

UQESH® PF / IF

Waterborne Polyurethane Mortar Self-Leveling System

Installation Manual

1. Construction Tools Preparation (Pictures for Reference Only)

1.1 Surface Treatment Tools

Tool Type	Application Scenario
Floor Grinder	Conventional base treatment, large-area construction
Industrial Vacuum Cleaner	Base surface cleaning and dust extraction
Dust-Free Slitting Machine	Grooving for large-area surfaces
Angle Grinder	Edge and corner grinding treatment
Grooving Machine	Grooving at ditches, edge and corner positions
Diamond Grinding Pad	Matched with floor grinder/angle grinder
Resin Grinding Pad	Matched with floor grinder/angle grinder
Diamond Grooving Blade	Matched with slitting machine/grooving machine



Floor Grinder

Industrial Vacuum Cleaner
(with dust bag)

Dust-Free Slitting Machine



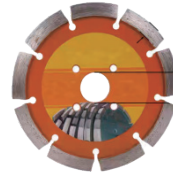
Angle Grinder



Diamond Grinding Pad



Resin Grinding Pad



Diamond Grooving Blade



Grooving Machine

1.2 Measuring & Inspection Tools

Tool Type	Testing Item	Recommendation
Electronic Temperature & Humidity Meter	Construction ambient temperature/humidity	-
Infrared Thermometer	Ground surface temperature	-
Concrete Moisture Meter	Concrete surface moisture content	Tramex is recommended
Level	Concrete surface flatness	-



Electronic Temperature
& Humidity Meter



Infrared Thermometer



Concrete Moisture Meter



Level

1.3 Mixing Tools

Tool Type	Recommendation
Mixing Bucket	Metal bucket
Dual-Head Mixer	Rotation speed ≥ 800 r/min, equipped with double-helix mixing head



Mixing Bucket



Dual-Head Mixer

1.4 Spreading & Leveling Tools

Tool Type	Function	Key Parameter
Serrated Trowel	Quantitative troweling, control coating thickness	Common notch depth: 1/2/3/5mm (selected based coating consumption)
Flat Trowel	Surface troweling, pore sealing	-
Spike Roller	Removes air bubbles for self-leveling construction	-



Serrated Trowel



Flat Trowel



Spike Roller

1.5 Auxiliary & Safety Tools

Masking Tape / Spiked Shoes / Drying Machine



Masking Tape



Spiked Shoes



Drying Machine

2. Concrete Base Treatment Quality Requirements

No.	Inspection Item	Acceptance Standard	Recommendation
1	Substrate surface moisture content	≤5%	Test by Tramex concrete moisture meter
2	Surface flatness	Deviation ≤ ±3mm	-
3	Compressive strength	≥25 MPa	-
4	Tensile strength	≥1.5MPa	-
5	Curing time of newly-poured concrete	≥28 d	Strictly follow the curing period before construction
6	Base surface condition	Firm, no sanding	Remove loose and sanding parts completely
7	Internal relative humidity of concrete	≤93%	-

