

PRODUCT DESCRIPTION

Vulkem 350/346/346 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 traffic will use an aggregate-laden top membrane to aid in wear and slip resistance. Vulkem 350/346/346 may be used to apply a seamless, monolithic waterproof membrane to concrete and primed metal surfaces.

USAGE/PURPOSE

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

- Mechanical Rooms
- Stadiums
- Athletic Surfaces
- Roofs
- Similar applications that require an elastomeric, slip resistant, trafficable grade waterproofing system.

PACKAGING

- Vulkem 350 - Base Coat: 18.9L
- Vulkem 346 - Intermediate/Top Coat: 18.9L

COLOUR

- Vulkem 350 - Base Coat: Grey
- Vulkem 346* - Intermediate/Top Coat: Grey, Slate Grey

* Special colours are available upon request.



FEATURES & BENEFITS

- Tested to AS4654.1 to ensure compliance with the NCC for external waterproofing in Australia.
- Vulkem 346 top coat is a single component product, which provides efficient use of material for small areas
- Fast cure through time allows the area to be returned to use 24 hours after installation in most instances.
- Mildew- and fungus- resistance safeguards against environmental contaminants.
- Excellent durability and UV resistance extend the useful life of pedestrian systems.
- Re-coatable and compatible with other Tremco sealants, which enhances waterproofing protection with full system compatibility.

Vulkem 350/346/346

TYPICAL PHYSICAL PROPERTIES			
PROPERTY	TEST METHOD	Vulkem 350	Vulkem 346
Drying Time @23°C, 50% R.H.	ASTM D1640	12 hours	6-8 hrs
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, 1kg load)	ASTM D 4060	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%	20.80 Mpa, 210%
Temperature Resistance	AS4654.1 Clause 2.6	Pass	Pass
Ultraviolet Resistance	AS4654.1 Table A4	N/A	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 ² /24hrs	26.0 g/m ² /24hrs

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

SPECIFICATION CLAUSE

The trafficable membrane system is specified as Vulkem 350/346/346, a trafficable waterproofing system, comprised of a single component, moisture cured Polyurethane base coat, and single component, aliphatic Polyurethane wear and top coat.

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

- ❑ Do not apply to damp or contaminated surfaces.
- ❑ Use with adequate ventilation.
- ❑ Not suitable for heavy equipment use (fork lifts, large rubbish bins, snow plows, etc.). For these types of applications, please consult Tremco.

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 per ASTM F2659 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, shot blasting (preferred method) sandblasting and 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 1.6 mm wide or greater shall be ground out to a minimum 6 mm wide x 12 mm deep and treated according to the instructions in "Detail Work".
5. Structural cracks regardless of width shall be ground out to a minimum 6 mm wide x 12 mm deep and treated according to the instructions in "Detail Work".
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 6 mm wide x 12 mm 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 ALL METAL SURFACES

All surfaces shall be sand-blasted to meet the requirements in AS 1627.4, class 2.5 for "Near White Metal".

JBSITE 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 concrete and wood 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 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.
- ❑ TREMproof Aggregate: Silica sand which imparts a textured finish. Sizes vary from 6/30.

USAGE:

The following is a guide to estimate material usage: This does not account for material wastage on-site or reduced coverage due to substrate porosity/aggregate profile:

PRODUCT	COVERAGE RATE		THICKNESS	
Vulkem 350	1m ² /L	18m ² /Pail	1.0mm WFT	0.75mm DFT
Option 1: Standard System				
Vulkem 346 (Sand Seeded)	2.6m ² /L	49m ² /Pail	0.38mm WFT	0.25mm DFT
Vulkem 346	2.6m ² /L	49m ² /Pail	0.38mm WFT	0.25mm DFT
Option 2: Higher Wear Resistance				
Vulkem 346 (Sand Seeded)	2.6m ² /L	49m ² /Pail	0.38mm WFT	0.25mm DFT
Vulkem 346 (Sand Seeded)	2.6m ² /L	49m ² /Pail	0.38mm WFT	0.25mm DFT
Vulkem 346	2.6m ² /L	49m ² /Pail	0.38mm WFT	0.25mm DFT

NOTE: TREMproof Aggregate: Approximately 0.3 to 2.2 kg of approved aggregate will be used with each Litre of Vulkem 346.

