PU CEMENT

Polyurethane Cement – Structural Resin Pad

Description

SHIMICOAT PU CEMENT is a specialized durable polyurethane concrete flooring solution, designed for tough service conditions. It is applied in varying thicknesses and is ideal for environments requiring high-temperature resistance (up to 120°C) and strong chemical resistance. SHIMICOAT PU CEMENT comprises of Clear Polyurethane Resin (100% Solid) and reinforcing cementitious filler materials and slip resistant topcoat broadcast to provide hard and durable mortar structure. This product well-suited for environments that are subject to heavy chemical exposure, high temperatures, and physical wear, such as industrial settings, manufacturing plants, abattoirs or laboratories. Modern, hygienic, functional and economical surface.

Key Features:

- **Heat Resistance (120°C)**
- **Chemical Resistance**
- **Durability in many Finish Options**
  - **Broadcast topping** (usually 6mm thick), which is then sealed with a clear or tinted polyurethane. The system can also include anti-slip finishes.
  - **Smooth seamless layer** (4mm thick) as a self-levelling solution, where you can choose the finish.
- **Application Options:**
  - **Broadcast System (6 mm):** Includes anti-slip finishes and requires sealing with SHIMICOAT Clear or Tinted Polyurethane topcoat.
  - **Single-Layer System (4-9 mm):** Self-levelling, seamless, and smooth finish.

PU CEMENT is an ideal flooring choice for industries requiring high durability, thermal tolerance, and chemical protection.

KIT CONTENT

Product Description	Size	Code	Quantity
SHIMICRETE	15Kg Bag	SC	1
PU CEMENT Polyurethane Resin	7Lt (5.5Lt of A & 1.5Lt of B)	EE	1
Quarts Silica Sand	9Kg	QS	1

10Lt Resin Mix Yield

Coverage Per Kit *(10Lt Resin Blend Yield)*

Resin Pad Thickness	Usage	Coverage
2-4mm	2-4Lt/sqm	3-5sqm Per Kit (10Lt Yield)
4-6mm	4-6Lt/sqm	2-3sqm Per Kit (10Lt Yield)
6-9mm	6-9Lt/sqm	1-2sqm Per Kit (10Lt Yield)

NOTE: Mathematically, each Lt covers 1sqm at 1mm thickness.

PU CEMENT

Technical Datasheet – V01 / 2025

FEATURES AND BENEFITS

SHIMICOAT Polyurethane Mortar Kit "PU CEMENT" is a high-performance flooring product that is perfectly suited for industrial and commercial environments. It's designed to meet the demanding conditions found in spaces such as factories, warehouses, and food processing area.

- Durability
- Chemical Resistance
- Fast Installation
- Moisture Tolerance
- Chemical Accelerator
- Non-slip Texture
- Pre-Packaged Kit
- Range of Colours
- 100% Solid Clear Polyurethane Resin
- Optimized Cementitious Reinforcing Filler Materials
- High MPa of Over 100
- Maximum Reinforcement Polyurethane Structure
- Easy to Mix and Apply
- Thermal Stability
- Longevity
- Self-Levelling
- Hygienic and Functional
- DIY Friendly
- HACCP Certified
- Water Contact Safe

This flooring system is the perfect solution for industrial and commercial spaces that require durable, safe, and easy-to-maintain flooring.

Physical & Chemical Properties of PU CEMENT:

Mixing ratio by weight (Kg) A:B A:B:C	 4A:1B 4A:1B:20C
Colour of Blend	Resin is Ultra Clear and transparent Blended with Cement Grey
Pot Life @25°C	45min
Re-Coating Time @25°C	24 Hours
Application Ttemperature (min 3°C above Dew Point)	5 to +30 °C
Material consumption	2 kg/m2 per mm
Packing Density of Blended Resin (Kg/Lt)	2 Kg/Lt– Each Kg is 0.5Lt (20Kg is ~10Lt)
Overcoating @ 25 °C	12 -24 hours
Cure time @ 25 °C: Touch Dry Foot Traffic Heavy Traffic Chemical Exposure / Total Hardening	 4 Hours 12 - 20 hours 2 days 7 days
Coefficient of expansion – PU CEMENT *Slightly More than concrete*	12-14 x 10^{-6} / °C
Coefficient of expansion - Concrete	8-12 x 10^{-6} / °C
Adhesive strength	> 1.5 MPa
Tensile strength	7 MPa
Elastic Modulus	2 GPa
Flexural strength	15 - 20 MPa
Compressive strength	45 - 55 MPa
Temperature resistance	-20 °C to 120 °C
Hardness (Shore D)	80 (7 days)
Consistency and Flow	Semi-Self Levelling Polyurethane Mortar
7 Days Compression Strength	>25 N/mm^2
Shore D	>75
Compression Strength	C40 (>40 N/mm^2)
Flexural Strength	F10 (?10N/mm^2)
Water Resistance	A9 (<9cm^3/50cm^2)