3. Construction Environmental Requirements

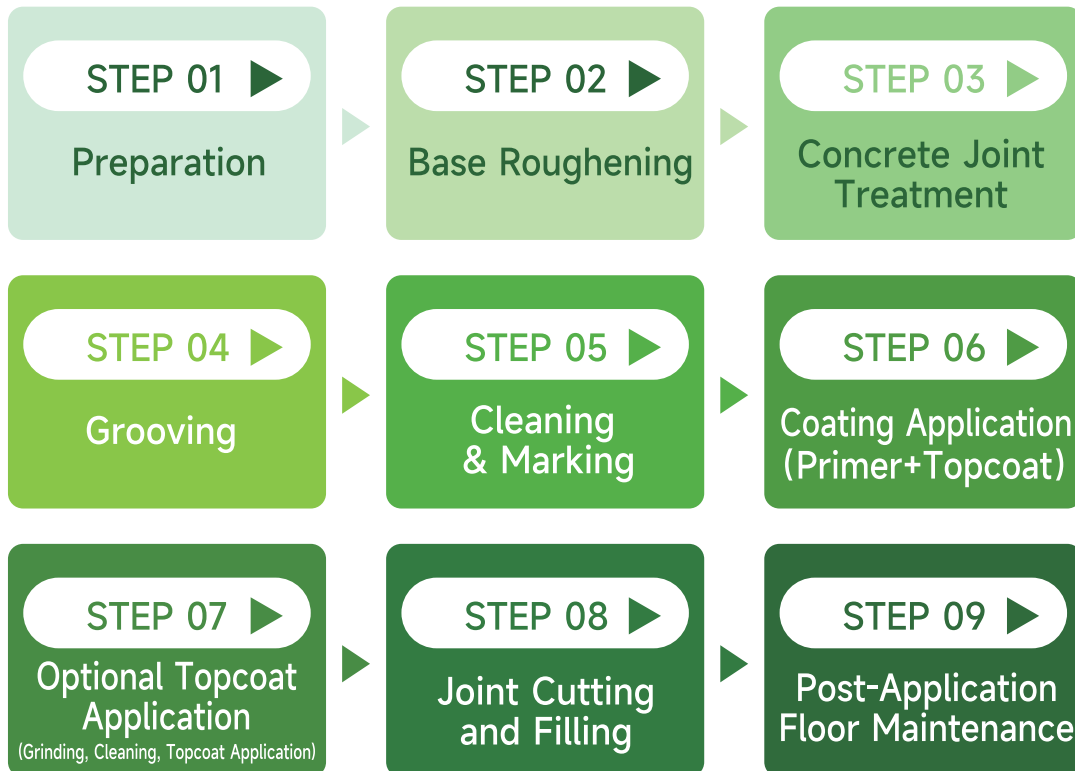
No.	Item	Standard Requirement	Applicable Scope
1	Substrate surface temperature	10~30°C	Standard Version
		5~10°C	Winter Version
2	Ambient relative humidity	RH ≤80%	Entire construction process
3	Construction area management	Fully enclosed, no pedestrian /vehicle access	Entire construction process

4. Product Consumption Specification

The product is supplied in full units as A+B+C+D packs.

Product	Total weight per set (kg/set)	Part A (kg/bag)	Part B (kg/bag)	Part C (kg/bag)	Part D (kg/bag)	Recommended Dosage (kg/m ² /mm)
PF-B/M/MW	16	2.5	2.8	10.2	0.5	2kg/m ² /1mm
IF/IFW	20	2.5	2.8	14.2	0.5	2kg/m ² /1mm
TAP 750/750W	8.5	2	3	3	0.5	0.1-0.14kg/m ² /0.06-0.08mm

5. Construction Procedure



Step 01 Preparation

1. Thoroughly clean the surface to remove oil stains; for heavily oil contamination, excavate the affected areas.
2. Treat all water seepage areas with waterproofing and dry retained moisture on the surface.
3. Use a grinding machine with diamond grinding pads to grind the substrate surface, removing cement laitance and cement marks.
4. For uneven substrates:
 - Use a diamond grinding machine to level raised areas.
 - Fill low areas with **polyurethane primer mixed with an appropriate amount of quartz sand** (please consult UQESH if material substitution is needed). After the mortar cures, use an angle grinder to smooth the repaired areas.
5. Remove hollow or delaminated areas. Fill pits or voids with **polyurethane primer and an appropriate amount of quartz sand** (please consult UQESH if material substitution is needed). After the mortar cures, use an angle grinder to smooth the repaired areas

Step 02 Roughening the Entire Base

- Use a grinding machine to grind the concrete surface, removing any laitance or loose structures.
- Ensure the surface is uniformly prepared, free of dust, loose particles, and unstable areas.
- The required roughness for coating application is **CSP 2 (for PF)** or **CSP 3 (for IF)**.

