TECHNONICOL






MANUAL

for cold applied polyurethane waterproofing systems

Areas of application – terraces & podiums, balconies, wet areas (toilets, bathrooms, kitchens), basements & retaining walls, bridge decks & underpasses, planters, swimming pools & water features, etc.

KNOWLEDGE. EXPERIENCE. CRAFTSMANSHIP.

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1.

Introduction

1. Introduction

Polyurethane waterproofing coating is a high-performance liquid-applied membrane made from pure polyurethane resins, designed to provide a seamless, durable, and elastomeric barrier against water infiltration.

Once applied, it cures by reacting with atmospheric moisture to form a flexible and continuous membrane that is highly resistant to temperature variations, chemicals, and physical wear. This makes it ideal for complex structures, horizontal and vertical surfaces, and areas prone to movement or cracking.

2.

Product portfolio

2. Product portfolio: polyurethane waterproofing solutions

A. Polyurethane waterproofing materials

2.1. TECHNONICOL ULTRATHANE

One component moisture curing liquid polyurethane membrane

TECHNONICOL ULTRATHANE is a one-component, moisture-curing, pure polyurethane liquid-applied membrane designed for long-lasting waterproofing. Once cured, it forms a seamless, elastic, and fully bonded coating without joints or overlaps.

The system has high tensile strength (≥ 4 MPa) and excellent adhesion to concrete (> 2.0 MPa), making it suitable for areas exposed to mechanical stress and movement. With elongation > 450%, it can easily bridge cracks and adapt to structural movements.

It is supplied in grey colour, and is applied by brush, roller, squeegee.

Area of application:

Roofs, terraces, and balconies, tanks, channels, pipelines, renewing old membranes, parking and sport areas, wet areas, bridge decks, overpasses, and podiums.

Coverage rate: ~ 1.6 kg/m^2 (2–3 coats) for ~1 mm DFT.

Note: Consumption varies with surface condition, porosity, climate, and application method. Use of TECHNONICOL GEO FABRIC increases material demand.

Technical characteristics:

Properties	Performance
Solid content EN ISO 3251 (%)	90 ±1
Curing at 20°C, 50% R.H.	- dry to the touch 12 hours - over coat application 24 hours - completely cured 7 days
Adhesion to concrete ASTM D 7234 (MPa)	> 2.0
Crack bridging ASTM D 7234 (mm)	> 2
Tensile strength ASTM D 412 (MPa)	≥ 4
Elongation at failure ASTM D 412 (%)	> 450

2.2. TECHNONICOL ULTRATHANE ECO

One component moisture curing liquid polyurethane membrane

TECHNONICOL ULTRATHANE ECO is a one-component, moisture-curing liquid waterproofing membrane made from pure polyurethane. After curing, it forms a continuous, seamless, and highly elastic coating without joints, overlaps, or the need for reinforcement mesh.

The system has a lower tensile strength (≥ 2 MPa) compared to TECHNONICOL ULTRATHANE but offers excellent adhesion to concrete (> 2.0 MPa). With elongation greater than 500%, it provides strong crack-bridging ability and easily adapts to structural movements, ensuring durable waterproofing performance even under dynamic conditions.

It is supplied in grey colour, and is applied by brush, roller, squeegee.

Area of application:

Roofs, terraces, and balconies, tanks, channels, pipelines, renewing old membranes, parking and sport areas, wet areas, bridge decks, overpasses, and podiums.

Coverage rate: ~ 1.6 kg/m^2 (2–3 coats) for ~1 mm DFT.

Note: Consumption varies with surface condition, porosity, climate, and application method. Use of TECHNONICOL GEO FABRIC increases material demand.

Technical characteristics:

Properties	Performance
Solid content EN ISO 3251 (%)	90 ±1
Curing at 20°C, 50% R.H.	- dry to the touch 12 hours - over coat application 24 hours - completely cured 7 days
Adhesion to concrete ASTM D 7234 (MPa)	> 2.0
Crack bridging ASTM C 836 (mm)	> 2
Tensile strength ASTM D 412	≥ 2
Elongation at failure ASTM D 412 (%)	> 500

B. Surface repairing materials

2.3. TECHNONICOL EPOXY PRIMER 021

Two component epoxy primer (base + hardener)

TECHNONICOL EPOXY PRIMER 021 is a two-component (base + hardener) surface preparation primer that improves bonding, waterproofing, and durability before coating. It is transparent, solvent-free, and rigid after curing. When the two parts are mixed, they react and form a strong, waterproof layer that sticks firmly to the surface and also provides excellent resistance to chemicals. It can be applied by brush, roller or spatula.

Area of application:

- It can be used on moist concrete (up to 5% moisture)
- It can be used as an inter-coat adhesion between topcoat and intermediate coat
- Exterior RCC surfaces include sloping roofs, masonry walls or facades.
- It is also utilized for waterproofing treatment at pipe penetration areas.

Consumption:

- 200–250 g/m^2 for standard applications
- Allow 6–8 hours drying time.
- The next layer must be applied within 24 hours after the primer is used.

