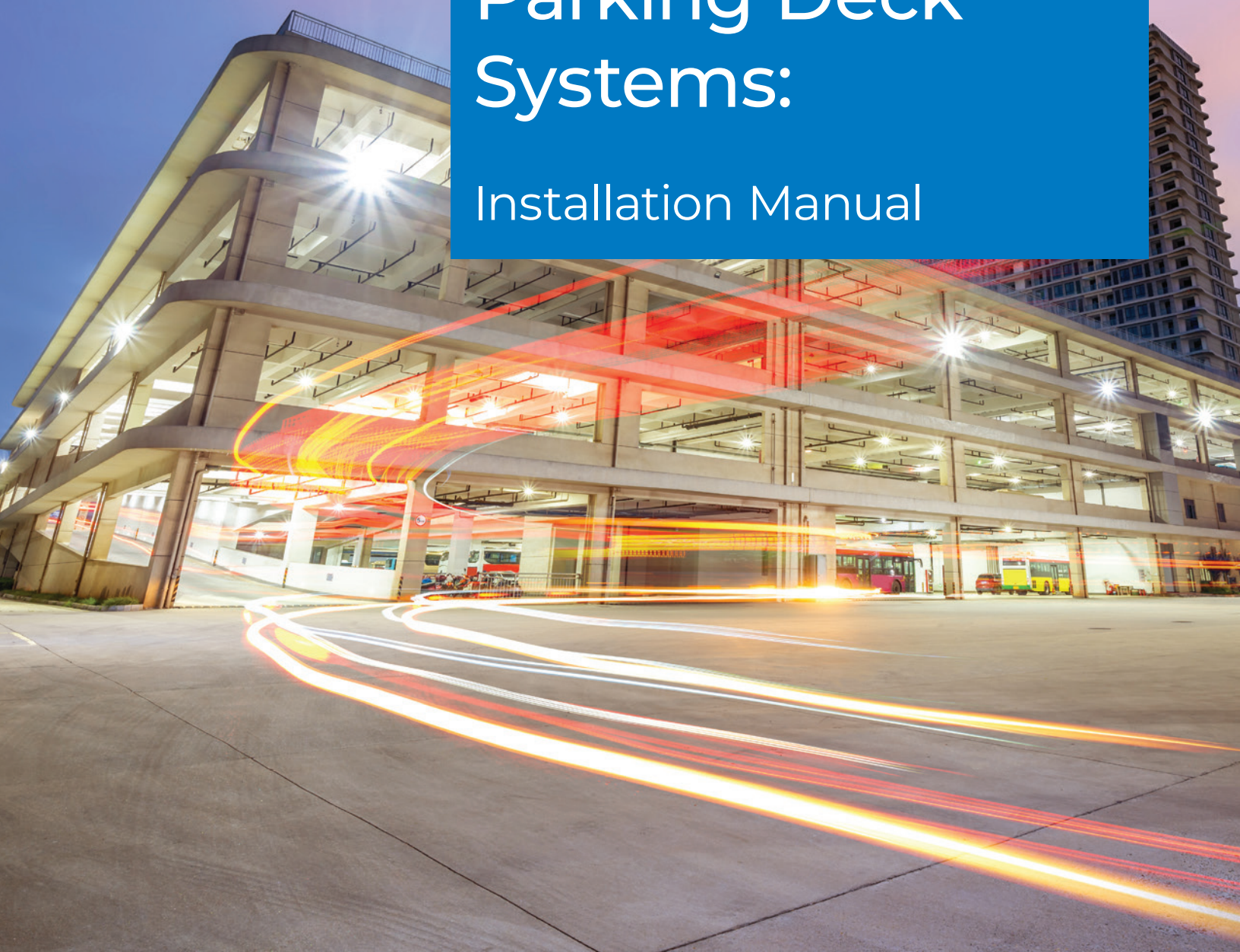


Mapefloor™ Parking Deck Systems:

Installation Manual



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Introduction

The purpose of this manual is to provide background information on coating concrete substrates, and to familiarize the reader with various treatments and procedures as they relate to protective polyurethane coatings. In addition, it will assist the specifier in the selection of the coating system suitable for the specific conditions of the project.