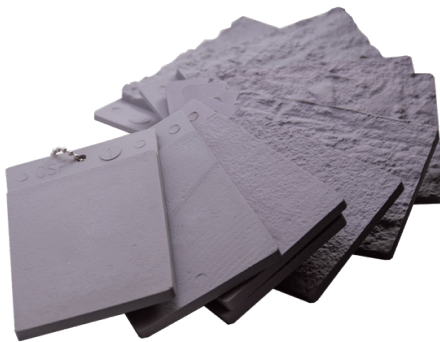


UQESH Recommendations for CSP

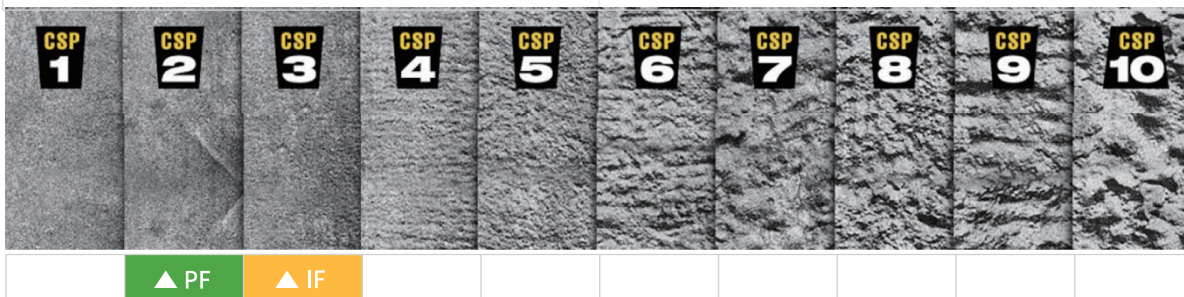
System	Thickness	UQESH Recommended CSP
PF	2-3mm	2
PF-Plus	3mm	2
IF-EC	3-4mm	3
IF	4-6mm	3

The International Concrete Repair Institute (ICRI)

Specifies 10 different conditions for base surface treatment and provides sample blocks for simulation. Each is assigned a CSP number ranging from 1 (nearly smooth) to 10 (extremely rough).



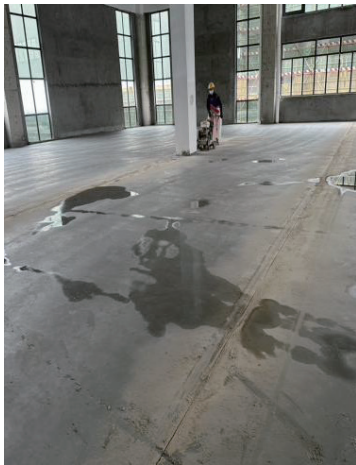
International Concrete Repair Institute (ICRI)
3166 River Road, Suite 132 Des Plaines,
IL 60018
USA
Phone: 001 847-827-0830
Fax: 001 847-827-0832
Web Site: www.icri.org



Step 03 Concrete Joint Treatment

3.1 Types of Concrete Joints

- Control Joints
- Cracks
- Construction Joints
- Movement Joints (including Expansion, Settlement, and Seismic Joints)



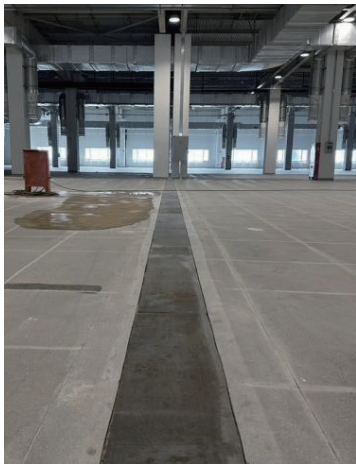
Control Joints



Cracks



Construction Joints



Movement Joints
(Expansion)



Movement Joints
(Settlement)



Movement Joints
(Seismic)

3.2 Concrete Joint Treatment Methods

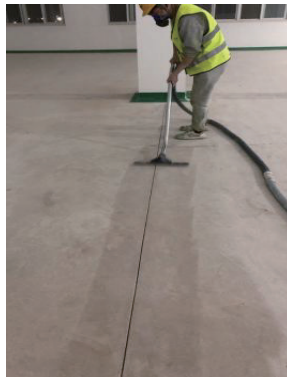
- **Control Joints**

Must be filled before applying the primer.

