

## PRODUCT DESCRIPTION

Vulkem 350/346 is a composite waterproofing system comprised of tough-curing liquid polyurethane. It cures to form a durable rubber membrane surface that provides a lasting and easy-to-clean waterproof and trafficable coating. Textured surfaces for pedestrian traffic will use an aggregate-laden top membrane to aid in wear and slip resistance. Vulkem 350/346 may be used to apply a seamless, monolithic waterproof membrane to concrete and primed metal surfaces.

## USAGE/PURPOSE

Vulkem 350/346 is ideal for pedestrian and waterproofing areas such as:

- Podiums
- Recreation Decks
- Balconies
- Mechanical Rooms
- Stadiums
- Athletic Surfaces
- Roofs
- Similar applications that require an elastomeric, traffic grade waterproofing system.

## PACKAGING & COLOUR

Vulkem 350R/SL Basecoat (18.9L Pails)

- Grey

Vulkem 346 Wearcoat (18.9L Pails)

- Grey
- Slate Grey
- Special colours are available upon request.



## FEATURES & BENEFITS

- Tested to AS4654.1 to ensure compliance with the BCA for external waterproofing in Australia.
- Single component products provide efficient use of material for small areas.
- Fast cure through time allows the area to be returned to use 24 hour after installation in most instances.
- Mildew and fungus resistance safeguards concrete surfaces against environmental contaminants.
- Excellent durability and UV resistance extends the useful life of pedestrian systems.
- Re-coatable and compatible with other Tremco sealants, which enhance waterproofing protection with full system compatibility.

## TYPICAL PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	Vulkem 350	Vulkem 346
Drying Time @ 23°C - 50% RH	ASTM D1640	12 hours	6 - 8 hours
Weathering	ASTM D822	N/A	No Effect
Salt Spray Resistance	ASTM B117	N/A	No Effect
Accelerated Aging	ASTM D573	No loss of elongation or tensile strength	No loss of elongation or tensile strength
Hardness (Shore A)	ASTM D2240	60	85 - 95
Abrasion Resistance (1,000 cycles)	ASTM D573	N/A	50mg - Pass
Bond Strength	ASTM C794	Concrete Masonry - 42 N Plywood - 146 N	Concrete Masonry - 42 N Plywood - 146 N
Cyclic Movement	CSIRO Moving Joint Test	Pass	Pass
Elongation at Break	AS4654.1 Appendix A	409%	210%
Elongation	ASTM D412	1040%	120%
Heat Ageing	AS/NZ S4858	2.87 MPa, 311% Elongation	20.80 MPa, 210% Elongation
Temperature Resistance	AS4654.1 Clause 2.6	Pass	Pass
Ultraviolet Resistance	AS4654.1 Table A4	N/A - Non Exposed	18.99 MPa, 207%
Tensile Strength	AS4654.1 Table A4	1.85 MPa	21.95 MPa, 210%
Tensile Strength	ASTM D412	2.21 MPa	19.31 MPa
Durability	AS4654.1 Table A4	Pass	Pass
Water Vapour Transmission Rate	ASTM E96	17.8 g/m <sup>2</sup> /24hours	26.0 g/m <sup>2</sup> /24hours

**SHELF LIFE**

12 months when stored as recommended in original unopened packaging.

**STORAGE**

Store in original, undamaged packaging in a clean, dry, protected location.

**LIMITATIONS**

- ❑ Use with adequate ventilation.
- ❑ Do not apply to damp or contaminated surfaces.
- ❑ Not suitable for vehicular or heavy equipment use.