This manual is written to provide general information to engineers, inspectors, applicators, maintenance and management personnel, and others who are intimately involved in the application of protective polyurethane coatings. This manual also aids in troubleshooting challenges, along with outlining repair and prevention techniques.

This manual is not intended to provide exact information, specifications or details for specific jobs, but rather to provide general background information. Each job will have certain conditions and design specifics that require special consideration.

We hope that this guide will assist you with your construction schedules and look forward to a continuing relationship with your company for all of your concrete repair, waterproofing and deck-coating requirements. For questions related to this manual, please contact MAPEI's Technical Services Department.



Installation Instructions

General description

The *Mapecfloor* parking deck systems are designed to provide waterproofing and protection on elevated concrete substrates that are subject to pedestrian and vehicular traffic. *Mapecfloor* parking deck systems are typically specified for use on balconies, terraces, walkways, multi-story parking garages (vehicles less than 4,000 lbs. [1 813 kg] axle load capacity*), stadiums and mechanical rooms, each with their own requirements for a protective and decorative coating.

For this reason, *Mapecfloor* parking deck systems are designed as layering systems that can be modified to the individual project requirements. This Installation Instructions section is intended to aid the owner, specifier and contractor on proper procedures recommended by MAPEI for a successful application.

** Use of Mapecfloor parking deck systems in areas subject to higher loads and impact may void any claim or warranty stated by MAPEI.*

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 will affect the bonding 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 4,000 psi (27.6 MPa) for vehicular traffic.
- The tensile strength of the concrete substrate after preparation should test at greater than or equal to 200 psi (1.40 MPa) per ACI 503R-93.
- New concrete that will receive *Mapecfloor* coatings should be water-cured. In the event that a curing compound must be used, it should be *Mapecure*™ DR dissipating resin only; all other curing compounds require prior approval from MAPEI's Technical Services Department.
- The surface of the concrete should be sloped to drains at a minimum of 1/8" per foot (3 mm per 30 cm.).

- Ensure that all penetrations and drains are in place before installation of *Mapefloor* parking deck systems to avoid later penetrations after the *Mapefloor* coating is installed.
- Before application of *Mapefloor* parking deck systems, concrete surfaces must be visibly dry and have no condensation, in accordance with ASTM D4263.
- Existing concrete surfaces should be tested for hydrocarbons or other contaminants, such as chloride content and carbonation, through petrographic analysis.

Surface preparation for concrete

1. Chemically clean the concrete surface by scrubbing it with detergents or use an appropriate commercial degreaser to remove oil, grease, curing/sealing compounds, heavy dirt and dust. Contact the curing and sealing manufacturer for proper removal of specific cure/seal products used.
2. Grind all ridges and sharp projections. Repair all voids, honeycombs, bug holes and delaminated areas. Clean and treat all exposed reinforcing steel with MAPEI's *Mapefer*™ 1K corrosion-inhibiting coating before applying an appropriate repair mortar, such as MAPEI's *Planitop*® 18 or *Planitop 18 ES*. Alternately, repair these areas with a 100% epoxy such as *Primer SN*™ mixed with sand at a ratio of one part of epoxy per three to five parts of 20- to 40-mesh sand, until the desired consistency is achieved. Allow epoxy patching to cure for about 1 day at 75°F (24°C).
3. Shotblasting is the preferred method for surface preparation of concrete surfaces. Mechanically prepare the surface to an International Concrete Repair Institute (ICRI) minimum concrete surface profile (CSP) of #3.
4. Cracks from 1/32" to 1/16" (1 to 1.5 mm) in width should be cleaned, primed with *Primer SN* or *Mapefloor PU Primer* and detailed with *Mapefloor PU 400 FC*, extended at least 2" (5 cm) – or as defined by the engineer – on either side of the crack at an average layer thickness of 20 mils in wet film thickness (WFT).
5. Large 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 or *Mapeflex*™ P2 NS or *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* or *Mapefloor PU Primer* and detailed with *Mapefloor PU 400 FC* extended at least 2" (5 cm) on either side of the crack at

an average thickness of 20 mils WFT. Refer to the appropriate polyurethane sealant's Technical Data Sheet (TDS) for application guidelines not included above.

