

Mapefloor™ resin flooring: Installation instructions

Mapefloor resin flooring systems are designed to protect concrete substrates that are subject to pedestrian and vehicular traffic against mechanical, chemical attack and penetration from aggressive substances, as well as providing improved aesthetic appearance. Mapefloor resin flooring systems are typically specified for use on industrial and civil projects, each with their own requirements for a protective and decorative coating.

For this reason, Mapefloor resin flooring systems are designed as a layering system that can be suited by the user to fit the individual project requirements. This Installation Guide is intended to inform the owner, specifier and contractor on proper procedures recommended by MAPEI for a successful application.

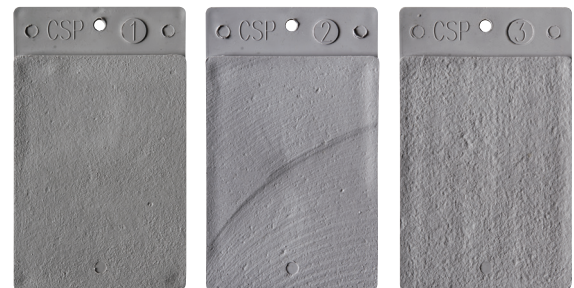
1. Condition of concrete

- Concrete surfaces must be free of voids, ridges, fins, and other sharp projections and honeycombs.
- Concrete surfaces should be clean, sound, and free of laitance, loose aggregate, dirt, oil, grease, wax, curing agents, sealers, form-release agents and other contaminants that can prevent, reduce or affect adhesion or performance of the coating.
- New concrete must have been cured for at least 14 days and have a minimum compressive strength of 3,000 psi (≈20.7 MPa) for pedestrian traffic and > 3,600 psi (≈24.8 MPa) for vehicular traffic.
- The tensile strength of the concrete substrate after preparation should test at greater than or equal to 200 psi (≈1.38 MPa) per ACI 503R-93.
- Ensure that all penetrations and drains are in place before installation of the concrete to avoid later penetrations after the Mapefloor resin flooring system is installed.
- Concrete surfaces must be visibly dry and pass a 24-hour plastic mat test (with no condensation) in accordance with ASTM D4263 before application of the Mapefloor resin flooring system.
- In case of moisture presence, verify the limits stated in each product's Technical Data Sheet according to the different test methods available.
 - ASTM E1907 or surface moisture tester
 - ASTM F2170 or relative humidity of concrete method
 - ASTM F1869 or moisture vapor drive method

- Existing concrete surfaces should be confirmed to be free of any hydrocarbons or other through petrographic analysis.

2. Surface preparation for concrete

- 2.1. Chemically clean the concrete surface by scrubbing with detergents or use an appropriate commercial degreaser to remove oil, grease, curing/sealing compounds and heavy dirt. Thoroughly rinse the surface to eliminate all cleaning chemical residues.
- 2.2. Clean and treat all exposed reinforcing steel with MAPEI's *Mapefer™ 1K* corrosion-inhibiting coating before applying an appropriate repair mortar.
- 2.3. Grind all ridges and sharp projections and repair all voids, honeycombs, bugholes and delaminated areas with an epoxy repair mortar such as *Mapefloor EP19* or *Mapefloor EP20*. Shotblasting is the preferred method for surface preparation of concrete surfaces. Mechanically prepare the surface according to the Technical Guideline 310.2R from the International Concrete Repair Institute (ICRI) to a concrete surface profile (CSP) of #3 at the minimum and up to #6 depending on the final thickness of the system to be applied.



CSP 1: Acid etching **CSP 2:** Grinding **CSP 3:** Light shotblasting



CSP 4: Light scarification **CSP 5:** Medium shotblasting **CSP 6:** Medium scarification