Technical characteristics:

Properties	Performance
Application Method:	Brush or roller
Pot Life (100 g mix)	25–30 min at 25°C, 15–20 min at 35°C
Overlay Time (Max)	24 hours
Curing Time:	6-8 hours
Application Temperature	5°C to 35°C
Colour	Transparent finish

2.4. TECHNONICOL SBR Latex

Latex based polymer for waterproofing, repair & rendering

TECHNONICOL SBR Latex a single-component liquid chemical (polymer) is a cement additive that improves bonding, waterproofing, and durability. When added in cement, it makes the cement stronger, flexible, waterproof, and long-lasting. It also helps the cement stick better to surfaces and prevents water from passing through. For making high performance polymer-modified mortar, it is usually added in the ratio of 10% of the cement weight.

Key properties:

- Bond coats as a primer for concrete repair
- Mortar modification for repair renders
- Improves adhesion to concrete, masonry, and steel reinforcement
- Enhances flexural and tensile strength, reducing cracking

Area of application:

Waterproofing of terraces, sunken slabs, basements, retaining walls, water tanks, balconies, lift pits, and RCC roofs, etc.

Mixing:

- For bond coat, mix 1:1 TECHNONICOL SBR Latex and cement and apply on a clean surface.
- For polymer-modified mortar, add 10% TECHNONICOL SBR Latex of cement weight.

Technical characteristics:

Properties	Performance
Specific Gravity	1.01 ± 0.02
Chemical Resistance	Resistance to mild, acids, sulphates, alkalis
Bond Strength, N/mm^2	> 3
Flexural strength at 28 days, N/mm^2	> 7

Packaging:

20 Kg, 50 Kg

(SBR) Styrene–Butadiene Rubber

2.5. TECHNONICOL ULTRACEM REPAIR MC

Polymer modified high strength micro concrete

TECHNONICOL ULTRACEM REPAIR MC is a single-component, cement-based, high-strength, polymer-modified mortar used for repairing broken or damaged concrete. It is a ready-to-use material made of cement, fine sand, and special additives. After mixing with water, it becomes a strong, durable, and easy-to-apply mortar.

The material can be applied in thicknesses of up to 100 mm in one layer using a trowel, by hand, or with a pump. For deeper repairs, additional thickness can be achieved by applying it in multiple layers.

Area of application:

- Jacketing of beams/columns
- Filling core pipe penetrations, tie-rod holes, honeycombed concrete
- Structural repair and strengthening of damaged concrete elements
- Suitable for vertical, horizontal, and overhead applications

Mixing:

- Flowable mix: 3.50–4.50 L water per 25 kg
- Plastic mix: 3.00–3.75 L water per 25 kg
- Adjust water as needed for temperature and site conditions; trial batches recommended

Technical characteristics:

Properties	Performance
Compressive Strength, N/mm² (Typical) at 27 °C, as per IS 4031	Free flowing mix (W/P= 0.16),
1 day, N/mm²	> 15
7 days, N/mm²	> 45
28 days, N/mm²	> 60
28 days Comp. Strength, Blended with 50% of 10 mm aggregate, N/mm² (Typical)at 27 °C	> 63

Packaging:

Supplied in 25 kg HDPE bags

(MC) Micro-Concrete

2.6. TECHNONICOL ULTRACEM REPAIR PMC

Polymer modified cementitious fibre reinforced repair mortar

TECHNONICOL ULTRACEM REPAIR PMC is a ready-to-use repair mortar made with cement, polymers, and special fibres. These materials make it strong, durable, and resistant to corrosion, shrinkage cracks, and damage from carbonation. It is used for both structural and surface (cosmetic) repairs of concrete.

The mortar can be applied in 10–50 mm thickness on vertical surfaces and 25–30 mm thickness on overhead surfaces, using a trowel by hand or a mortar spray machine.

Area of application:

- Making Corner Fillets, Repair of Honeycombed Concrete Areas.
- Restoration of damaged or deteriorated concrete

Mixing:

For 25 kg powder pack, place about 3.5-4 liters fresh water in the mixer and add the total quantity of powder and mix with mechanical mixer in operation for 1 – 2 minutes.

Technical characteristics:

Properties	Performance
Appearance	Free-flowing grey powder
Compressive Strength (N/mm^2 @ 27°C, W/P = 0.15)	1 day: > 18 3 days: > 35 7 days: > 50 28 days: > 60
Flexural Strength (28 days), N/mm^2	> 10
Tensile Strength (28 days), N/mm^2	> 5
Bond Strength (28 days), N/mm^2	> 15
Pot Life (27°C), minutes	> 30

Packaging:

Supplied in 25 kg HDPE bags

(PMC) Polymer Modified Mortar

2.7. SUMMARY COMPARISON TABLE

ULTRACEM Repair MC / ULTRACEM Repair PMC

Feature	ULTRACEM Repair MC (Microconcrete)	ULTRACEM Repair PMC (Polymer Modified Mortar)
Form	Flowable, pourable micro-concrete	Thixotropic, trowel-applied mortar
Placement	Poured/pumped into formwork, voids	Applied directly on surface (no formwork needed)
Application thickness	20–100 mm per pour (extendable with aggregate)	10–50 mm vertical, 25–30 mm overhead per layer
Best for	Structural jacketing, void filling, honeycombs	Surface patch repairs, spalled concrete
Consistency	Free flowing/self-levelling	Non-sagging, workable mortar
Key advantage	Excellent for large, inaccessible areas	Excellent adhesion, crack resistance, durability

2.8. TECHNONICOL TECHNO-MIX WL

Integral waterproofing compound for concrete and plaster

TECHNONICOL TECHNO-MIX WL is a special liquid integral compound added to concrete or plaster to make them waterproof. It is chloride-free and comes as a brown liquid.