No.	Repair Procedures for Control Joints	Details
1	Cleaning	Remove sludge and debris from the joint.
2	Vacuuming	Remove dust from the joint and the surrounding area.
3	Filling	①. Prepare a PVC pipe approximately 100mm in diameter and 150–200mm in length.
		②. Fill the pipe with pre-mixed polyurethane primer to two-thirds of its height.
		③. Move the PVC pipe steadily and evenly to allow the material to fill the joint automatically.
4	Smoothing	Use a trowel to scrape off any excess material and ensure the surface is level.



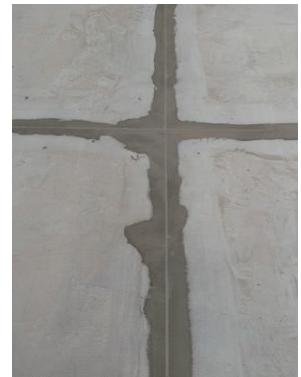
1. Cleaning



2. Vacuuming



3. Filling



4. Smoothing

- Cracks

Before applying the primer, cracks must be repaired as follows:

1. Use a cutting machine to cut a "V"-shaped groove along the crack.
2. Insert diagonal anchor grooves on both sides of the V-shaped groove, with the top of each groove located 50 mm from the crack and spaced at 150 mm intervals along the crack.
3. Fill the groove with UQESH® polyurethane primer mortar.
4. Smooth the surface to complete the repair.

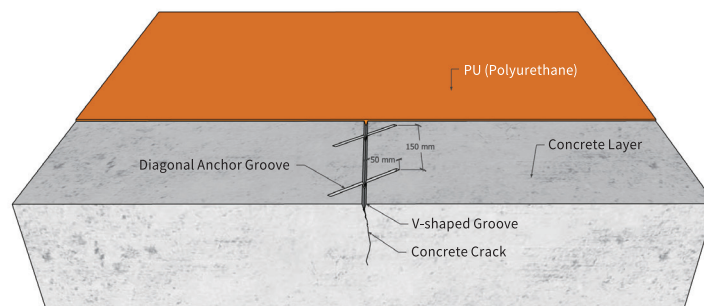


Illustration of Crack Treatment

- **Construction & Movement Joints**

1. Mark the locations of construction and Movement Joints before primer application.
2. After applying the topcoat and before finishing with a sealer, cut the original joint locations and fill them with sealant.

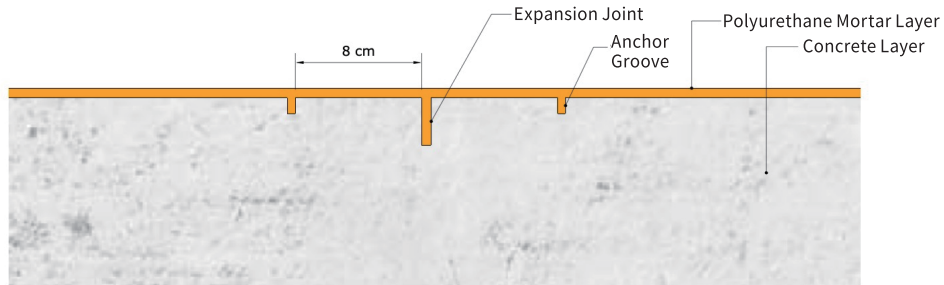


Illustration of Movement Joint (Expansion)

Step 04 Grooving

4.1 Anchor Grooves

Floor Thickness	Anchor Groove	Groove Width	Groove Depth	Notes
<2mm	No grooving	-	-	Edges, around machines, and near drains require standard grooving.
2mm-3mm	2m spacing	5mm	1× floor thickness	
≥4mm	2m spacing	5mm	1× floor thickness	