CHEMICAL RESISTANCE

Specific resistance properties of Fire Resistant Ceramic Coating in harsh chemicals:

Resistance Code Explanation

Code	Resistance Level	Description
A	***Excellent***	Safe for long-term immersion
B	***Good***	Safe for short-term immersion (max 3 days)
C	***Caution***	Spill/splash only – must clean within 8 hours
D	***Danger***	Not recommended

Mineral Acids Resistance

Acid	Rating
Hydrochloric (conc.)	B
Sulphuric Acid	C
Acetic Acid 10%	A
Acetic Acid 20%	B
Nitric Acid 10%	A
Nitric Acid 20%	B
Nitric Acid 35%	C
Phosphoric Acid 15%	A
Phosphoric Acid 35%	A
Phosphoric (conc.)	C

Organic Acids Resistance

Organic Acid	Rating
Acetic Acid 5% (Vinegar)	A
Acetic Acid 10%	A
Acetic Acid 20%	B
Butyric Acid 10%	A
Citric Acid 50%	A
Lactic Acid 15%	A
Oleic Acid	A

Other Solvents/Cleaners

Chemical	Rating
Ammonium Hydroxide 20%	A
Sodium Hydroxide 20%	A
Potassium Hydroxide 20%	A
Salt Solutions 10%	A
Sodium Hypochlorite 4%	C

Fats, Oils & Solvents

Substance	Rating
Xylene	A
MEK (Methyl Ethyl Ketone)	C
Diesel	A
Ethanol	A
Acetone	B
Kerosene	A
Unleaded Petrol	A
Wine & Beer	A
Animal Fat	A
Ethyl Alcohol	B
Lubricating Oils	A
Aromatic/Ketone Solvents	A
Hydraulic Fluid	B
Vegetable Oil	A

Resistance properties of PU CEMENT / Cementitious mortar for screeds and floor finishing

THERMAL PROPERTIES	Thermal Conductivity: 1.9 W/M°K / BS 874 / Thermal Expansion Coefficient: 28.2 ppm/°C / ASTM E228 / Thermal Stability: **140°C**	**Alkalis**	Resist Short term immersion in all alkalis.
Weather Proofing	All Polyurethane Coatings may yellow with time. Weatherproof top coat may be used if required.	**Salts & Brines**	Resist continuous or long-term immersion in all Salts & Brine systems.
Solvents	Resistant to most hydrocarbon solvents and alcohols.	**Water**	Excellent resist to continuous or long term immersion in fresh & Salt Water.
Acids	Resist splash and spills in all acids.	**Abrasion**	Excellent when fully cured (7 Days)

INDUSTRY APPLICATIONS

SHIMICOAT PU CEMENT has many applications such as:

- Abattoirs
- Meat processing establishments
- Bakeries and dairy industries
- Food processing plants
- Fish processing industries
- Breweries and wineries
- Cold storage warehouses
- Cool rooms and freezers
- Commercial kitchens
- Restaurants
- Catering facilities
- Bars and Clubs
- Food preparation floors
- Hospitals
- Catering facilities
- Chemical floors
- Chemical bunds
- Mining industry
- Containment bunds
- Mineral processing floors
- Treatment plants
- Waste treatment operations
- Extreme and high traffic floors
- Amenities
- Laundries
- Factories and warehouses

Direction

SUBSTRATE PREPARATION & APPLICATION

The requirements for preparing a concrete surface before applying 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. Apply well within the product's gel-time (pot-life)

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.

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 Clear or Tinted SHIMCOAT Polyurethane. 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.

ANIT-SLIP 9MM TOPPING

To achieve a final film thickness of 9mm 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 9mm, 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 these 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.


Mixing Epoxy Mortar

- **Coverage & Packaging**:
    - Coverage for Clear or Tinted Topcoat 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.
- **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 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

DISCLAIMER

Material Safety Data Sheet, Technical and Environmental Data Sheet can be provided upon request.
The information provided in this document is guidance only and considering the uses of this product are beyond the seller's control, the product is sold without guarantees or warranties. Warranties and guarantees shall be governed by SHIMICOAT Standard Terms of Sale. The purchaser shall make its own tests to determine the suitability for their specific application, and Shimicoat Pty Ltd is taking no responsibility for misuse of the product. The purchaser assumes all risk of use and handling of this product. This product will be happily replaced or credited back if defective. Beyond this, Shimicoat Pty Ltd is not liable for any damages caused by this product or its use.
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The customer is not released from the obligation to conduct careful inspection and testing of supplied goods.