. For more detailed information or service and advice, contact your local representative.

GUARANTEE/WARRANTY

TREMCO products are manufactured to rigid standards of quality. Any product which has been applied (a) in accordance with TREMCO written instructions and (b) in any application recommended by TREMCO, but which is proved to be defective, will be replaced free of charge.

Any information provided by TREMCO in this document in relation to TREMCO's goods or their use is given in good faith and is believed by TREMCO to be appropriate and reliable. However, the information is provided as a guide only, as the actual use and application will vary with application conditions which are beyond our control. TREMCO makes no representation, guarantee or warranty relating to the accuracy or reliability of the information and assumes no obligation or liability in connection with the information. To the extent permitted by law, all warranties, expressed or implied are excluded.

TABLE 2: TEMPERATURE CHART

Temperature (°C)	Initiator % Addition by Weight of Resin
20 to 35	3%
10 to 20	4%
0 to 10	8%
-10 to 0	10%