4.2 Corner Cutting

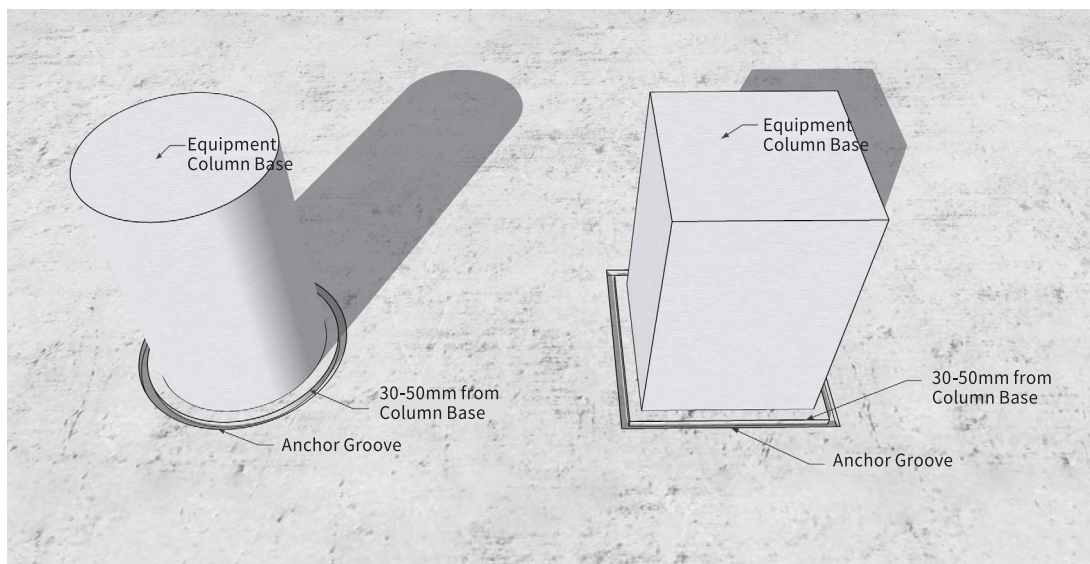


Illustration of Corner Cutting Around Column Footings

4.3 Cutting Around Walls and Obstacles

Areas like doorways, trenches, and around square/round equipment bases are considered free boundaries for the waterborne polyurethane flooring. Grooves must be cut to disperse mechanical and thermal stresses caused by shrinkage or temperature changes.