6. Non-moving cracks greater than 3/8" (10 mm) should be routed out and repaired with an appropriate MAPEI epoxy adhesive in accordance with one of the following ACI Repair Application Procedures (RAP):
 - RAP-1, Structural Crack Repair By Epoxy Injection
 - RAP-2, Crack Repair by Gravity Feed With Resin
7. Seal control joints with *Mapectex P2 NS* or *Mapectex P2 SL*, maintaining the width-to-depth ratio recommended by MAPEI's Technical Services Department.
8. Ensure that a 45-degree cant is made with *Mapectex P2 NS* between floor/wall and floor/column applications.
9. Clean the entire surface before application of *Primer SN* or *Mapectex PU Primer* by sweeping and/or blowing with an electric blower.
10. Do not apply a *Mapectex* parking deck system until all applied sealants have fully cured. Sealants should cure for at least 24 hours before installation of *Primer SN* or *Mapectex PU Primer*.
11. Install keyways in the substrate at all terminations.

Temperature requirements

- *Mapectex* parking deck systems are designed to be applied at ambient temperatures between 45°F and 85°F (7°C and 29°C). Usage outside of this recommended temperature range can adversely affect proper application, as well as performance of the cured systems.
- In temperatures below 45°F (7°C), the individual components of a *Mapectex* parking deck 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 components of a *Mapectex* parking deck system should be stored in a heated space. Precondition all *Mapectex* parking deck system components to 70°F (21°C) before mixing and applying.

- In temperatures above 85°F (29°C), the individual components of a *Mapecfloor* parking deck system will have a thinner viscosity than when manufactured. Higher temperatures will also adversely affect the curing and final performance of the applied system. If ambient temperatures are higher than the recommended temperature range for application, the contractor should wait until cooler evening temperatures to apply a *Mapecfloor* parking deck system.
- Do not install under conditions where the ambient temperature is increasing or in direct sunlight. Both ambient and surface temperatures should be falling at time of application.
- The dew point is the temperature at which moisture will condense on a surface. The substrate and ambient temperature should be at least 5 degrees Fahrenheit (2.8 degrees Celsius), higher than the dew point before product application and maintained at this level during curing. See the charts below 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
Relative humidity	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 and ambient temperature is 5 degrees Fahrenheit higher than the dew point, or a minimum of 62°F (57°F + 5°F = 62°F).

		Ambient air temperature (in Celsius)										
Relative humidity		-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 and ambient temperature is roughly 3 degrees Celsius higher than the dew point, or a minimum of 16°C (13°C + 3°C = 16°C).

Mixing

1. Before mixing, review the mixing instructions on each TDS of the associated products. Proper mix ratios are essential for optimum *Mapefloor* system performance.
- 2a. For *Primer SN*, premix the Part A resin to a homogenous consistency (for 2 to 3 minutes) using a low-speed drill (at 300 to 450 rpm) and appropriate paddle. Pour the Part B hardener into the Part A container and mix thoroughly to a smooth, homogenous consistency. Do not mix at high speeds, which can trap air within the mixed material.
- 2b. For *Mapefloor PU Primer*, premix the Part A and Part B separately. Add Part B to Part A and mix at low speed for 2 to 3 minutes or until a homogenous consistency is achieved.
3. For the *Mapefloor PU 400 FC* basecoat, premix the Part A to a homogenous consistency (for 2 to 3 minutes) using a low-speed drill (at 300 to 450 rpm) and appropriate paddle. Pour the Part A into the Part B container and mix thoroughly to a smooth