- 2.4. Movement cracks must be treated with an elastic sealer and reflected on the applied coating. Alternatively, they can be made rigid and re-cut on the substrate before applying an elastic sealer and reflected on the coating. Remove debris and eliminate all dust and fines from substrate using a vacuum and thoroughly agitate the surface with a brush attachment.
- 2.5. Prime with *Primer SN™* and detail cracks from 1/32" to 1/16" (≈1 to ≈1.5 mm) in width with an appropriate polyurethane sealant like *Mapeflex P2 SL* extended at least 2" (≈5 cm) – or as defined by the engineer – on either side of the crack at an average layer thickness of 30 mils (≈0.75 mm) in dry film thickness (DFT).
- 2.6. Larger cracks from 1/16" to 3/8" (≈1.5 to ≈10 mm) should be routed out or treated by abrasive blasting, blown clean and filled flush with an appropriate polyurethane sealant like *Mapeflex P2 SL*. Ensure that a bond-breaking backer rod or tape is used to avoid three-sided bonding of the polyurethane sealant. Sealant should be applied to the inside of the crack only, and then primed with *Primer SN* and detailed with an appropriate polyurethane sealant like *Mapeflex P2 SL* extended at least 2" (5 cm) on either side of the crack at an average thickness of 30 mils (≈0.75 mm) DFT. Refer to the appropriate polyurethane sealant's Technical Data Sheet (TDS).
- 2.7. Non-moving cracks greater than 3/8" (≈10 mm) should be routed out and repaired with an appropriate MAPEI repair epoxy like *Epojet™* or *Epojet LV*.
- 2.8. Seal control joints with an appropriate polyurethane sealant such as *Mapeflex P2* while maintaining the width-to-depth ratio recommended by MAPEI's Technical Services Department.
- 2.9. Ensure that a 45-degree cant is 1" (2.5 cm) wide with a polyurethane sealant between floor/wall and floor/column applications.
- 2.10. Thoroughly clean the entire surface before application of a *Mapefloor* resin flooring system by sweeping and vacuuming surface.
- 2.11. Do not apply the *Mapefloor* resin flooring system until all applied sealants have fully cured.
- 2.12. Install keyways in the substrate at all terminations, using a chipping gun or a crack chaser. Keyways are generally 1/4" (6 mm) deep and extend back 2" to 6" (5 to 7.5 cm) and filled with coating. In order for the terminated edge to be more resistant to impacts, bring the coating flush with another surface.

3. Temperature requirements

Mapefloor resin flooring systems are designed to be applied between the minimum and maximum ambient and substrate temperatures of 46°F and 95°F (8°C and 35°C). Usage outside of this recommended temperature range will diversely affect proper application, as well as physical properties of the cured system.

- 3.1. In temperatures below 50°F (≈10°C), the individual components of the *Mapefloor* resin flooring system will have a thicker viscosity than

when manufactured. This will result in products that are harder to mix and apply. If colder temperatures are expected overnight, the unopened, unused *Mapefloor* resin flooring system components should be stored in a heated space.

- 3.2. In temperatures above 77°F (≈25°C), the individual components of the *Mapefloor* resin flooring system will have a thinner viscosity than when manufactured. Higher temperatures will also affect the pot life and open times, accelerating the curing and modifying final physical properties of the applied system. If ambient temperatures are higher than the recommended temperature range for application, the contractor strongly encouraged to wait until cooler evening temperatures to apply the *Mapefloor* resin flooring system.
- 3.3. The dew point is the temperature at which moisture will condense on a surface. The substrate temperature should be at least 5 degrees Fahrenheit (≈3 degrees Celsius) higher than the dew point before product application and maintained at this level during curing. See the following charts for illustrations of calculating the dew point:

DEW POINT CALCULATIONS

Ambient air temperature (in Fahrenheit)

	20°F	30°F	40°F	50°F	60°F	70°F	80°F	90°F	100°F	110°F	120°F
90%	18°F	28°F	37°F	47°F	57°F	67°F	77°F	87°F	97°F	107°F	117°F
85%	17°F	26°F	36°F	45°F	55°F	65°F	75°F	84°F	95°F	104°F	113°F
80%	16°F	25°F	34°F	44°F	54°F	63°F	73°F	82°F	93°F	102°F	110°F
75%	15°F	24°F	33°F	42°F	52°F	62°F	71°F	80°F	91°F	100°F	106°F
70%	13°F	22°F	31°F	40°F	50°F	60°F	68°F	78°F	88°F	96°F	105°F
65%	12°F	20°F	29°F	36°F	47°F	57°F	66°F	76°F	85°F	93°F	103°F
60%	11°F	19°F	27°F	36°F	45°F	55°F	64°F	73°F	83°F	92°F	101°F
55%	9°F	17°F	25°F	34°F	43°F	53°F	61°F	70°F	80°F	89°F	96°F
50%	6°F	15°F	23°F	31°F	40°F	50°F	59°F	67°F	77°F	86°F	94°F
45%	4°F	13°F	21°F	29°F	37°F	47°F	58°F	64°F	73°F	82°F	91°F
40%	1°F	11°F	18°F	26°F	35°F	43°F	52°F	61°F	69°F	78°F	87°F
35%	-2°F	8°F	16°F	23°F	31°F	40°F	48°F	57°F	65°F	74°F	83°F
30%	-6°F	4°F	13°F	20°F	28°F	36°F	44°F	52°F	61°F	69°F	77°F

Example in Fahrenheit: If the ambient air temperature is 70°F and relative humidity is 65%, the dew point is 57°F. Therefore, no coating should be applied unless the substrate temperature is 5 degrees higher than the dew point, or a minimum of 62°F (57°F + 5°F = 62°F).