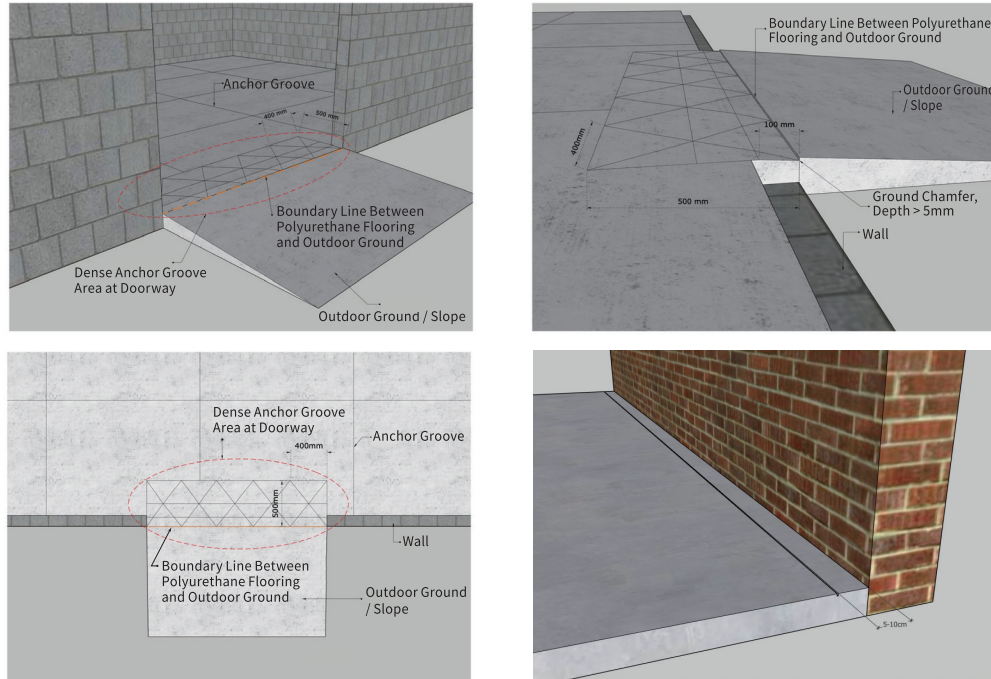


Illustration of Doorway Cutting

4.4 Groove Filling Treatment

Fill the grooves with UQESH® polyurethane primer mortar. Proceed with primer application immediately after filling.

4.5 Slope Treatment for Trenches

Grind and vacuum the surface, then use polyurethane mortar to create a slope. Ensure the finished polyurethane floor is flush with the edges of drains or trenches.

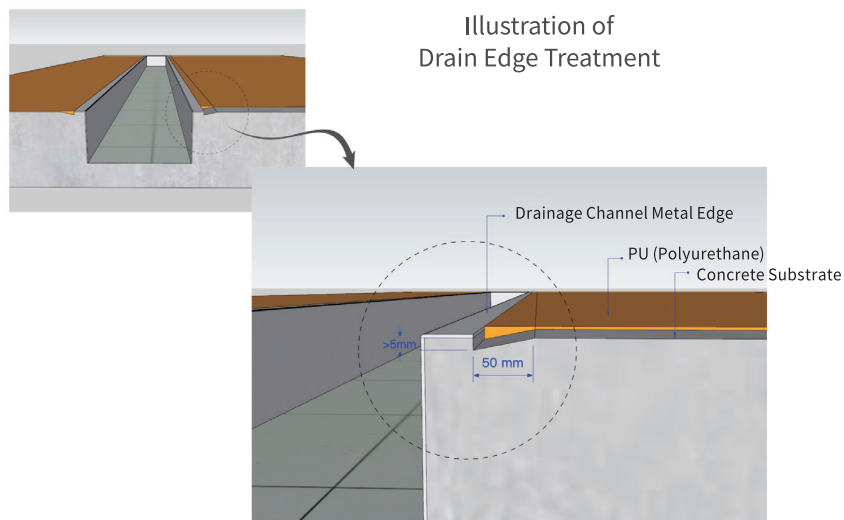


Illustration of Drain Edge Treatment

Step 05 Cleaning and Marking

- 5.1 Use a vacuum cleaner to clean the surface thoroughly before coating.
- 5.2 Mark the locations of construction and movement joints accurately.

Step 06 Coating Application (Primer + Topcoat)

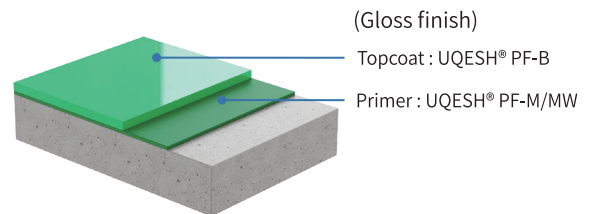
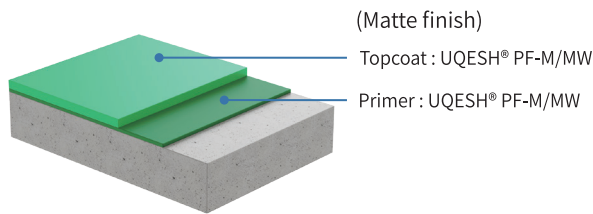
(a) Recommended Product Dosage Chart

PF System Component	Product	Recommended Dosage (kg/m ²)	
		2mm	3mm
Primer	UQESH® PF-M*/MW*	1.5	3
Topcoat	UQESH® PF-M/B*/MW*	2.5	3
Extra Topcoat (Optional)	UFlex® TAP 750/750W*	0.12	0.12