	Standard-Pedestrian System	Heavy-Pedestrian/ Light-Vehicular System	Heavy-Duty-Vehicular System	Extreme-Vehicular System
<i>Primer SN</i>	9 to 15 mils	9 to 15 mils	9 to 15 mils	9 to 15 mils
<i>Mapefloor PU Primer</i>	3 to 5 mils	3 to 5 mils	3 to 5 mils	3 to 5 mils
<i>Mapefloor PU 400 FC</i>	20 mils	20 mils	20 mils	20 mils
<i>Mapefloor Finish 415 NA / 450</i>	12 mils	15 mils	12 mils	N/A
<i>Mapefloor Finish 415 NA / 450</i>	N/A	N/A	12 mils	N/A
<i>Planiseal® Traffic Coat</i>	N/A	N/A	N/A	20 mils
<i>Planiseal Traffic Coat</i>	N/A	N/A	N/A	40 mils*
Total excluding primer and aggregate	32 mils	35 mils	44 mils	80 mils*

* Actual results will vary, depending on aggregate gradation.

homogenous consistency and color. Do not mix at high speeds. **Never add Part B to Part A, as the mixture will not be homogenous.**

- For the *Mapefloor Finish 415 NA* and *Mapefloor Finish 450* topcoats, premix the Part A resin to a homogenous consistency (for 2 to 3 minutes) using a low-speed drill (at 300 to 450 rpm) and appropriate paddle. Pour the Part B hardener into the Part A container and mix thoroughly to a smooth, homogenous consistency and color. Do not mix at high speeds, which can trap air within the mixed material.

Application of coating systems

General (materials):

- *Primer SN* two-component epoxy primer
- *Mapefloor PU Primer* two-component, polyurethane primer
- *Mapefloor PU 400 FC* two-component, fast-cure polyurethane basecoat
- *Mapefloor Finish 415 NA* two-component, aromatic polyurethane topcoat
- *Mapefloor Finish 450* two-component, aliphatic polyurethane topcoat

General (system thickness):

- For a **standard-pedestrian system**: Minimum 32 mils WFT, excluding aggregate and primer
- For a **heavy-pedestrian/light-vehicular system**: Minimum 35 mils WFT, excluding aggregate and primer
- For **heavy-duty-vehicular system***: Minimum 44 mils WFT, excluding primer and aggregate
* *High-wear areas in parking garages (such as spiraled ramps, turns, ticket booths and drive lanes)*
- For **extreme-vehicular system**: Minimum 80 mils WFT, excluding primer and aggregate

General (instructions):

- Surface profile, application technique/equipment, applicator overage and waste 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. Note that both wet and dry film readings are equivalent.
- Before application, refer to the “Mixing” section above and in the TDSs of each system component.

Mapefloor parking deck systems

System 1: Standard-Pedestrian (elevated balconies/walkways, terraces)

1. Apply *Primer SN* at a thickness of 9 to 15 mils WFT or a rate of 107 to 178 sq. ft. per U.S. gal. (2.63 to 4.37 m² per L). OR apply *Mapefloor PU Primer* at a thickness of 3 to 5 mils WFT or at a rate of 320 to 530 sq. ft. per U.S. gal. (7.84 to 13.0 m² per L).
2. Pour the mixed *Mapefloor PU 400 FC* onto the surface of the properly prepared substrate and spread it evenly and uniformly with a rubber squeegee at a depth of 20 mils WFT or a rate of 80 sq. ft. per U.S. gal. (1.96 m² per L). Apply *Mapefloor PU 400 FC* within 6 to 24 hours of application of *Primer SN* or *Mapefloor PU Primer*. Re-prime if *Mapefloor PU 400 FC* cannot be applied within 24 hours (contact MAPEI’s Technical Services Department for re-priming instructions). Steep slopes may require thinner, multiple passes of coating to achieve the necessary thickness.
3. Allow *Mapefloor PU 400 FC* to cure for at least 3 hours at 75°F (24°C) or until tack-free. Then apply mixed *Mapefloor Finish 415 NA* or *Mapefloor Finish 450*. Spread evenly and uniformly with a rubber squeegee at a depth of 12 mils WFT or a rate of 134 sq. ft.

per U.S. gal. (3.28 m² per L) and back-roll to achieve the desired thickness. Apply *Mapecfloor Finish 415 NA* or *Mapecfloor Finish 450* within 24 hours of application of *Mapecfloor PU 400 FC*.