When mixed with cement, it reacts inside the concrete to form a water-repelling layer. This layer blocks water from entering through small pores and capillaries, reducing water absorption and leakage.

Area of application:

- Basements, roofs, water tanks, and other structure where protection from water is important.
- Excellent for internal and external plaster of buildings etc.

Mixing:

100 g per 50 kg of cement (max. 0.2% by weight of cement).

Technical characteristics:

Properties	Performance
Appearance:	Brown liquid
Specific Gravity (25°C)	1.06 ± 0.02 g/ml
pH Value	≥ 7
Chloride Content (BS 5075 Part 1)	Nil
Recommended Dosage	100 g per 50 kg of cement (max. 0.2% by weight of cement)

Packaging:

Available in 200 ml, 1 L, 5 L, 10 L, 20 L, and 100 L containers.

Bengaluru International Airport Limited - BIAL
Bangaluru, India

Navi Mumbai International LTD
Mumbai, India

Adler Railway Station
Adler, Russia

3.

Equipment

3. Standard equipment's used for TECHNONICOL ULTRATHANE/ ULTRATHANE ECO waterproofing

1. Mixing equipment

- Slow-speed mechanical mixer - use a slow-speed mechanical mixer (300–500 RPM).
- The mixer helps to homogenize the material before application, which is critical for achieving proper performance and durability without creating air bubbles.

2. Application tools

- High-quality paint rollers (solvent-resistant, medium to long nap)
- Brushes (for detailing, corners, and edges)
- Steel trowel (for reinforced detailing with geo fabric)

3. Surface preparation tools

- Mechanical grinder (for removing laitance, dirt, or weak layers)
- Wire brush / Hand scraper (for small surface preparation tasks)
- Industrial vacuum cleaner (to ensure a dust-free substrate before application)

4. Moisture testing tools

- Moisture meter (to confirm substrate moisture level is below 5%)

5. Thickness measurement tools

- Wet film thickness gauge (to monitor film thickness during application)
- Dry film thickness (DFT) Gauge / Elcometer (to verify final dry thickness after curing)

6. Reinforcement tools (if GEO Fabric is used)

- Scissors or cutter (for cutting TECHNONICOL GEO Fabric to size)
- Roller or Spatula (to embed fabric evenly without air pockets)

7. Cleaning materials

- Xylene or appropriate PU cleaner (for cleaning tools and spills)
- Lint-free cloths (for surface wiping before priming or recoating)

8. Personal protective equipment (PPE)

- Nitrile gloves
- Safety goggles
- Protective clothing
- Organic vapor respirator mask (when working in enclosed areas)

4.

Storage conditions

4. Material storage conditions

(For liquid-applied polyurethane coating)

- **Storage temperature:**

Store between +5°C and +35°C. Avoid exposure to direct sunlight, frost, or excessive heat, as this can compromise product quality.

- **Storage area:**

Keep barrels in a dry, well-ventilated, and shaded area, protected from rain, moisture, and ignition sources.

- **Stacking limit:**

Do not stack more than two barrels high to prevent deformation or leakage. Always place barrels on a flat, stable surface or pallet.

- **Barrel positioning:**

Store TECHNONICOL ULTRATHANE barrels in an upright position with lids tightly sealed to prevent contamination and curing of the material.

- **Shelf life:**

The typical shelf life is 12 months from the date of manufacture when stored in original, unopened packaging under recommended conditions.

- **Handling precaution:**

Avoid opening barrels unnecessarily. After partial use, reseal tightly and consume remaining material as soon as possible to prevent moisture ingress and premature curing.

- **Do not store nearby:**
  - Open flames or sparks
  - Inorganic acids or oxidizing agents
  - Food or drinking water supplies

5.

Surface preparations

5. Surface preparation guidelines

Proper substrate preparation is critical to the success of any waterproofing system.

5.1. Grinding and chipping

Remove laitance and loose particles.

- **Grinding:**

A mechanical surface preparation method using rotary grinders to remove laitance, smooth surface irregularities, and expose sound concrete.

- **Chipping:**

A manual or mechanical process using chisels or chipping hammers to break and remove loose, damaged, or weak concrete.

Both processes are essential for achieving a clean and profiled substrate before waterproofing.

Ensures the surface is free from oils, grease, curing compounds, and any flaky concrete.

Enhances surface roughness for better adhesion of waterproofing systems.

Provides a mechanical key for bonding between substrate and waterproofing layer.

Proper surface preparation increases durability and service life of the waterproofing system.

The final prepared surface must be structurally sound, completely dry, and free from any loosely adhered particles or contaminants.

5.2. Groove cutting

Crack treatment using polymer modified mortar

- Groove cutting is the process of creating a controlled cut (usually 10 mm wide × 10 mm deep) along visible cracks in concrete or plastered surfaces. Typically done using a mechanical cutter or angle grinder with a diamond blade. Purpose is to expose the full depth of the crack and provide space for proper filling with repair material.
- Grooves are cut in 'V' or 'U' shape depending on the repair requirements.
- Helps in achieving better mechanical anchorage and bonding for the crack filler.
- Surface inside the groove must be cleaned thoroughly using air or brush to remove dust, laitance, and debris.
- The cleaned groove is filled with polymer modified mortar (PMM), which offers enhanced flexibility, adhesion, and waterproofing properties.
- PMM helps accommodate minor future movements and prevents water ingress through treated cracks.
- Proper curing of the filled groove is essential before applying the final waterproofing layer.
- Groove cutting is a standard practice in surface preparation to ensure long-term waterproofing performance over cracked areas.