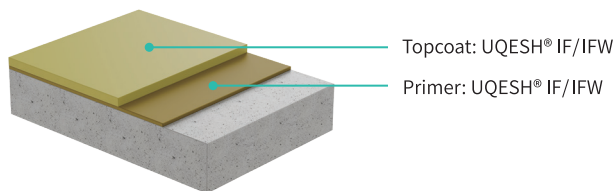
IF System component	Product	Recommended Dosage (kg/m ²)
		4mm
Primer	UQESH® IF/IFW*	3
Topcoat	UQESH® IF/IFW*	5

*-B: gloss finish; -M: matte finish; -W: winter version

(b) PF Illustration



(c) IF Illustration



(d) Trowel Tool Selection (Recommendation)

Coating Dosage (kg/m ²)	Trowel Type	Trowel Tooth Depth (mm)
<1kg	Flat	-
1-2kg	Serrated	2mm
2.5-3.5kg	Serrated	3mm
4-6kg	Serrated	5mm

6.1 Primer Application (PF/IF)

6.1.1 Mixing Sequence: A → D → B → C

Temp (°C)	Pot Life
25°C	≤10 minutes
15°C	15-20 minutes

NO.	Step	Details
①	Pre-Mix Main Agent	Shake Part A to disperse sediment, then pour it into a mixing bucket.
②	Add Color Paste	Add Part D into the mixing bucket.
③	Add Curing Agent	Add Part B into the mixing bucket.
④	Mix Liquid Components	Mix quickly for 10 seconds until the mixture is uniform.
⑤	Add Aggregates	With the mixer is running, add Part C and continue mixing for 30 seconds until the slurry is smooth and lump-free.
⑥	Mixing Time	Complete mixing in 40-90 seconds . The mixture must be used immediately.
⑦	Spreading	Pour the mixture immediately and spread using a 2-3mm serrated trowel.

*Adjust times based on temperature if needed.



6.1.2 After 5-10 minutes of spreading, use a flat trowel to lightly seal surface pores to seal the surface and remove air bubbles.



Primer Spreading



Removing Air Bubbles

6.1.3 Allow the primer to dry for approximately 8 hours. Drying time may vary based on environmental and base material conditions.

6.1.4 If the primer is left for over 48 hours, lightly sand the surface before proceeding to the next step.

6.2 Topcoat Application(PF/IF)

6.2.1 Material Mixing Sequence: Same as 6.1.1.

6.2.2 Spreading: Immediately apply the mixture onto the primed surface using an appropriate serrated trowel based on the specified dosage.

6.2.3 Deaerating: Use a spike roller to remove air bubbles from the surface.

6.2.4 Timing: Complete all steps within the open operation time.

Step 07 Optional Topcoat Application (TAP 750)

7.1 Use a 50-grit resin pad to lightly sand the surface.

7.2 Clean the surface with a vacuum.

7.3 Follow 6.1.1 for material mixing.

7.4 Immediately pour the mixture onto the treated surface and spread with a flat trowel.

7.5 Use a specialty short-haired roller for flooring to ensure the surface appearance and texture are uniform and consistent (select the roller model based on the required surface texture). It is recommended to use a combination of long and short rollers during application: first, use the short roller to evenly spread the coating horizontally, and then use the long roller to lightly roll vertically to eliminate roller marks and achieve the best application results.

7.6 Allow the coating to dry for approximately 8 hours, drying time depending on environmental and substrate conditions.

Step 08 Joint Cutting and Filling

After all coatings have fully cured, cut along original joints, clean out dust and debris, then fill with sealant densely. Protect the finished joints after filling.

Step 09 Post-Application Floor Maintenance

9.1 Enclose the area during curing. Curing time may vary depending on environmental and substrate conditions.

9.2 Load Scenarios and Curing Times (25°C):

Curing time	Opening for
8 hours	Foot traffic
24 hours	Light vehicular / equipment traffic
48 hours	Heavy traffic and chemical exposure

★ Times are estimates and may vary depending on environmental and substrate conditions.



Post-Application Floor Maintenance