4. Immediately broadcast 16/30 mesh silica quartz sand aggregate – evenly distributed – into the wet coating at a rate of 10 to 15 lbs. per 100 sq. ft. (or 0.49 to 0.73 kg per m²) and back-roll. Allow 8 to 10 hours for curing.
5. Standard-pedestrian areas should average 32 mils WFT of the basecoat and topcoat combined, excluding the aggregate and primer.

System 2: Heavy-Pedestrian/Light-Vehicular (stadiums, malls, parking stalls, drive lanes)

1. Apply *Primer SN* at a thickness of 9 to 15 mils WFT or a rate of 107 to 178 sq. ft. per U.S. gal. (2.62 to 4.36 m² per L). OR apply *Mapecfloor PU Primer* at a thickness of 3 to 5 mils WFT or at a rate of 320 to 530 sq. ft. per U.S. gal. (7.84 to 13.0 m² per L).
2. Pour the mixed *Mapecfloor PU 400 FC* onto the surface of the properly prepared substrate and spread it evenly and uniformly with a rubber squeegee at a depth of 20 mils WFT or a rate of 80 sq. ft. per U.S. gal. (1.96 m² per L). Apply *Mapecfloor PU 400 FC* within 6 to 24 hours of application of *Primer SN* or *Mapecfloor PU Primer*. Re-prime if *Mapecfloor PU 400 FC* cannot be applied within 24 hours (contact MAPEI's Technical Services Department for re-priming instructions). Steep slopes may require thinner, multiple passes of coating to achieve the necessary thickness.
3. Allow *Mapecfloor PU 400 FC* to cure for at least 3 hours at 75°F (24°C) or until tack-free. Then apply mixed *Mapecfloor Finish 415 NA* or *Mapecfloor Finish 450*. Spread evenly and uniformly with a rubber squeegee at a depth of 15 mils WFT or a rate of 106 sq. ft. per U.S. gal. (2.60 m² per L) and back-roll to achieve the desired thickness. Apply *Mapecfloor Finish 415 NA* or *Mapecfloor Finish 450* within 24 hours of application of *Mapecfloor PU 400 FC*.
4. Immediately broadcast 16/30 mesh silica quartz sand aggregate – evenly distributed – into the wet coating at a rate of 10 to 15 lbs. per 100 sq. ft. (or 0.49 to 0.73 kg per m²) and back-roll. Allow 8 to 10 hours for curing.

5. Heavy-pedestrian/light-vehicular areas should average 35 mils of the basecoat and topcoat combined, excluding the aggregate and primer.

System 3: Heavy-Duty-Vehicular (ramps, ticket booths, turn areas)