- Open all visible cracks by cutting a groove 10 mm wide and 10 mm deep using a hand-held angle grinder equipped with a diamond blade.

- Apply TECHNONICOL SBR Latex bond coat prepared by mixing 1-part TECHNONICOL SBR Latex and 1 part cement (by weight) inside the cleaned grooves using a brush to ensure proper adhesion of the subsequent Polymer Modified Mortar (PMM).

- Fill the grooves completely with Polymer Modified Mortar (PMM) prepared by mixing 1-part cement, 3 parts sand, and 10% TECHNONICOL SBR Latex bonding agent (by weight of cement). Finish the surface smoothly, ensuring proper compaction and strong bonding with the substrate.

- After 15-20 minutes of repair, apply one coat of TECHNONICOL SBR Latex over the patched area to enhance bonding with the upcoming waterproofing layer.

5.3. Angle fillet
(50 × 50 mm) at floor-wall junction with polymer modified mortar

What is an angle fillet?

- An angle fillet is a triangular or curved coving made at the junction between horizontal (floor) and vertical (wall) surfaces.
- It eliminates the sharp 90° angle at the junction, allowing seamless transition for waterproofing membranes or coatings.
- Usually constructed using a mortar mix or polymer-modified mortar (PMM).

Why is angle fillet important in waterproofing?

- Removes sharp internal corners where waterproofing membranes often fail due to stress concentration.
- Improves membrane adhesion by allowing smooth turns without wrinkling or bridging.
- Reduces risk of leakage at vulnerable floor-wall junctions.
- Provides structural support to waterproofing materials, preventing cracks and edge lifting.
- Ensures continuity and uniform thickness of waterproofing layers.

- Apply a bond coat made of 1-part TECHNONICOL SBR Latex and 1 part cement (by weight) at the floor-wall junction before placing the Polymer Modified Mortar for angle fillet formation. This ensures enhanced adhesion between the substrate and the fillet mortar.

- Form a 50 mm × 50 mm angle fillet at the floor-wall junction using (PMM) prepared with 1 part cement, 3 parts sand, and 10% TECHNONICOL SBR Latex (by weight of cement). Shape the fillet with a trowel and ensure smooth finishing, proper compaction, and full contact with the bond coat.

- Apply a bond coat consisting of 1-part TECHNONICOL SBR Latex and 1 part cement (by weight) above the cured angle fillet using a brush. This enhances adhesion between the fillet and the subsequent waterproofing layer.

5.4. Metal protrusions

Sealing around embedded items

Metal protrusions include embedded elements like pipes, anchors, rods, bolts, conduits, sleeves, etc., that pass through or emerge from concrete surfaces. These are critical penetration points that are highly prone to leakage and must be treated carefully during waterproofing.

Purpose and benefits

- Provides watertight sealing around high-risk penetration points.
- Prevents water ingress through shrinkage cracks, gaps, or poor bonding at metal-concrete interfaces.
- Enhances durability and bond strength using TECHNONICOL SBR Latex-modified mortar.
- Ensures compatibility and continuity with the waterproofing system applied over it.

Treatment method

- Clean the surface around the embedded metal item thoroughly to remove dust, rust, oil, or laitance.
- Apply a bond coat of 1-Part TECHNONICOL SBR Latex + 1 part cement (by weight) around the base of the protrusion.

- Prepare PMM using: 1 part cement, 3 parts well-graded sand and 10% TECHNONICOL SBR Latex (by weight of cement).
- Pack and seal the area around the metal item with the PMM, ensuring full coverage and tight compaction.

- Finish the surface smoothly with a trowel and ensure no voids or gaps remain.
- Allow curing as per site conditions before proceeding with the final waterproofing layer.

5.5. Repair of pinholes and potholes

Using polymer modified mortar

During surface preparation, if pinholes, honeycombs, or potholes are observed in concrete substrates, they must be repaired before waterproofing application.

Pinholes

- Tiny, shallow surface voids usually caused by trapped air during concrete placement or poor surface finishing.
- Typically, less than 5 mm in diameter.
- Often found in polyurethane coatings, screeds, or surface mortars.

Potholes

- Larger, deeper surface voids or cavities resulting from poor compaction, honeycombing, or degradation.
- Can range from 10 mm to several centimetres in diameter and depth.
- Often occur due to improper concrete placement, segregation, or rebar corrosion.

Importance of repair

- Ensures a uniform and sound substrate for waterproofing.
- Eliminates potential leakage points.
- Enhances adhesion and performance of waterproofing membranes.
- Prevents long-term deterioration due to moisture ingress.

Repair procedure

- Inspect and identify all pinholes and potholes on the concrete surface before waterproofing.

- Clean the defective area thoroughly to remove dust, laitance, loose material, and contaminants.
- Pre-wet the area with clean water to reach saturated surface dry (SSD) condition.
- Apply a bond coat using a mix of 1-part TECHNONICOL SBR Latex and 1 part cement (by weight).
- Prepare PMM using: 1 part cement, 3 parts well-graded sand and 10% TECHNONICOL SBR Latex (by weight of cement). Fill the defects completely using PMM
- For pinholes: use a putty knife or brush.
- For potholes: use a trowel and ensure proper compaction to avoid air entrapment.
- Finish the surface smoothly, flush with the surrounding area.
- Allow to cure adequately before applying any waterproofing membrane or coating.