**SUBSTRATE PREPARATION FOR CONCRETE SURFACES**

1. Concrete shall be water-cured and attain a 20 MPa minimum compressive strength. Moisture content in the concrete must be lower than 4.5% as measured using a Tramex CME 4 Moisture Meter. 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 any laitance which may inhibit sufficient adhesion. Removal of laitance can be achieved through a variety of physical abrasion methods, such as, shotblasting (preferred method) sandblasting or grinding.
3. Concrete surface shall be properly cleaned so that the surface to receive the coating, sealant or liquid-applied flashing is free of mould, paint, sealers, coatings, curing agents, loose particles, and other contamination or foreign matter that may interfere with the adhesion.
4. Shrinkage cracks in the concrete surface that are 1.6mm wide or greater shall be ground out to a minimum 6mm wide x 12mm deep and treated according to the instructions in "Detail Work" section.
5. Structural cracks regardless of width shall be ground out to a minimum 6mm wide x 12mm deep and treated according to the instructions in "Detail Work" section.
6. Spalled areas shall be cleaned 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 areas, a TREMCrete 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 and for best repair method.
8. Surfaces shall be made free of defects that may telegraph and show through the finished coating. Surfaces that are rough (fins, ridges, exposed aggregate, honeycombs, deep broom finish, etc.) shall be levelled and made smooth by applying a coat of sand-filled epoxy using TREMcoat MPE.
9. All drains shall be cleaned and operative. Drains shall be recessed lower than the deck surface. The surface shall be sloped to drain to provide positive drainage (1:100) as per AS4654.2. Drains should be detailed as instructed below:
  - Cut a 6mm wide x 12mm deep keyway 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 membrane material shall be removed. The joint interface will require a thorough wire brushing, grinding, sandblasting, solvent washing and/or primer.

**SUBSTRATE PREPARATION FOR METAL SURFACES**

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

**JOBSITE MATERIALS**

Recommended materials and their uses are as follows:

- ❑ TREMproof 200EC Primer: A low-VOC, two-part, water based epoxy primer for use on porous substrates, such as wood and concrete to provide a vapour retarder. Also can be used on concrete based substrates to provide an efflorescence barrier.
- ❑ Vulkem 171 Primer: A one-part, film-forming primer to be used on porous surfaces.
- ❑ Vulkem 191 QD Primer: A low-VOC compliant, one-part, interlaminar primer for use in applying a fresh coat of Vulkem coating or sealant after preceding coat has been exposed to rain or for periods of time greater than 24 hours.
- ❑ TREMprime Multi-Surface Urethane Primer: A low-VOC, rapid drying, two-part primer for use between urethane coatings or on porous substrates such as, wood and concrete.
- ❑ TREMprime Non-Porous Primer: A low-VOC primer for use in applying urethanes to non-porous substrates such as metal, PVC and glass.
- ❑ Dymonic 100: A one-part, exceptional movement (+100/-50%) moisture-curing, gun grade polyurethane sealant for use in precast, masonry, expansion joints, control joints and for use in forming cant/fillet bead.
- ❑ TREMflex 50: A one-part, high movement (+/-50%) moisture-curing, gun grade polyurethane sealant for use in precast, masonry, control joints and for use in forming cant/fillet bead.
- ❑ Vulkem 350R/SL Base Coat: A one-part urethane waterproofing membrane. It retains its integrity even if substrate movement causes hair-line cracks of up to 1.5mm. If cut or damaged, Vulkem 350R/SL is easy to repair compared to other trafficable waterproofing systems. Vulkem 350 will prevent water migration between the membrane and the substrate. Vulkem 350 is available in either a R (roller) grade or SL (self-levelling) for vertical and horizontal applications respectively.
- ❑ Vulkem 346 Top Coat: A one-part, UV resistant, aliphatic polyurethane top coat providing a colour-stable, weatherproof, slip resistant wearing surface.
- ❑ TREMproof Aggregate: Silica sand which imparts a textured finish.

**USAGE**

The following is a guide to estimate material usage:

Product	Coverage Rate		Thickness	
	1m <sup>2</sup> /L	18m <sup>2</sup> /Pail	1.0mm WFT	0.75mm DFT
Vulkem 350	1m <sup>2</sup> /L	18m <sup>2</sup> /Pail	1.0mm WFT	0.75mm DFT
Vulkem 346	2.6m <sup>2</sup> /L	49m <sup>2</sup> /Pail	0.38mm WFT	0.25mm DFT

TREMproof Aggregate: Approximately 1.8 to 2.2 kg of approved aggregate will be used with each Litre of Vulkem 346.