1. Apply *Primer SN* at a thickness of 9 to 15 mils WFT or a rate of 107 to 178 sq. ft. per U.S. gal. (2.62 to 4.36 m² per L). OR apply *Mapefloor PU Primer* at a thickness of 3 to 5 mils WFT or at a rate of 320 to 530 sq. ft. per U.S. gal. (7.84 to 13.0 m² per L).
2. Pour the mixed *Mapefloor PU 400 FC* onto the surface of the properly prepared substrate and spread it evenly and uniformly with a rubber squeegee at a depth of 20 mils WFT or a rate of 80 sq. ft. per U.S. gal. (1.96 m² per L). Apply *Mapefloor PU 400 FC* within 6 to 24 hours of application of *Primer SN* or *Mapefloor PU Primer*. Re-prime if *Mapefloor PU 400 FC* cannot be applied within 24 hours (contact MAPEI's Technical Services Department for re-priming instructions). Steep slopes may require thinner, multiple passes of coating to achieve the necessary thickness.
3. Allow *Mapefloor PU 400 FC* to cure (for at least 3 hours at 75°F [24°C] or until tack-free). Then apply mixed *Mapefloor Finish 450* or *Mapefloor Finish 415 NA*. Spread evenly and uniformly with a rubber squeegee at a depth of 12 mils WFT or a rate of 134 sq. ft. per U.S. gal. (3.29 m² per L) and back-roll to achieve the desired thickness. Apply *Mapefloor Finish 450* or *Mapefloor Finish 415 NA* within 24 hours of application of *Mapefloor PU 400 FC*.
4. Immediately broadcast 16/30 mesh silica quartz sand aggregate – evenly distributed – into the wet coating at a rate of 10 to 15 lbs. per 100 sq. ft. (or 0.49 to 0.73 kg per m²) and back-roll. Allow 8 to 10 hours for curing.
5. Apply an additional coat of *Mapefloor Finish 450* or *Mapefloor Finish 415 NA* at 12 mils WFT or a rate of 134 sq. ft. per U.S. gal. (3.29 m² per L). Broadcast a second layer of 16/30 mesh silica quartz sand into the wet coating at a rate of 10 to 15 lbs. per 100 sq. ft. (or 0.49 to 0.73 kg per m²) and back-roll. Heavy-duty areas should average 44 mils of the basecoat and topcoat combined, excluding the aggregate and primer.

System 4: Extreme-Vehicular (heavy truck traffic, dumpster loading, excessive skid resistance)

1. Apply *Primer SN* at a thickness of 9 to 15 mils WFT or a rate of 107 to 178 sq. ft. per U.S. gal. (2.62 to 4.36 m² per L). OR apply *Mapecfloor PU Primer* at a thickness of 3 to 5 mils WFT or at a rate of 320 to 530 sq. ft. per U.S. gal. (7.84 to 13.0 m² per L).
2. Pour the mixed *Mapecfloor PU 400 FC* onto the surface of the properly prepared substrate and spread it evenly and uniformly with a rubber squeegee at a depth of 20 mils WFT or a rate of 80 sq. ft. per U.S. gal. (1.96 m² per L). Apply *Mapecfloor PU 400 FC* within 6 to 24 hours of application of *Primer SN* or *Mapecfloor PU Primer*. Re-prime if *Mapecfloor PU 400 FC* cannot be applied within 24 hours (contact MAPEI's Technical Services Department for re-priming instructions). Steep slopes may require thinner, multiple passes of coating to achieve the necessary thickness.
3. Allow *Mapecfloor PU 400 FC* to cure for 16 to 36 hours at 75°F (24°C) or until tack-free. Then apply mixed *Planiseal Traffic Coat* and spread it evenly and uniformly with a rubber squeegee at a depth of 20 mils WFT or a rate of 80 sq. ft. per U.S. gal. (1.96 m² per L)*. Back-roll to achieve the desired thickness.
4. After approximately 200 sq. ft. (18.6 m²) of *Planiseal Traffic Coat* is installed, immediately broadcast to refusal the chosen aggregate (see recommended aggregate gradation chart below).
5. Allow the first coat of *Planiseal Traffic Coat* to cure in accordance with the curing schedule shown on the product's TDS. After sufficient curing, sweep the excess aggregate from the installed surface.
6. Apply a second coat of *Planiseal Traffic Coat* at 40 mils WFT or a rate of 40 sq. ft. per U.S. gal. (0.98 m² per L). Once 200 sq. ft. (18.6 m²) of *Planiseal Traffic Coat* has been installed, immediately broadcast the chosen aggregate to refusal into the wet *Planiseal Traffic Coat*.
7. Allow curing in accordance with the curing schedule shown on the product's TDS. Finish the applied system by sweeping all excess aggregate off of the floor.
8. Heavy-duty areas should average 80 mils of basecoat and topcoat combined, excluding aggregate and primer.

* Coverage rates may vary depending on substrate profile.

