RESIDENTIAL & COMMERCIAL

INDUSTRIAL & MARINE

ART & CRAFT

SHIMICOAT
SURFACE SOLUTIONS

# PU CEMENT

## *Structural Resin Pad*

### *Polyurethane Concrete Flooring System*

## *An Installation Guide*

SHIMICOAT PU CEMENT, a highly specialized product for industrial and commercial floor applications, particularly where tough conditions demand high-performance solutions.

1. **Composition & Application**:
   - PU CEMENT is a three-component, solvent-based Polyurethane resin mortar with a fine texture.
   - It is cement-based and self-levelling, ideal for creating base layers on concrete floors ranging from 2 to 9 mm in thickness.
2. **Performance Under Extreme Conditions**:
   - Suitable for environments exposed to high temperatures (up to 120°C). For such conditions, a minimum of 9 mm thickness is recommended.
   - Exceptional resistance to a variety of acids (like acetic, lactic, phosphoric acids) and sanitizing chemicals (e.g., peroxyacetic acid solutions).
3. **Ideal Use**:
   - Applied as a topping on floors subjected to harsh service conditions.
   - Excellent choice for environments requiring resistance to food acids and organic acids.
4. **Finishing Options**:
   - Typically applied as a 6 mm broadcast topping with options for anti-slip finishes.
   - The surface can be sealed with either a clear or tinted Polyurethane topcoat, with or without aggregate, depending on the desired finish.

This product well-suited for industries like food processing, pharmaceuticals, or places requiring durability and easy-to-clean flooring systems.



Ph: (08) 9364 7446 | info@shimi.com.au | ABN: 28 622 871 283 | **www.shimi.com.au**

## Fields of Application:

- **High-Performance Levelling Layer:** Used as a base layer before applying top shield finishes like Polyurethane, Polyurethane, or PolyAspartic coatings.
- **Regulation and Repair of Humid Substrates:** Ideal for regulating and repairing substrates with humidity issues before applying finishing layers with Polyurethane, Polyurethane, or PolyAspartic resins.
- **Surface Protection in Harsh Environments:** Utilized for regulating, repairing, and protecting concrete surfaces that are exposed to aggressive chemical or physical conditions.
- **Self-Levelling Coating for Humid Areas:** Provides a self-levelling final coating for substrates in environments with light, constant humidity or limited ventilation.

## Properties

1. **Mechanical Strength**: The material exhibits both high initial and final mechanical strengths, ensuring durability and stability over time.
2. **Vapour Barrier**: It acts as a temporary vapour barrier, particularly useful on damp substrates, which helps prevent blisters in final resin coatings.
3. **Chemical Resistance**: The material has a strong resistance to chemicals, making it suitable for environments where exposure to harsh substances is possible.
4. **Self-Levelling**: It self-levels, providing a smooth and fine finish without needing extra manual intervention.
5. **Abrasion Resistance**: The material has excellent abrasion resistance, ensuring it can withstand wear and tear, ideal for high-traffic areas.
6. **Curing and Re-coating Time**: After 24 hours (at 20 °C and 50% relative humidity), it can be coated with resins, allowing for efficient workflow without prolonged wait times.
7. **Solvent-Free & 100% Solid**: It is a solvent-free and 100% solid system, which is an eco-friendly feature, ensuring no harmful emissions during application.
8. **Indoor and Outdoor Use**: This flooring system is versatile, making it suitable for both indoor and outdoor applications.

Is this related to a specific product you're working with or researching? Let me know if you need more information or clarification!

## HOW TO USE

**Substrate Preparation:**

1. Surface Cleanliness:
   Ensure the substrate is free of any loose, brittle materials, such as old coatings or debris. Additionally, remove any contaminants like grease, oil, or pollutants. These substances can hinder adhesion and affect the performance of the final coating.
2. Dust Removal:
   Vacuum the surface thoroughly to eliminate any dust. Dust and small particles can also affect adhesion and the final finish.
3. Surface Moisture:
   The substrate should be dry or slightly moist but never waterlogged. Excess water content can weaken bonding or compromise the curing process of the material applied on top.