PRIMING

Note: Do not apply primer, sealants or membranes 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.

- Vulkem 350 requires a Tremco approved primer on all porous substrates such as concrete, masonry, brick or stone prior to application of the Vulkem 350 membrane. TREMproof 200EC primer, or Vulkem 171 primer should be used depending on site conditions and requirements of the project. Please refer to the appropriate product data sheet regarding application instructions
 - For porous substrates that are not expected to need a vapour retarder, it is suggested to prime prepared substrate with Vulkem 171 Primer. Please refer to the appropriate product data sheet regarding application instructions.
 - For porous substrates that are expected to need a vapour retarder, it is suggested to prime the prepared substrate with TREMproof 200EC. Please refer to the appropriate product data sheet regarding application instructions.
- Vulkem 350 requires TREMprime Non-Porous Primer on metal and PVC surfaces, such as puddle flanges or flashing. Please refer to the appropriate product data sheet regarding application instructions.

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. Best practice is to install closed-cell 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. This is to prevent 3-sided adhesion of the sealant. NOTE: This is recommended by Tremco for all joints, however it is required for all expected moving joints.
2. Apply a bead of Dymonic 100/TREMflex 50, over the backer rod/bond breaker tape as per requirements of AS4654.2. 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.
3. All cracks and joints shall be sealed with Tremco approved sealant, and tooled flush with the surface. Note: Expansion/movement joints should not be coated over. For treatment of expansion/movement joints, contact your local Tremco Representative.
4. Joint/Crack Treatment: Install a backer rod, 3 mm to 6 mm 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:
 - a. For joints 6 mm to 12 mm wide, the depth to width ratio should be equal.
 - b. Joints 12 mm wide or greater should have a sealant depth to width ratio of 1:2 The minimum joint size is 6 mm x 6 mm.
5. Allow sealant to cure.
6. Apply a strip of masking tape or duct tape to the vertical sections, at a height that complies with the requirements set forth in AS4654.2, but a minimum of 40 mm above the top edge of the sealant fillet to provide a neat termination of the vertical detail coat.
7. Prior to use, Vulkem 350 should be mixed with a spiral paint

mixing paddle at a rate of 500 rpm for a minimum of 3 minutes to ensure a homogeneous mixture.

8. Apply 1.00 mm thick detail coat of Vulkem 350 over the treated fillet and extend it to the tape on the vertical surface and 100 mm onto the horizontal surface. Feather-edge the terminating edge of the Vulkem 350 detail coat on the horizontal surface so it will not show through the finished coating.
9. Apply a 1.00 mm thick detail coat of Vulkem 350, 150 mm 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.
10. Allow all detail coats to cure for a minimum of 4 to 6 hours depending on temperature and humidity.
11. Where movement is anticipated, Tremco suggests that a polypropylene bond breaker tape is placed over the detail coat over the treated joint prior to subsequent membrane application.

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. Pre-mix the Vulkem 350 base coat with a spiral paint mixing paddle at a rate of 500 rpm for a minimum of 3 minutes to ensure a homogeneous mixture.
2. Apply Vulkem 350 at rate of 1.0m²/L or 1.0mm WFT 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 350 can be applied with a solvent-resistant, medium-nap (9.5 mm to 12.7 mm) roller sleeve.
3. Allow Vulkem 350 to cure a minimum of 12 hours and a maximum of 24 hours. Cure rates depend on temperature and humidity. Refer to cure rate guidelines in chart at the end of this document. If the Vulkem 350 has been applied for 24 hours or longer during the ideal temperature application range, it should be cleaned with a damp cloth of Tremco Xylol (do not saturate it) and re-activated with Vulkem #191QD re-activation primer. We highly recommend that you contact your local Tremco Representative with any questions on the appropriateness of priming.