Typical Aggregate Gradation Chart*

Broadcast Parking-Deck Aggregate Gradation

Mesh Size	Percent Passing
No. 8	100
No. 16	51 to 75
No. 20	14 to 50
No. 30	0 to 25
No. 40	0 to 2

** Note: Aggregate gradation and type may vary depending on intended use of the Mapefloor parking deck system. It is important to consult with MAPEI Technical Services and your local sales representative to determine proper mil thicknesses for the intended aggregate*

Safety, storage and cleanup

Safety

- Ensure that Safety Data Sheets for all system components are present at every jobsite.
- Use extreme caution when working on sloped areas, as wet coatings can be slippery.
- Inform personnel of the potential problems associated with breathing vapors and contact with the material on the skin or in eyes. Provide adequate ventilation, and, at all times, workers should wear protective clothing and have approved chemical-cartridge-type masks available. Footwear must be safety shoes with steel-toe protection.
- Be aware of possible damage to adjacent property. The *Mapefloor* parking deck system may blemish auto finishes and other surfaces such as brick, paint and plastic. Use drop cloths or masking as required.
- Keep all personnel out of areas being coated for 48 hours after the job is completed.
- Seal all air inlets, doorways and windows into nearby occupied areas to prevent vapors from entering these spaces.

- Keep products away from heat, sparks and flame, and disallow spark-producing equipment during application. Post “No Smoking” signs.
- All electrical equipment and outlets must be grounded. Any equipment that could produce a static charge, such as spray guns and compressed air nozzles, must be grounded.
- Have fire extinguishers as prescribed by OSHA within easy access of work areas where solvent coatings are being used. Dry chemical and CO₂ (carbon dioxide) extinguishers are effective in controlling small solvent fires.
- Read 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. Consult the SDSs regarding conditions not addressed here.

Storage

- All components of *Mapefloor* parking deck systems should be stored in cool, shaded areas, preferably at an ambient temperature of 70°F (21°C). Consult each material'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

- Never use solvents that contain alcohol with *Mapefloor* parking deck systems.

General information

- *Mapefloor* parking deck systems are designed to be applied between the ambient temperatures of 45°F to 85°F (7°C to 29°C); for optimum installation, the ambient temperature should be between 70°F and 80°F (21°C and 26°C). Store materials at 70°F to 80°F (21°C to 26°C) for two days before installation and ensure

that the substrate temperature does not fall below 45°F (7°C) when applying polyurethanes, or below 50°F (10°C) when applying 100%-solids epoxies. Colder temperatures will increase the

<u>Area</u>	<u>÷</u>	<u>Thickness</u>	<u>=</u>	<u>Yield</u>
1,604 sq. ft. (39.3 m ²)		25 mils (0.6 mm)		64 sq. ft. per U.S. gal. (1.57 m ² per L)

<u>Area</u>	<u>÷</u>	<u>Yield</u>	<u>=</u>	<u>Thickness</u>
1,604 sq. ft. (39.3 m ²)		100 sq. ft. per U.S. gal. (2.45 m ² per L)		16 mils (0.4 mm)

viscosity of *Mapectfloor* system components and thereby increase the materials' resistance to mixing and flowing, as well as curing times, while decreasing coverage.

- All quantities indicated in this installation guide assume surfaces with an ICRI 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 D4263-83). Allow to dry before application.
- Shotblasting, or other mechanical means approved by the project engineer, is required on all concrete surfaces before application of *Mapectfloor* parking deck systems. Consult a representative from MAPEI's Technical Services Department 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 representative from MAPEI's Technical Services Department.
- Establish a designated area for entering and leaving the installation area. This area should have a removable carpet mat that can be used to clean all dust and debris from footwear. Change the carpet when needed.