4. Concrete Substrate Preparation:
   For concrete surfaces, mechanical preparation is key. Some common methods include:
   - Sanding: Using abrasive materials to smooth and clean the surface.
   - Shot Blasting: Using high-velocity steel shot to remove contaminants and create a roughened surface.
   - Metal Bond Diamond Grinding (Preferred): This method uses a grinding tool with metal-bonded diamond abrasives to efficiently remove surface slurry and create a smooth, open-pore surface. This is the most effective method for preparing concrete, as it not only removes contaminants but also provides the ideal texture for bonding.
5. Achieving an Open Pore Surface:
   The goal of the mechanical preparation is to create an open-pore surface that allows for maximum adhesion. The surface should be as smooth and even as possible, without excess slurry or residue from the preparation process.

---

This preparation step is essential for ensuring a solid bond between the substrate and any subsequent layers, whether they are coatings, paints, or other surface treatments. It also contributes to the durability and longevity of the finish.

**Primer:**
On porous and concrete substrates, apply Premium Tinted Polyurethane as primer using a brush or 10-12 Nap roller, allowing the product penetrate into the substrate with an approximate consumption of 1Lt/5sqm.

## Mixing:

1. **Mix Polyurethane Components (A and B):**
   - Pour **Component A** over **Component B**.
   - Use a low-speed electric stirrer to mix them together.
   - Stir gently to avoid trapping air in the mixture until fully blended.
2. **Add Cement Component (Part C):**
   - Transfer the mixed Polyurethane into a clean, appropriately-sized container.
   - Gradually add **SHIMICRETE (Part C)**, mixing continuously with the electric stirrer.
   - Keep mixing until a smooth, even consistency is achieved.

This approach ensures that the Polyurethane and cement components are blended effectively without introducing air, resulting in a smooth final product.

**Application Process:**

1. **Timing for Application:**
   - **PU CEMENT** should be applied when the primer (likely a base coat or primer for the surface) feels either tacky or tack-free. This is an indication that the primer is at the right level of dryness for proper adhesion.

2. **Spreading the Product:**
    - **Use a notched trowel or rubber rake** to spread **PU CEMENT** evenly. The thickness should be controlled, so ensure the tool is calibrated accordingly for your desired coverage.
3. **Air Removal and Surface Smoothness:**
    - Once the product is spread, immediately use a **bristle roller** over the surface. This step helps eliminate trapped air bubbles and ensures an even and smooth coating.
4. **Curing Time:**
    - Allow the **PU CEMENT** to cure for **at least 24 hours** before applying an Polyurethane finish. Make sure the surface humidity of the **BETOPOX® CEMENT** is below **4%** before applying the Polyurethane finish. This is crucial because high humidity can negatively affect the adhesion and finish.

**Tool Cleaning:**

- Clean your tools immediately after use with **EpoDil** or **Xylene**. These solvents will effectively remove the uncured product.
- Once the product hardens, cleaning can only be done mechanically (scraping, etc.), so prompt cleaning is key to maintaining tool usability.

This procedure ensures a durable, smooth, and properly bonded finish.

## COVERAGE

The approximate coverage is 2 kg/m2 to achieve 1mm thick. However, the final amount used will depend on the condition of the substrate, its porosity, levelling and the site conditions.

## PACKAGING

**Pre-metered 30Kg units of:**

| | |
|---|---|
| Part A Resin: | 4Kg |
| Part B Hardener: | 2Kg |
| SHIMICRETE: | 15Kg |
| Silica Sand / Quartz Topping: | 9Kg |
| Colour: | Natural Cement Colour / No Tint |

## STORAGE

12 months, in its original closed packaging, in a cool, covered place, protected from humidity, sunlight and freezing temperatures.