6.

Construction joint treatment

6. Construction joint treatment

A construction joint is a planned discontinuity or break in a concrete structure that occurs when a portion of the concrete is poured at one time, and the remaining portion is poured later. It is intentionally created to allow for the continuation of work without compromising the structural integrity of the element.

Where construction joints are found:

- Slab-to-slab joints (horizontal)
- Wall-to-wall or wall-to-slab interfaces (vertical/horizontal)
- Lift pits, water tanks, basements, podiums, and retaining walls

1. Chasing of joints

Chase and open all construction joints in a "V"-shaped groove with dimensions 25 mm (width) x 25 mm (depth) using appropriate mechanical tools.

2. Surface cleaning

Thoroughly clean the grooves to remove all dust, loose particles, and laitance using a wire brush and compressed air or vacuum.

3. Filling of grooves

Fill the prepared grooves with a Polymer-Modified Mortar consisting of:

- 1 part cement
- 3 parts clean, well-graded sand
- 10% TECHNONICOL SBR Latex (by weight of cement) as a bonding agent.

Chase and open all construction joints in a "V"- Shaped groove with dimensions of 25mm (width) x 25mm (depth) using mechanical tools and same shall be filled with polymer modified mortar

TYPICAL SECTION - CONSTRUCTION JOINT GROOVE OPENING

7.

Pipe penetration treatment

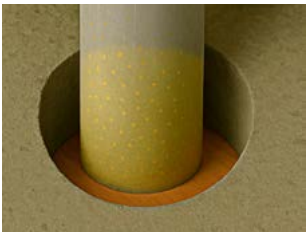
7. Pipe penetration treatment

Special attention is given to pipe entries, a common leakage point.

Step-by-step treatment

- STEP 1

Pre-concreting: Plywood shuttering is typically installed from the underside before concrete filling to provide support and shape to the concrete structure, ensuring a smooth finish and accurate dimensions.



- STEP 2

Pre-concreting: Apply TN Epoxy Primer 021 on the PVC pipe, immediately sprinkle coarse sand, and cure for 24 hours.

- STEP 3

TN Ultracem Repair Micro Concrete Filling: After the TN Epoxy Primer 021 has fully cured, fill the core area with TN Ultracem Repair MC around the annular space of pipes.

- STEP 4

During final finishing of Micro-concrete, leave a 10 mm deep groove along the repair edge.

- STEP 5

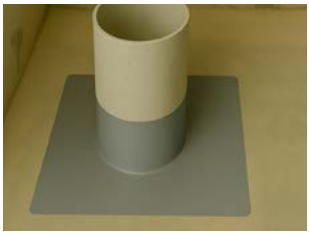
Groove sealing: After 24 hours of air curing, fill the groove with TN PU sealant or Epoxy mortar for sealing to ensure long-term watertightness and durability.

- STEP 6

After 24 hours of TECHNONICOL Micro-concrete filling, de-shutter the cores from the underside and repair the annular spaces around pipes with micro-concrete or TECHNONICOL SBR Latex polymer modified mortar.

- STEP 7

Fabric fixation: Clean the surface around pipe penetrations and fix 45 GSM Fabric with a 50-100mm width extension around the pipes, as per the reference picture.



- STEP 8

Coating & flashing: Apply TECHNONICOL ULTRATHANE / ULTRATHANE ECO coating in minimum 2 layers around the pipes, ensuring the fabric is properly embedded, at the required consumption rate.

8.

Pre-application testing

8. Pre-application testing

Conduct a pre-ponding test to identify any visible or hidden cracks and potential leakage zones especially around pipe penetrations, slab joints, and floor-wall junctions.

This process is crucial for two main reasons:

- It helps detect and address substrate defects before waterproofing begins.
- It verifies the structural integrity of the surface and confirms the readiness of the slab for further treatment.

Important Note: After the test, ensure that the surface is completely dry before proceeding with epoxy primer application, as residual moisture can negatively affect bonding and long-term performance of the polyurethane system.

9.

Material mixing procedure

9. Material mixing procedure

9.1. TECHNONICOL EPOXY PRIMER 021

Step-by-step mixing instructions

- Measure the components accurately in the ratio of 3 parts Base : 2 parts Hardener by weight.
- Pour both components into a clean mixing container.
- Mix thoroughly using a slow-speed mechanical stirrer (avoid high-speed mixing to prevent air entrainment) until the blend is completely uniform in colour and consistency.

- Prepare only the quantity of material that can be applied within the specified pot life:
  - 25-30 minutes at 25°C
  - 15-20 minutes at 35°C

9.2. TECHNONICOL ULTRATHANE / ULTRATHANE ECO

TECHNONICOL ULTRATHANE / ULTRATHANE ECO is a one-component, moisture-curing polyurethane waterproofing material.

- Supplied in 25 kg bucket packing for ease of handling and application.
- Although it is a single-component product, thorough mechanical mixing is required before use to ensure uniform consistency and performance.

Mixing Guidelines :

- Mix with a slow-speed stirrer or drill (<300 RPM) to avoid air entrapment.
- Stir for 3–5 minutes until smooth and uniform.
- Use a clean, dry container to avoid contamination.
- Do not use high-speed mixers (can cause bubbles/ foaming).

