Waterproofing of swimming pools

With Paint & Epoxy Coating

PCWC
THE ART OF BUILDING MATERIALS
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1. RELATED MATERIALS

PC-Sealcoat® EP SP

Two-component, epoxy protective coating for pools and concrete surfaces

PC-Sealcoat® EP SP is a high-performance, two-component, solvent-based epoxy coating specially formulated to provide a durable, protective, and decorative finish for swimming pools and a wide range of cementitious and metallic substrates.

PC-Prime® EP 2C WB

Two-component water-based epoxy primer for concrete surfaces

PC-Prime® EP 2C WB is a high-performance, two-component, water-based epoxy primer designed to enhance adhesion and improve substrate preparation for epoxy, polyurethane, and other coatings. It penetrates and seals mineral surfaces, creating a strong bond while improving surface strength and reducing absorbency.

PC-Conrend® HS RM

Polymer-modified, fiber-reinforced, repairing mortar

PC-Conrend®HS RM is a polymer and fiber-enhanced pre-mixed cement mortar, safe for interior and exterior use. It offers abrasion resistance, strong adhesion, and water impermeability, streamlining construction. Classified as PCC R3 type for concrete restoration, it meets EN 1504-3 standards (Certificate No. 2032-CPR-10.11).

PC-Conblend ® WP

Integral Waterproofing Liquid Admixture for Durable & Impermeable Concrete

PC-Conblend® WP is a high-performance integral waterproofing liquid admixture designed for use in concrete and mortar. It is added directly during the batching or mixing process to significantly reduce water penetration caused by capillary action and hydrostatic pressure in hardened concrete. By forming a dense and impermeable concrete matrix, PC-Conblend® WP enhances long-term durability and protects structures against moisture ingress. In addition to waterproofing performance, it improves workability and cohesion of fresh concrete and mortar without increasing water content, ensuring consistent quality and ease of placement on site.

2.CHARACTER OF THE ISSUE - REQUIREMENTS

A common and cost-effective method for finishing the surface of a swimming pool is to apply a specialized paint, such as an epoxy coating. This solution not only proves to be technically efficient but is also significantly more affordable than installing ceramic tiles.

The choice of epoxy coating has a substantial impact on the selection of waterproofing methods, as it imposes specific requirements that must be met. Consequently, the waterproofing layer applied beneath the epoxy paint must fulfill the following criteria:

Effective waterproofing capabilities.
Adequate elasticity, particularly at the pool's bottom, which experiences expansion and contraction stresses due to solar radiation when the pool is empty.
Strong adhesion to the substrate, along with resistance to potential negative pressure that may develop, for instance, when the pool is drained in the presence of a periodic or permanent water table in the surrounding area.

The epoxy coating itself should possess the following properties:
Sufficient elasticity to prevent cracking caused by potential expansion and contraction stresses.
Resistance to water and the chemicals used for pool water treatment (e.g., chlorine).
Durability against various weather conditions, such as solar radiation and frost.

3.SOLUTION

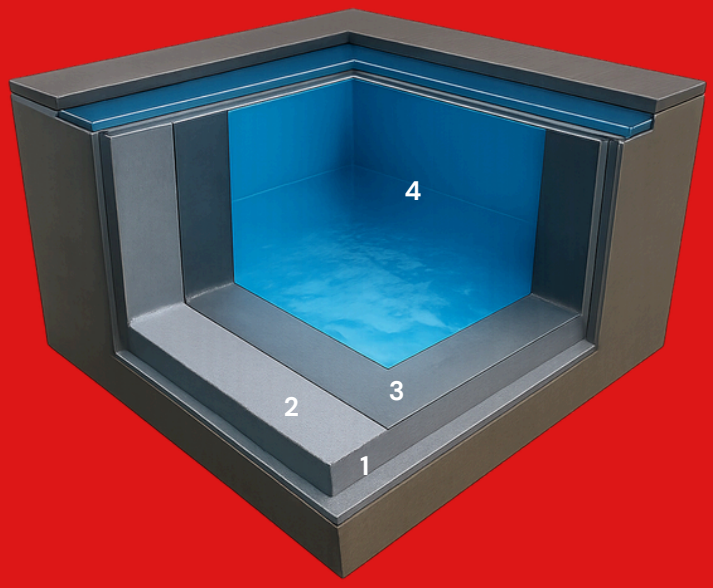
Accurately calculating the pool frame is crucial to ensure its ability to withstand hydrostatic pressure effectively. To meet the waterproofing requirements of the pool, we recommend applying **PC-Sealcoat® Elastic**, a highly flexible, two-component, brushable waterproofing slurry to the walls and bottom. The waterproofing layer created by **PC-Sealcoat® Elastic** offers several advantages:

Effective waterproofing
Strong adhesion to the substrate and high resistance
Exceptional elasticity
Long-lasting durability
Resistance to negative pressures, safeguarding the pool against leaks and water ingress

Additionally, during the concreting of the pool frame, it is advisable to incorporate **PC-Conblend® WP** waterproofing admixture into the concrete at a ratio of 0.2-0.5% of the cement weight.

To fulfill the requirements for elasticity and chemical resistance of the coating, the application of **PC-Sealcoat® EP SP** epoxy coating is recommended. This two-component epoxy system offers enhanced elasticity and resistance to friction, while also demonstrating robust resistance to various chemicals, including diluted acids, alkalis, petroleum products, certain solvents, water, seawater, and weathering.

WATERPROOFING OF SWIMMING POOLS AND PAINTING WITH EPOXY COATING



1. **Concrete**
2. **PC-Sealcoat® Elastic**
3. **PC-Prime® EP 2C WB**
4. **PC-Sealcoat® EP SP**

4.APPLICATION

4.1 PREPARATION OF THE SUBSTRATE

In case the pool frame has a smooth substrate
The substrate must be dry, with a moisture content of less than 4%, and free from loose particles, dust, grease, and other contaminants. Local restorations or repairs of roof elements, such as concrete and cement mortar, should be executed using polymer-modified, fiber-reinforced PCC R3 cement mortar, specifically **PC-Conrend® HS RM.**

If any concrete cracks are present, they should be cut into a V-shape, and **PC-Crack Seal® paste** should be applied. For structural cracks that could compromise the integrity of the overall structure, the PC-WC injection repair system should be utilized.

In instances where the pool frame is situated on an uneven substrate, it is essential to smooth the surfaces of the pool's walls and bottom using a robust cement mortar. The following workflow should be implemented:

Surface Preparation: Thoroughly clean the surface to remove any grease residues, formwork release agents, dust, loose materials, and other contaminants.

Cutting Starter Bars and Spacers : Trim the starter bars and spacers from the wall's surface as needed.

Cement Mortar Preparation: Prepare a strong cement mortar with a ratio of cement to sand at 1:2.5, incorporating **PC-Conbond® SBR Latex** at a rate of 1 kg per 25 kg of cement. This mixture will be applied to smooth the substrate along the pool's surface to a thickness of 2–3 cm.

Application of Bonding Layer: Apply a bonding layer (spatterdash) reinforced with **PC-Conbond® SBR Latex** polymer latex, using a mix ratio of cement, sand, **PC-Conbond® SBR Latex**, and water at 1:1:0.25:0.25, to the pool's walls. This step is crucial for enhancing the bond of the cement mortar.

Bottom Bonding Layer: Similarly, apply a bonding layer reinforced with **PC-Conbond® SBR Latex** polymer latex (mix ratio of 1:1:0.5:0.5) to the bottom of the pool, ensuring that this layer is applied fresh on fresh to strengthen the bond of the cement mortar.