SHIMICOAT
SURFACE SOLUTIONS

# Direction

## SUBSTRATE PREPARATION & APPLICATION

The requirements for preparing a concrete surface before applying a PU CEMENT:

1. **Surface Requirements:**
   - The concrete must be firm, clean, and dry.
   - The compressive strength should be at least **25 MPa**.
   - The surface tensile strength should be a minimum of **1.5 MPa**.
   - New concrete must be **at least 7 days old**.
2. **Surface Preparation:**
   - Mechanically prepare the surface using one of the following methods: **diamond grinding, shot blasting, or scarifying**.
   - Remove all weak and loose material, surface laitance, contaminants, coatings, or curing compounds.
   - Ideally, the prepared surface should have a **profile** that ensures both **chemical** and **mechanical adhesion** for the topping or coating.
3. **Grooves and Saw Cuts:**
   - **Anchoring grooves** (minimum **10 mm wide** and **10 mm deep**) must be cut just inside the perimeter of the area to be coated and around drains.
   - **Double diamond blade saw cuts** (6 x 6 mm) should be placed across the floor at intervals of no more than **4 meters**.
4. **Porous Concrete:**
   - **Priming** is required for porous concrete. If unsure, on-site testing should be carried out to confirm this.

**PRIMING**

Apply a 1mm scratch coat of diluted Tinted or Clear Polyurethane to the prepared surface.

**APPLICATION GUIDELINES / *SAFETY PRECAUTIONS***

Wear gloves, eye protection masks and overalls during mixing and application. Refer to msds for further information.

**MIXING INSTRUCTIONS**

1. **Mixing PU CEMENT Resin and Hardener**:
   - **Use a mechanical variable-speed helical mixer** for efficiency. Start by mixing the resin and hardener together.
   - **Time for Mixing**: Mix for **1-2 minutes** to ensure proper blending of both components.
   - **Speed**: The variable-speed feature allows you to adjust the mixing speed as needed to avoid splashing or over-shearing the mixture.
2. **Incorporating the SHIMICRETE Aggregate**:
   - After the resin and hardener are mixed, **add the SHIMICRETE aggregate** (a pre-measured bag) into the mixture.
   - **Continue mixing** until the aggregate is thoroughly incorporated into the resin and hardener mixture.
3. **Achieving a Homogeneous Mixture**:
   - Continue mixing until the material is completely **homogeneous**, meaning there are no visible streaks or separate components, and the mix has a consistent texture and appearance.
4. **Maintaining the Wet Edge**:
   - Once mixed, it is crucial to **maintain the continuity of the material** on-site to ensure the wet edge of the applied topping remains consistent.
   - If the material starts to cure or set before it is applied, it could result in an uneven finish or bonding issues.

**SELF LEVELLING 4MM TOPPING**

1. **Preparation**:
    - Ensure the surface is properly prepared and clean before applying the mixed product. The surface should be free of dirt, dust, grease, or any other contaminants that could affect the adhesion of the product.
2. **Mix the Product**:
    - Mix the product thoroughly according to the manufacturer's instructions. This could be a resin, compound, or Polyurethane, depending on the application.
3. **Application**:
    - Use a **pin rake** or **notched trowel** to spread the mixed product evenly over the surface.
        - A **pin rake** is generally used for more textured finishes or to apply product with a controlled depth.
        - A **notched trowel** is ideal for a more even spread, as it leaves behind consistent lines of product at a set thickness.
    - The desired thickness for the application should be **3-4mm**. Make sure the trowel or rake is set to the correct depth to achieve this.
4. **Spiked Roller**:
    - After the product is applied, use a **spiked roller** to remove any entrained (trapped during mixing) and entrapped (trapped after application) air bubbles in the topping.
    - The spiked roller should be rolled over the surface while the product is still wet to ensure even distribution and a smooth finish. This also helps in reducing the possibility of bubbles forming or compromising the surface finish.
5. **Curing**:
    - Allow the product to cure according to the manufacturer's recommendations before any additional treatment or use.

This method ensures an even, smooth finish without air bubbles and a properly applied layer.