9.3. TECHNONICOL SBR LATEX

Recommended uses & mixing guidelines

1. Bond coat:

- Take 1-part TECHNONICOL SBR Latex and 1 part cement in (1:1 ratio).
- Manually mix with a trowel or use a mechanical stirrer until smooth and lump-free.
- Apply immediately on a clean, roughened surface.
- Apply the next layer while the coat is still tacky.

2. Polymer-modified mortar:

- Take cement and sand in (1:3 ratio) 1 part cement, 3 part sand.
- Add TECHNONICOL SBR Latex equal to 10% of cement weight.
- Mix manually until a creamy, workable mortar is formed.
- Use immediately for plastering or repairs.

9.4. TECHNONICOL ULTRACEM REPAIR MC

Recommended uses & mixing guidelines

- Flowable mix: 3.50 - 4.50 L water per 25 kg
- Plastic mix: 3.00 - 3.75 L water per 25 kg
- Use a slow-speed (250 - 350 rpm) mechanical stirrer for best results.
- Add the TECHNONICOL Ultracem Micro-concrete slowly into the recommended volume of clean water while mixing.
- Mix for about 5 minutes until homogeneous; hand mixing is not recommended.

9.5. TECHNONICOL ULTRACEM REPAIR PMC

Recommended uses & mixing guidelines

- For a 25 kg bag, add 3.5 - 4 litres of fresh water to a mixing vessel
- Slowly add the powder while mixing mechanical stirrer for 1–2 minutes until uniform
- Slight water adjustments may be made based on ambient temperature and desired consistency

9.6. TECHNONICOL TECHNO-MIX WL

Recommended uses & mixing guidelines

Dosage:

- 100 g of additive per 50 kg of cement (max. 0.2% by weight of cement).

Method:

- Take the required amount of cement.
- Add the Techno-Mix WL integral compound (100 g per 50 kg cement).
- Mix thoroughly with water and aggregates as per the mix design until a uniform, lump-free mixture is achieved.
- Use the mix immediately for casting or plastering.

10.

Application process

10. Application process of polyurethane waterproofing

10.1. Moisture check before primer application

- Excess moisture can inhibit primer adhesion, cause blistering or delamination, and compromise the long-term performance of the waterproofing system.
- Always check the moisture content of the substrate before starting primer or coating application.
- Use a moisture meter to ensure the surface is dry and suitable for coating.

- Moisture content must be less than 5% before proceeding, to ensure proper adhesion and performance of the system.

10.2. Surface temperature check before primer application

It is essential to check the surface temperature before applying TECHNONICOL Epoxy Primer 021, as temperature directly affects the curing time, adhesion, and performance of the primer.

- Check surface temperature before applying TECHNONICOL Epoxy Primer.
- The recommended application temperature is between 5°C and 35°C.
- Avoid application outside this range to ensure proper curing and adhesion.

10.3. Ambient humidity check before primer application

Before applying TECHNONICOL Epoxy Primer, it is crucial to measure the relative humidity of the ambient air, as it directly influences curing behavior and adhesion.

- Measure the relative humidity of the ambient air before starting primer application.
- Ensure humidity is below 85%, as higher levels may affect adhesion and curing of the coating.

10.4. Application of TECHNONICOL Epoxy Primer 021

TECHNONICOL Epoxy primer 021 is a two-component resin-based coating used as the first layer in waterproofing, flooring, and protective coating systems. It plays a crucial role in surface preparation by ensuring strong adhesion between the substrate (like concrete) and the next layer of the system, such as polyurethane or epoxy coatings.

- Apply the primer to the prepared surface using a roller only.
- Ensure even coverage at a rate of 200-250 g/m^2 or 4–5 m^2/kg per coat.
- Allow the primer to dry fully before proceeding with the next layer.
- Metal coins shall be fixed above primer at specified intervals to check the DFT of applied polyurethane coating with elcometer by non-destructive method.

Sprinkling of quartz sand on wet primer:

Broadcasting dry quartz sand onto freshly applied primer is optional and can enhance mechanical interlocking and adhesion of subsequent waterproofing layers. The next layer of polyurethane coat must be applied within 24 hours to ensure optimal bonding and performance.

Dry film thickness (DFT) check using elcometer:

Verify that the applied Technonicol Ultrathane / Ultrathane ECO coating meets the specified DFT. Place metal coins at selected test locations on the primed substrate, apply the polyurethane coating over the coins, allow it to fully cure, and then measure the DFT using an elcometer. Take readings at multiple points to confirm compliance with the minimum required thickness.

10.5. Application procedure - TECHNONICOL ULTRATHANE / ULTRATHANE ECO

1. Apply TECHNONICOL ULTRATHANE / ULTRATHANE ECO polyurethane waterproofing coating by brush, roller or spatula in 2-3 alternative coats at a total consumption of 1.6 kg/m^2 to achieve an overall dry film thickness of approximately 1.0 mm.
2. Wait 24 hours after the first coat before applying the second coat.
3. Ensure the second coat is applied within 48 hours of the first coat.
4. The surface must remain clean, dry, and free from dust or moisture between coats to ensure proper adhesion.