Ambient air temperature (in Celsius)

	-7°C	-1°C	4°C	10°C	16°C	21°C	27°C	32°C	38°C	43°C	49°C
90%	-8°C	-2°C	3°C	8°C	14°C	19°C	25°C	31°C	36°C	42°C	47°C
85%	-8°C	-3°C	2°C	7°C	13°C	18°C	24°C	29°C	35°C	40°C	45°C
80%	-9°C	-4°C	1°C	7°C	12°C	17°C	23°C	28°C	34°C	39°C	43°C
75%	-9°C	-4°C	1°C	6°C	11°C	17°C	22°C	27°C	33°C	38°C	41°C
70%	-11°C	-6°C	-1°C	4°C	10°C	16°C	20°C	26°C	31°C	36°C	41°C
65%	-11°C	-7°C	-2°C	2°C	8°C	14°C	19°C	24°C	29°C	34°C	39°C
60%	-12°C	-7°C	-3°C	2°C	7°C	13°C	18°C	23°C	28°C	33°C	38°C
55%	-13°C	-8°C	-4°C	1°C	6°C	12°C	16°C	21°C	27°C	32°C	36°C
50%	-14°C	-9°C	-5°C	-1°C	4°C	10°C	15°C	19°C	25°C	30°C	34°C
45%	-16°C	-11°C	-6°C	-2°C	3°C	8°C	14°C	18°C	23°C	28°C	33°C
40%	-17°C	-12°C	-8°C	-3°C	2°C	6°C	11°C	16°C	21°C	26°C	31°C
35%	-19°C	-13°C	-9°C	-5°C	-1°C	4°C	9°C	14°C	18°C	23°C	28°C
30%	-21°C	-16°C	-11°C	-7°C	-2°C	2°C	7°C	11°C	16°C	21°C	25°C

Example in Celsius: If the ambient air temperature is 21°C and the relative humidity is 60%, the dew point is 13°C. Therefore, no coating should be applied unless the surface temperature is roughly 3 degrees higher than the dew point, or a minimum of 16°C (13°C + 3°C = 16°C).

General (instructions)

- Surface profile, application technique/equipment, applicator coverage, waste and thinning can all affect the amount of wet coating applied to achieve proper mil thickness. Ensure that wet film gauges are used to verify the wet film thickness, and adjust as needed to achieve the correct dry mil build (DFT).
- Before application, refer to the “Mixing” sections in the TDS for MAPEI’s resin flooring line.
- Read and understand all warnings and instructions on container labels and on the SDSs.
- The above information is based on standard industrial practices and meant only to outline the hazards, not be all-inclusive. Nothing contained within this document should supersede local laws, codes, ordinances or other regulations, or the instructions of other manufacturers for the use of their products. Consult the Occupational Safety and Health Administration (OSHA) or Canada’s Workplace Hazardous Materials Information System (WHIMS) regarding further details and compliance. Always consult and familiarize yourself with the SDS before using products.

Storage

- All components of *Mapefloor* resin flooring systems should be stored at ambient temperature of between 70°F to 80°F (≈21°C to ≈27°C). Consult each component’s TDS for specific storage requirements.
- When work is stopped, ensure that all primers and coatings are stored in their tightly sealed containers. Do not keep any open containers in confined spaces.

Cleanup

- Solvents that contain alcohol should never be used with a *Mapefloor* resin flooring system.

4. General

- *Mapefloor* resin flooring systems are designed to be applied between the ambient temperatures of 45°F to 95°F (≈8°C to ≈35°C); for optimum installation, the ambient temperature should be between 70°F and 80°F (≈21°C and ≈27°C). Store materials at 70°F to 80°F (≈21°C to ≈27°C) for two days before installation and ensure that the substrate temperature does not fall below 45°F (≈8°C) when applying polyurethanes, or below 50°F (≈10°C) when applying epoxies. Colder temperatures will increase the viscosity of *Mapefloor* system components and thereby increase the materials’ resistance to mixing and flowing.

- All quantities indicated in this installation guide assume surfaces with a CSP of #3. Quantity estimates of materials can be affected by the surface profile changes, whether material is left in containers or whether the contractor applies more material than is required. Actual coverage will be less than theoretical coverage.
- Never coat wet or moist surfaces. When in doubt, utilize a moisture meter or perform a plastic mat test (reference ASTM D4263). Allow to dry before application.
- Do not use solvents or thinners to dilute the materials.
- Solvent-based products are generally incompatible with asphaltic compounds that may be found on parking decks.
- Shotblasting, or other mechanical means approved by the project engineer, is required on all concrete surfaces before application of the *Mapefloor* resin flooring system. Consult a MAPEI Technical Services representative for specific job recommendations or for alternate methods of surface preparation.
- Mix all material components thoroughly before use. Read label instructions carefully.
- Do not mix combinations of different coating materials without consulting a MAPEI Technical Services representative.
- Because of the difficulty of removing a coating after it cures, it is much easier to use caution or to use drop cloths or masking to keep the coating off an adjacent surface during application.

Note: Use of a *Mapefloor* resin flooring system in areas subject to higher loads than recommended in a system component’s Technical Data Sheet can void any claim or warranty stated by MAPEI.