**ANTI-SLIP 6MM TOPPING**

Applying a 6 mm anti-slip topping over a 4 mm self-levelling topping, using a broadcast technique with a chosen aggregate to create a beach finish, followed by sealing with **Hycrete PU-TC(m)**. Here's a simplified breakdown of the steps involved:

1. **Preparation of Base Surface:**
    - Ensure the substrate is clean, dry, and free of any contaminants that could interfere with adhesion.
2. **Application of 4 mm Self-Levelling Topping:**
    - Apply the self-levelling topping evenly over the substrate.
    - Allow it to level and cure properly.
3. **Broadcasting 6 mm Anti-Slip Topping:**
    - Once the self-levelling topping has cured, broadcast the 6 mm aggregate over it to achieve a textured, beach-like finish.
    - The size of the aggregate will directly influence the non-slip texture.
4. **Curing the Anti-Slip Topping:**
    - Let the topping cure, allowing the aggregate to bond effectively.
5. **Sweeping and Vacuuming Excess Aggregate:**
    - After curing, sweep off any excess aggregate and use a vacuum to ensure the surface is clean and the texture is uniform.
6. **Sealing the Surface:**
    - Once the surface is prepared, apply **Clear or Tinted Polyurethane** as a sealer. This will lock in the non-slip finish and provide additional protection.
7. **Non-Slip Texture Determination:**
    - The level of non-slip texture will be determined by the size of the aggregate used in the broadcast. Larger aggregates will result in a rougher texture, while smaller ones will give a more subtle non-slip finish.

SHIMICOAT
SURFACE SOLUTIONS

## ANIT-SLIP 9MM TOPPING

To achieve a final film thickness of 9 mm using the PU CEMENT broadcast system in two layers, with Clear or Tinted Polyurethane as the final seal coat to lock in the PU CEMENT, here's how you can approach the process:

**Step 1: Preparation**

- Surface Preparation: Ensure the surface to be coated is clean, dry, and free of contaminants. This may involve sanding, grinding, or shot blasting, depending on the existing surface condition.
- Mixing PU CEMENT: Follow the manufacturer's instructions to mix the PU CEMENT system properly. Ensure that the components are mixed thoroughly for uniform application.

**Step 2: Apply First Layer of PU CEMENT**

1. Spread the First Layer: Apply the first layer of PU CEMENT. This will be the base layer, and it typically needs to be thick enough to form the foundation. You can aim for a layer thickness of approximately 4.5 mm. This will depend on the exact specifications of the PU CEMENT system you're using.
    - Application Method: Use a notched trowel, squeegee, or roller to apply the material evenly across the surface.
2. Broadcast Aggregate (if needed): If your system calls for broadcasting aggregates (such as sand or chips), do so while the first layer is still wet, ensuring an even distribution. This will create a textured surface to help with the bonding of the second layer.
    - Cure Time: Allow the first layer to cure as per the manufacturer's instructions before proceeding with the second layer. The curing time will vary based on the environmental conditions, such as temperature and humidity.

**Step 3: Apply Second Layer of PU CEMENT**

1. Spread the Second Layer: Once the first layer has cured, apply the second layer of PU CEMENT. This layer should be slightly thinner than the first layer, about 4.5 mm, to build up the final thickness to 9 mm.
    - Application Method: Apply the second layer using the same tools as before, ensuring a smooth, even coat over the first layer.
2. Broadcast Aggregate (if needed): If necessary, broadcast additional aggregate over the second layer before it cures to ensure proper bonding and texture.
    - Cure Time: Again, follow the manufacturer's recommendations for curing time.

**Step 4: Final Seal Coat with Clear or Tinted Polyurethane**

1. Prepare the Polyurethane Seal Coat: Once the second layer of PU CEMENT has fully cured, mix and prepare the Clear or Tinted Polyurethane seal coat according to the product instructions.
2. Apply the Seal Coat: Apply a thin and even coat of the Clear or Tinted Polyurethane. The purpose of this seal coat is to lock in the PU CEMENT and provide a protective, durable finish. This layer will also add a glossy or tinted appearance, depending on the Polyurethane used.
    - Application Method: Use a roller or brush to apply the Polyurethane evenly across the surface.
3. Cure Time: Allow the seal coat to cure according to the Polyurethane manufacturer's guidelines.

**Step 5: Final Inspection**

- Inspect the final surface for uniformity in thickness and coverage. Ensure that the total film thickness is around 9 mm, with the first and second layers of PU CEMENT and the final seal coat contributing to the total thickness.
- Conduct a touch test to ensure the coating is firm and fully bonded.