**PRIMING**

Vulkem 350R/SL requires TREMproof 200EC Primer, TREMprime Multi-Surface Urethane Primer or Vulkem 171 Primer depending on the site conditions.

Vulkem 350R/SL requires TREMprime Non-Porous Primer on metal and PVC surfaces, such as puddle flanges or flashing. Joints must be sealed with Dymonic 100 or TREMflex 50 and have a 150mm wide detail strip of Vulkem 350R/SL in order to cover seams, bolts and rivets prior to applying the full Vulkem 350/346 system.

## DETAIL WORK

*Note: Do not apply sealant or coatings 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. Lay a 6mm diameter backer rod or bond breaker tape into the corner at the juncture of all horizontal and vertical surfaces, such as floor to wall junctions, hobs, columns, or penetrations through the deck. Apply a bead of Dymonic 100 or TREMflex 50 25mm wide over the backer rod or bond breaker tape. Tool the sealant bead to form a 45° fillet. Use sufficient pressure to force out any trapped air and to assure complete wetting of the surface. Remove excess sealant from the deck or wall joint. NOTE: Backer rod is only required for moving joints.
2. Install a backer rod, 3mm to 6mm diameter larger than the joint width to all prepared control 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:
  - 2a. For joints 6mm to 12mm wide, the depth to width ratio should be equal.
  - 2b. Joints 12mm wide or greater should have a sealant depth to width ration of 1:2. The minimum joint size is 6mm x 6mm.
3. All cracks and joints shall be sealed with Tremco approved sealant, and tooled flush with the surface. Note: Expansion joints should not be coated over. For treatment of expansion joints, contact your local Tremco Representative.
4. Allow sealant to cure overnight.
5. Apply a strip of masking tape or duct tape to the vertical sections, at a height that complies with the requirements of AS4654.2, but a minimum of 40mm above the top edge of the sealant fillet to provide a neat termination of the vertical detail coat.
6. Prior to use, Vulkem 350R/SL should be mixed with a spiral paint mixing paddle at a rate of 500 rpm for a minimum of 3 min to ensure a homogenous mixture.
7. Apply 0.64mm thick detail coat of Vulkem 350R (Roller Grade) over the treated fillet, and extend it to the tape on the vertical surface and 100mm onto the horizontal surface. Feather-edge the terminating edge of the Vulkem 350R (Roller Grade) detail coat on the horizontal surface so it will not show through the finished coating.
8. Apply a 0.64mm thick detail coat of Vulkem 350R (Roller Grade) 150mm wide centered over all untreated cracks, all routed and sealed cracks and over all cold joints. Feather-edge terminating edge of detail coat to keep these edges from showing through the finished coating.
9. Allow all detail coats to cure for a minimum of 4 to 6 hr depending on temperature and humidity. NOTE: Recommended coverage rates are approximate. Sand loading methods and concrete surface profiles may increase the amount of material required to obtain uniform coverage.

## COATING APPLICATION

### Vulkem 350 Base Coat:

1. Apply Vulkem 350R/SL at rate of 1.0m<sup>2</sup>/L or 1 mm WFT thick to the entire area to be coated, including overall detail coats, but excluding expansion joints. The recommended method of application is with a notched squeegee. Cross-rolling may follow in the event the coating needs to be levelled. Vulkem 350R/SL can be applied with a solvent-resistant, medium-nap (9.5mm to 12.7mm) roller sleeve.
2. Allow Vulkem 350R/SL to cure a minimum of 8 hr. Cure rates depend on temperature and humidity. Refer to cure rate guidelines in chart at the end of this document. If the Vulkem

350R/SL has been applied for 24 hr or longer during the ideal temperature application range (see chart on last page of document), it should be cleaned with a damp cloth of Xylene (do not saturate it). Prime coat it with Vulkem 191 QD Primer. We highly recommend that you contact your local Tremco Representative with any questions on the appropriateness of priming.