Fillet Formation: At the juncture where the walls meet the bottom of the pool, as well as at the corners where the walls intersect, it is advisable to form a fillet during the application of the cement mortar. This will facilitate the subsequent application of epoxy products.

Surface Moisture Management: Ensure the surface is adequately dampened, avoiding the formation of water puddles.

4.1 WATERPROOFING WITH PC-SEALCOAT® ELASTIC

A minimum of 14 days should elapse after the application of the cement mortar to allow for proper hardening before applying **PC-Sealcoat® Elastic.** To prepare the mixture, combine the 27 kg box (Component B) of **PC-Sealcoat® Elastic** with 18 kg of liquid (Component A), stirring continuously until a uniform, viscous mixture suitable for brush application is achieved. A low-speed mixer (300 rpm) may be employed for this process.

The walls and bottom of the pool should receive 3 to 4 layers of **PC-Sealcoat® Elastic**. The final layer must be smoothed with a trowel while it is still fresh to ensure a polished finish. Each layer should be applied only after the previous one has dried, and to prevent cracking, the thickness of each layer should not exceed 1 mm. The total consumption is estimated at 1 to 1.5 kg/m^2.

At the intersections between the walls and the bottom of the pool, it is advisable to reinforce the **PC-Sealcoat® Elastic** with a polyester tape or fiberglass mesh tape approximately 10 cm wide. This reinforcing strip should be applied immediately after the first layer of **PC-Sealcoat® Elastic** is laid and while it is still fresh. Following the drying of this initial layer, 2 to 3 additional layers of **PC-Sealcoat® Elastic** should be applied.

4.2 PRIMING AND PAINTING WITH PC-SEALCOAT® EP SW EPOXY COATING

A minimum of 3 to 4 days after applying **PC-Sealcoat® Elastic**, and provided the surface is dry (moisture content below 4%), the bottom and walls of the pool must be primed with **PC-Prime® EP 2C WB**. Components A (resin) and B (hardener) are supplied in separate containers, maintaining the correct predetermined mixing ratio by weight. To prepare the mixture, add the entire contents of component B to component A. Mix the two components for approximately 5 minutes using a low-speed mixer (300 rpm). **PC-Prime® EP 2C WB** can be thinned with water by up to 30%. It is crucial to stir the mixture thoroughly, particularly near the sides and bottom of the container, to ensure uniform dispersion of the hardener. The estimated consumption of **PC-Prime® EP 2C WB** is approximately 200 g/m^2.

Once the primer has dried, it is essential to apply **PC-Sealcoat® EP SW** epoxy coating within 24 to 48 hours after priming. Similar to the primer, components A (resin) and B (hardener) are packaged separately, allowing for the correct mixing ratio by weight. Combine the entire contents of component B with component A and mix thoroughly for about 5 minutes at a low speed (300 rpm). Ensure to mix well near the sides and bottom of the container for uniform hardener dispersion. **PC-Sealcoat® EP SW** can be applied as is or thinned by up to 5% by weight with SM-27 special thinner. Application can be done using a brush, roller, or airless gun in two layers. The second layer should be applied after the first has dried but within 24 hours. The estimated consumption of **PC-Sealcoat® EP SW** is between 200 and 300 g/m^2 per layer.

5.ADVANTAGES OF WATERPROOFING AND EPOXY COATING

Structural Resilience: The flexible base layer adapts to temperature changes, allowing for substrate expansion and contraction when the pool is empty.

Negative Pressure Resistance: Strong adhesion to the pool structure resists negative hydrostatic pressure when drained near high water tables.

Superior Chemical & UV Resistance: The epoxy top coat protects against harsh chemicals and UV degradation.

Enhanced Aesthetics & Maintenance: Smooth, non-porous finish is gentle on skin and easy to clean.Algae resistance prevents dirt buildup.

Cost-Effectiveness: More affordable than ceramic tiles, with a waterproof life of 7–10 years with proper care.

Improved Safety: Slip-resistant additives increase traction in shallow areas.

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