**Additional Considerations:**

- Environmental Conditions: Ensure that the temperature and humidity levels are within the specified range for the materials you're using, as this can impact curing times and performance.
- Safety: Always wear appropriate protective equipment, including gloves, goggles, and respirators, if necessary, when working with Polyurethane and related materials.
- Curing Time: Be mindful of the curing times for each layer, and avoid rushing the process to ensure the integrity of the system.

By following above steps and ensuring the proper application of the PU CEMENT broadcast system and the Clear or Tinted Polyurethane seal coat, you should achieve a final thickness of 9 mm and a durable, aesthetically pleasing surface.

Apply the PU CEMENT broadcast system in two layers to achieve a final film thickness of 9 mm using the Clear tor Tinted Polyurethane as a final seal coat to lock in the PU CEMENT.

**Aggregates**

- **Aggregate Hardness & Durability**: The hardness of the broadcasting aggregate (used in the flooring system) directly influences the durability and lifespan of the flooring. In environments exposed to heavy, hard-wheeled traffic or mechanical abrasion, choosing a harder aggregate like **Bauxite** or **Aluminum Oxide** is highly recommended.
    - **Quartz Sand** is categorized as "hard," but for heavy-duty environments, it's better to opt for aggregates like **Bauxite (harder)** or **Aluminium Oxide (hardest)** for maximum performance.
- **Coverage & Packaging**:
    - Coverage for **Hycrete PU-SL(m)** is measured at **1 liter/m²** per **mm thickness**.
    - Packaging consists of three components:
        - **Part A (resin)**: 3 kg
        - **Part B (hardener)**: 3 kg
        - **Part C (aggregate)**: 15 kg
    - The mix yields a total of **10 liters** of the finished product.
- **Limitations**:
    - **UV Discoloration**: The flooring system can discolour when exposed to UV light (from sunlight or artificial sources). The extent of discoloration depends on the color choice, but this doesn't affect the performance of the product.

*Mixing Epoxy Mortar*

- **Shelf Life**:
    - The shelf life of **PU CEMENT** is over **24 months**, provided it's stored away from sunlight in its original, unopened packaging. In general, the products shall be stored out of direct sunlight and heat at all times.

## Curing Times

SHIMICOAT Polyurethane Mortar Mortar dries in 8-20 hours depending on atmospheric temperature. High temperatures and windy conditions may speed up the curing time. Complete curing process and full hardness is achieved after 7 days.

| Temp °C | Pot Life (min) | Surface Dry (Hours) | Initial Cure (Hours) | Recoat Time (Hours) | Fully Cured (Days) |
|---|---|---|---|---|---|
| 10°C | 45 | 12 | 24 | 24 | 7 Days |
| 20°C | 40 | 10 | 18 | 18 | 7 Days |
| 30°C | 35 | 8 | 16 | 16 | 7 Days |

SHIMICOAT
SURFACE SOLUTIONS

## HELPFUL HINTS

These indications are crucial for ensuring the correct application and performance of the product:

1. **Avoid water contact for 24 hours**: After applying the product, ensure no direct exposure to water for at least one day to allow proper curing.
2. **Ensure proper ventilation**: When applying indoors, adequate ventilation is necessary to prevent any excess moisture build-up.
3. **Surface humidity requirements**: If covering the coating with another material, ensure the surface humidity is under 4%.
4. **Substrate temperature**: The surface temperature should be between +5ºC and +30ºC for optimal adhesion and curing.
5. **Humidity levels**: The relative humidity in the area must not exceed 70% during application to avoid negative effects on the product's performance.
6. **Concrete strength requirements**: The substrate concrete must meet minimum strength standards: tensile strength of at least 1.5 N/mm² and compression strength of at least 20 N/mm².
7. **Do not dilute**: Avoid adding any solvents like EpoDil or Xylene, as these can compromise the product's properties, leading to issues like blistering and swelling.
8. **Avoid partial mixtures**: Always use the full quantity of product for the mix to prevent errors in calculations and ensure consistency.
9. **Thickness for humidity barrier**: If using as a humidity barrier, apply a minimum thickness of 3 mm.

These guidelines will help ensure the application goes smoothly and the final result is as intended.