5. For reinforced systems, a minimum 200 mm wide strip of geotextile fabric polyester (40–60 GSM) can be placed at junctions to enhance strength and provide reinforcement between polyurethane coating layers. Its use is optional but recommended in areas prone to stress or movement.
   - **Improved crack resistance:** Reduces the risk of cracks forming in the coating.
   - **Better load distribution:** Helps distribute stresses evenly across the coated surface.
   - **Durability:** Increases the lifespan of the waterproofing system.
   - **Optional flexibility:** Can be used only where extra reinforcement is needed, keeping material usage efficient.

6. Actual consumption may vary depending on surface porosity, substrate condition, ambient temperature, humidity, and application method.

7. During application, trapped air or bubbles may form in the coating. Use a spike roller immediately to release air and ensure a smooth, bubble-free finish.

10.6. Purpose of spike roller

Why is a spike roller used during TECHNONICOL ULTRATHANE / ULTRATHANE ECO application?

- Air can get trapped in the coating during mixing or rolling, and additionally, bubbles may form as a result of the polymerization process when the PU reacts with atmospheric moisture. If not removed, these bubbles can cause pinholes, weak bonding, or a porous coating.

- During application, if air bubbles or entrapped air are observed, a spike roller should be used immediately. It helps release trapped air, ensuring a smooth, bubble-free finish and proper adhesion. To minimize bubble formation, apply the coating in thin layers, as thick layers prevent air escape and can lead to a porous, compromised membrane. Use the spike roller gently and uniformly to avoid disturbing the applied coating thickness.

10.7. Termination in polyurethane coating systems

Why is termination necessary?

Termination is done to secure the edge of the waterproofing membrane and protect it from failure due to environmental or structural factors.

- Always terminate TECHNONICOL ULTRATHANE / ULTRATHANE ECO at a minimum height of 300 mm on vertical surfaces (or as per project specifications).
- The coating must be terminated into a 10 mm × 10 mm groove (chase cut) at the termination line.
- This groove ensures mechanical anchoring of the membrane and prevents edge lifting or peeling over time.
- After the coating application, the groove should be sealed using PMM, PU sealant, or epoxy putty to ensure a watertight finish.
- Use masking tape during application to achieve a neat, clean termination line.

10.8. Wet film thickness (WFT) check

Wet Film Thickness (WFT) checks are done to ensure the coating is applied correctly — at the right thickness — while it's still wet. This is critical for achieving the designed Dry Film Thickness (DFT) after curing.

- Check the WFT of both the 1st and 2nd coats using a wet film thickness gauge immediately after application.

- This ensures the coating is applied at the specified thickness, achieving the required Dry Film Thickness (DFT) after curing.
- Perform checks at multiple locations to ensure uniformity across the surface.

10.9. Dry film thickness (DFT) check

- After completing both coats of TECHNONICOL Ultrathane/ Ultrathane ECO, perform a DFT test to verify the final film thickness.
- Use a vernier calliper (on test patches) or electronic DFT gauge suitable for polyurethane coatings.
- Ensure the achieved DFT meets the specified system requirement for durability and performance.
- Take readings at multiple points to confirm uniform application.

10.10. Dry film thickness (DFT) check using elcometer

To ensure the performance and durability of the TECHNONICOL ULTRATHANE / ULTRATHANE ECO waterproofing system, it is essential to verify that the applied coating achieves the specified dry film thickness (DFT).

DFT measurement procedure using elcometer:

- Prior to spray application, place metal coins on the substrate surface at selected test locations.
- These serve as a reference point, allowing accurate measurement without damaging the membrane.
- Apply the polyurethane coating system as per the standard procedure, ensuring full coverage over the embedded coins.
- After the coating has fully cured, place the probe of the Elcometer directly above the coin.
- The device will record the thickness of the coating in millimetres.
- Record the readings at multiple locations and compare them with the specified minimum required thickness (e.g., 1.0 mm).
- If thickness is found to be insufficient, recoat the area as per standard guidelines.

Purpose:

Ensures compliance with design specifications.

Verifies uniformity of application.

Note: Always follow the manufacturer's calibration and handling procedures when using the Elcometer or equivalent thickness gauges.

10.11. Coating Curing

Curing is the process that allows the polyurethane coating to fully react and harden, forming a durable, waterproof, and chemical-resistant membrane. TECHNONICOL ULTRATHANE / ULTRATHANE ECO is a cold-applied, air-curing system, which means it cures naturally upon exposure to ambient air and humidity—without the need for heat or special equipment. After application, the coating should be allowed to self-cure for a minimum of 7 days under normal environmental conditions.

During this period, it's essential to protect the surface from water, dust, debris, and mechanical damage, as any interference may compromise the membrane's performance. Since curing is air-dependent, factors such as temperature, humidity, and ventilation play a critical role in achieving full film formation and strength.

TECHNONICOL ULTRATHANE/ ULTRATHANE ECO coating should not be covered, flooded, or overlaid with screed, tiles, or other materials until full curing is complete, to prevent blistering, delamination, or other failures related to trapped moisture or incomplete polymerization.

Standard polyurethane coatings are not UV-resistant unless specifically formulated. If exposed to sunlight, the cured coating must be protected using a suitable top layer, such as screed, tiles, or other protective finishes, to prevent degradation from UV radiation.

11.

Final testing & protection

11. Final testing & protection

11.1. Water post pond test

Why is a water pond test done?

Because it's the most reliable way to confirm that the waterproofing system is 100% watertight before covering it.