Vulkem 346 WEAR COAT:

Option 1 Standard System:

1. Pre-mix the Vulkem 346 to assure no settlement of the material is in the bottom of the pail and the colour of the material is consistent with no streaks or striations. Open, mix and use one pail at a time.
2. Vulkem 346 is applied with a squeegee or medium-nap roller at the rate of 2.60m²/L yielding approximately 0.38 mm wet film thickness.
3. Whilst Vulkem 346 is wet, broadcast sand to create a non-slip finish. There are two approved methods of applying aggregate to the Vulkem traffic system. Tremco recommends the Sand to Refusal method, however based on aesthetic and minimum slip ratings, the Backroll method is also available

Sand to Refusal Method

- Immediately after applying Vulkem 346, broadcast 16/30 mesh silica sand to refusal (flood coat).
- Allow the Vulkem 346 to cure, about 6 - 8 hours until it is tacky but a firm film that will not be displaced during excess sand removal.
- Prior to top coating, sweep or blow off any excess sand that

is not well bonded to the Vulkem 346 membrane.

Backroll Method

- Immediately after applying Vulkem 346, broadcast 0.3 to 0.7 kg of 16/30 mesh silica sand per m² of Vulkem 346 intermediate coat installed.
 - Backroll the sand into the coating to ensure all the aggregate is evenly distributed.
 - Allow the Vulkem 346 to cure about 6 - 8 hours until it is tacky but a firm film.
4. Allow the Vulkem 346 to cure for approximately 6 - 8 hours, and a maximum of 24 hours before top coating. Cure rates depend on temperature and humidity. Refer to cure rate guidelines in the chart at the end of this document. If the Vulkem 346 has been applied for 24 hours or longer, it should be cleaned with a damp cloth of Tremco Xylol (do not saturate it) and re-primed with Vulkem Primer #191 QD re-activating primer. We highly recommend that you contact your local Tremco Representative with any questions on the appropriateness of priming.

Option 2: Where higher wear resistance is desired, Tremco recommends:

1. Pre-mix the Vulkem 346 to assure no settlement of the material is in the bottom of the pail and the colour of the material is consistent with no streaks or striations. Open, mix and use one pail at a time.
2. Vulkem 346 is applied with a squeegee or medium-nap roller at the rate of 2.60m²/L yielding approximately 0.38 mm wet film thickness
3. Whilst Vulkem 346 is wet, broadcast sand to create a non-slip finish. There are two approved methods of applying aggregate to the Vulkem trafficable system. Tremco requires the Sand to Refusal method in these areas.

Sand to Refusal Method

- Immediately after applying Vulkem 346, broadcast 16/30 mesh silica sand to refusal (flood coat).
 - Allow the Vulkem 346 to cure, about 6 - 8 hours until it is tacky but a firm film that will not be displaced during excess sand removal.
 - Prior to over coating, sweep or blow off any excess sand that is not well bonded to the Vulkem 346 membrane.
 - Apply another coat of Vulkem 346.
 - Allow the Vulkem 346 to cure, about 6 - 8 hours until it is tacky but a firm film that will not be displaced during excess sand removal.
 - Prior to top coating, sweep or blow off any excess sand that is not well bonded to the Vulkem 346 membrane.
 - Allow the Vulkem 346 to cure about 6 – 8 hours.
4. Allow the Vulkem 346 to cure for approximately 6 - 8 hours, and a maximum of 24 hours before top coating. Cure rates depend on temperature and humidity. Refer to cure rate guidelines in the chart at the end of this document. If the Vulkem 346 has been applied for 24 hours or longer, it should be cleaned with a damp cloth of Tremco Xylol (do not saturate it) and re-primed with Vulkem Primer #191 QD re-activating primer.

Vulkem 346 TOP COAT

1. Pre-mix the Vulkem 346 to assure no settlement of the material is in the bottom of the pail and the colour of the material is consistent with no streaks or striations. Open, mix and use one pail at a time.
2. Vulkem 346 is applied with a squeegee or medium-nap roller at the rate of 2.6 m²/L yielding approximately 0.38 mm wet film thickness.
3. Tremco recommends a minimum of 72 hours after the final top coat has cured before allowing pedestrian traffic on the deck but 5 days is preferred.

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 vapour, 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 Tremco 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.	Vulkem 350	Vulkem 346
4.4°-12.8° C	24 to 72	48
12.8°-18.3° C	6 to 24	12 to 24
18.3°-29.4° C	4 to 6	6 to 8
29.4° C	< or = 4	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. For more information about proper application procedures please refer to the Installation Instructions or contact Technical Services.

HEALTH AND 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.

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.