### Vulkem 346 Top Coat:

1. After mixing, apply the Vulkem 346 with a medium-nap, solvent-resistant roller sleeve at a rate of 2.6m<sup>2</sup>/L to yield approximately 0.38 mm WFT. Remove excess material from the roller by using a screen in the pail to avoid puddles or ponding.
2. Apply the Vulkem 346 in sections that can be easily reached for back rolling. Immediately after applying the Vulkem 346, broadcast 0.4 to 0.5 mm diameter silica sand into the wet Vulkem 346 and back roll to fully encapsulate the aggregate. For a moderately and more uniform textured finish, use 1.8 to 2.2 kg of sand per litre of Vulkem 346, and then install a second coat of Vulkem 346 to lock in the aggregate. Back rolling is necessary regardless of how the sand is broadcast (i.e. hand, seed spreader, etc.) to ensure that all the sand is completely encapsulated into the liquid.
3. The textured properties of the finished deck coating system aid in the system's wear and slip resistance. Tremco recommends a test patch be completed by the applicator and customer acceptance obtained prior to the application.
4. Do not open to foot traffic for a minimum of 24 hr following full cure of Vulkem 346.

## CLEAN UP

- Clean all adjacent areas to remove any stains or spills with Tremco Xylol.
- Clean tools or equipment with Tremco Xylol before material cures.
- Clean hands by soaking in hot, soapy water, then brushing with a stiff-bristle brush.

## TROUBLESHOOTING

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

1. When a deck contains too much moisture, the moisture may change into a vapor, which then condenses at the concrete-membrane interface before the coating has cured and may cause blisters or bubbles, ultimately interfering with proper adhesion. If this should occur, the blisters can be cut out, allowing moisture to escape. After moisture has escaped and the surface is dry, the area can be repaired.
2. If the coating application has been installed at a thickness that is greater than our installation instructions, pinholes, blisters or bubbles may develop in the coating. To avoid this occurrence, the material should be applied in accordance to the installation instructions.
3. 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 Technical Services should this occur.
4. If the previous coating application has not fully cured, solvent may become trapped between the coats and lead to large blisters. When cut out, they may still be tacky on the underside. Blisters may be cut out and repaired after the surface has been allowed to fully dry.

## WEATHER IMPACT ON COATING APPLICATION

This section discusses the impact of applying these coatings outside the ideal temperature application range of 18 to 30°C at 50% RH.

1. At temperatures lower than the ideal range, the material will become viscous and it will cure at a slower rate. Refer to the chart below for approximate cure rates at varying temperatures.
2. Storing materials at cooler or warmer temperatures than ideal, will affect the handling and curing characteristics of the materials.
3. Deck temperatures may affect cure rates even when ambient temperatures are high.
4. Enclosed areas may slow the cure rate of the coating because humidity levels tend to be low in these conditions due to the low exchange of air over the membrane.
5. In extremely dry conditions, even when temperatures are high, cure rates can still be extended.

## APPROXIMATE CURE TIMES IN HOURS AT 50% RH

The following is a guide to estimate material usage:

Temperature at 50% RH	Vulkem 350R/SL	Vulkem 351
4.4 - 12.8°C	48 to 72	48
12.8 - 18.3°C	24 to 48	12 to 24
18.3 - 29.4°C	12 to 24	6 to 8
29.4°C	< or = 12	2 to 4

Variations in temperature and humidity can affect the cure rate of the coating. The above chart should be used as a guide only to determine the approximate rate of cure. Other factors can also influence the cure rate such as substrate temperature and enclosed environments.

## 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, call Customer Service on (02) 9638 2755 or fax (02) 9638 2955.

## 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.