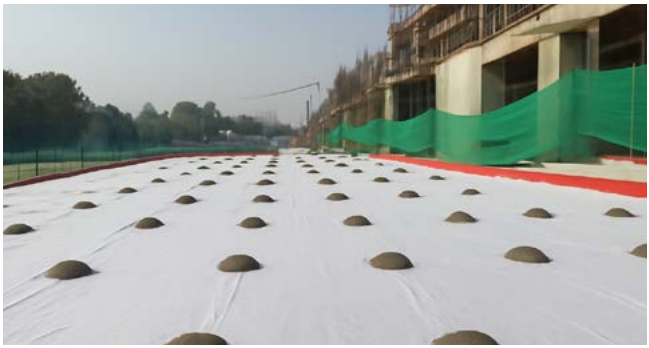
- Conduct a water pond test to verify the effectiveness and integrity of the applied polyurethane waterproofing system.
- Fill the treated area with clean water up to 50 mm height above the finished coating level.
- Maintain the ponding condition for a minimum duration of 48-72 hours without interruption.
- The test should be carried out after 7 days of final coat application, depending on ambient temperature and curing conditions.
- Ensure there is no leakage, dampness, or seepage observed during or after the test.
- Record and document test results before proceeding with any protective layers or tile fixing.

11.2. Separation layer

Why is a separation layer used?

The non-woven geotextile separation layer is placed over the cured TECHNONICOL ULTRATHANE / ULTRATHANE ECO waterproofing membrane to serve as a protective and functional buffer between the membrane and the overlying cement-sand screed.

- Place 100-300 GSM non-woven geotextile fabric over the fully cured waterproofing layer to act as a separation and protection barrier.
- Ensure the geotextile covers the entire area without wrinkles or folds, with proper overlaps at joints (typically 50–100 mm).
- Over the geotextile, apply a protective cement-sand screed (usually 50–75 mm thick), with: Proper slope (typically 1:100) for effective drainage.
- Levelling pads or reference points to maintain uniform screed thickness.
- Cure the screed as required before allowing foot traffic or tiling.



11.3. Protective screed on horizontal surface

Laying of protective and slope making concrete screed of average 75 mm thick. Concrete screed shall be laid in slope of 1:100 as indicated on drawing or as approved, maintaining the thickness of minimum 50 mm at pipe outlets / drainage points and shall be well compacted, levelled, finished and cured for min 7 days by ponding with water.

11.4. Protective plastering on vertical surface

- Apply a 10–12 mm thick protective plaster over vertical surfaces treated with waterproofing.
- Prepare a cement–sand mortar in the ratio of 1:4 (1 part cement: 4 parts sand) and add TECHNONICOL TECHNO-MIX WL waterproofing integral compound at a dosage of 100 g per 50 kg bag of cement. The mix should be uniform, with good workability and excellent adhesion.
- To enhance bonding between the polyurethane coating and the plaster, sprinkle dry quartz sand onto the 2nd coat of PU layer before it cures.
- Ensure the surface is evenly finished, free from cracks or voids.
- The plaster acts as a protective barrier against mechanical damage, UV exposure, and weathering.
- Cure the plaster adequately to achieve the desired strength and durability.

11.5. Screed curing

Curing is essential to allow the cement-sand screed to gain its full strength and durability. Without proper curing, the screed can become weak, brittle, or cracked.

- Cure the screed by ponding with clean water for a minimum of 7 days to achieve proper strength and durability.
- Ensure continuous water coverage during the curing period to prevent surface cracks and shrinkage.
- Protect the area from foot traffic or load during curing.

11.6. Saw cutting in protection screed

Saw cutting is performed to control cracking in the screed due to thermal expansion, shrinkage, and structural movement.

- Perform saw cutting of the protection screed within 48 hours of concreting, once the initial setting has occurred but before full curing. This forms control joints that help prevent random shrinkage cracks during hardening. Cutting within this period ensures the concrete is strong enough to avoid edge breakage, yet soft enough for clean, precise cuts. After groove cutting, the concrete should undergo minimum 7 days of proper ponding with clean water to achieve optimal strength and durability.
- Cut grooves of 5 mm (wide) × 20 mm (deep) in a straight line, forming panels of approximately 3.0 × 4.0 meters to control thermal and shrinkage cracks.
- After 28 days of complete curing, clean the grooves thoroughly and fill with PU sealant using a sealant gun and spatula to ensure flexible joint sealing.

12. Conclusion

The TECHNONICOL ULTRATHANE / ULTRATHANE ECO system offers a high-performance, cold-applied polyurethane waterproofing solution suitable for a wide range of applications including terraces, wet areas, basements, and podiums. This manual outlines a comprehensive methodology — from surface preparation to final protection — ensuring durability, flexibility, and long-term water resistance.

By adhering strictly to the specified surface preparation techniques, mixing ratios, application methods, and quality control measures such as moisture and DFT checks, the waterproofing membrane can achieve optimal performance. The inclusion of protective layers like screed and plaster further extends the lifespan of the system by shielding it from mechanical damage and environmental exposure.

When applied correctly by trained professionals using the recommended tools and procedures, the TECHNONICOL ULTRATHANE system ensures seamless, joint-free coverage with excellent crack-bridging, adhesion, and elongation properties, making it a robust and reliable waterproofing solution for both new construction and retrofit projects.

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