- All *Mapecfloor* parking deck system components should be staged for installation by units per 5,000 sq. ft. (465 m²).
- A designated mixing area should be established next to the staging area. The substrate in this area should be protected by drop cloths to ensure that the concrete is not contaminated with unmixed materials before installation.
- The contractor should have backup equipment readily available – such as drill motor, mixing paddles, mixing vessels, caulk guns, squeegees, roller cages and roller covers – to ensure that the application is uninterrupted once it begins.
- It is much easier to use caution or to use drop cloths or masking to keep a coating off an adjacent surface during application, than to remove the coating after it cures.
- Remember that, when priming, *Mapecfloor PU 400 FC* must be applied over the primer within 24 hours; otherwise, repriming is required.
- When repriming, never allow the primer to overlap areas that have been coated with polyurethanes, or separation and blistering may occur.
- When extended UV light exposure is present, use *Mapecfloor Finish 450* as the topcoat.
- Never apply primers or polyurethane elastomeric coatings if rain is imminent.
- Calculating theoretical coverage: Any liquid, when applied at a thickness of 1 mil, will cover 1,604 sq. ft. per U.S. gal. (39.3 m² per L). To determine the yield per gallon/Liter, divide the area by the thickness numbers. Or, to determine the thickness, divide the area by the yield per gallon/Liter.

Examples

Chemical resistance

- *Mapecfloor* parking deck systems are resistant to many common chemicals. These systems are widely used in parking garages, mechanical rooms and other locations where it would be exposed to incidental chemical contact. It is not recommended for long-term ponding water, or for chemical processing areas or industrial secondary containment that would involve long-term exposure to concentrated chemicals.
- Any coating system will stain if not properly maintained. Wash the system surface on a regular schedule to remove dirt, oils and other debris that may damage the coating. Spills of unknown chemicals should be cleaned up immediately, in accordance with local, state/provincial and federal laws. Consult the Maintenance Instructions section in this installation manual.

Resistance to Common Chemicals	
Chemical	Resistance level
# 2 fuel oil	N
Battery acid	S
Blood	N
Brake fluid	S
De-icing salts	N
Ethanol	N
Ethylene glycol	N
Gasoline	N
Hydrochloric acid, < 5%	N
Hydrochloric acid, > 5%	S
Isopropyl alcohol	N
Lacquer thinner	A
Methanol	N
Mineral spirits	N
Motor oil	N
Nitric acid, 10%	S
Skydrol	A
Sodium hypochlorite, 5%	S
Sodium hydroxide, < 40%	N
Sodium chloride	N
Sulfuric acid, > 10%	S
Sulfuric acid, < 10%	N
Toluene	A
Xylene	A

A = Avoid. Clean up immediately if contact occurs.

N = Has no effect. Clean coating regularly.

S = Staining or softening is possible; clean coating frequently to avoid long-term exposure.

Maintenance Instructions

The service life of *Mapecfloor* parking deck systems is very much dependent on periodic visual inspections and planned maintenance, including cleaning, snow and ice removal, and repairs to both the traffic membrane system and concrete substrate. Consult ACI 362.2R-00, "Guide for Structural Maintenance of Parking Structures," for guidelines and conditions not listed.

Inspections

On walk-through inspections, observe and document the general appearance and cleanliness of the installed deck coating, giving particular attention to heavy-wear areas such as ticket booths, ramps and turn lanes. These inspections will form the basis for any preventive maintenance required, and should be performed on both a monthly and a semi-annual basis.

Monthly inspections should include visual assessment of any physical damage to the *Mapecfloor* parking deck system, which should be documented and repaired as deemed necessary. A semi-annual inspection should be more comprehensive and include, but not be limited to, the following:

- Watch for proper flow of water to drains, culverts or scuppers. Identify any stained areas, indicative of standing water, particularly in freeze/thaw climates. Inspect from the underside, if possible, for evidence of cracks or leaks.
- Inspect all existing penetrations and expansion joints to ensure that they are properly sealed and that there is no loss of elastic properties or separation from adjacent substrates.
- Observe critical deck junctures – such as parapet and building walls, curbs, columns and parking bumpers – to determine whether any excessive structural movement may have caused cracking in the *Mapecfloor* parking deck system.
- Look for any tears, cracks or loss of adhesion in the topcoat. Determine whether the membrane is affected or compromised. Observe and document whether any low spots exist where ponding has or could occur.
- Inspect the deck coating for stains from oil, grease or other automotive fluids. Spot-remove such stains with an appropriate cleansing method, such as a general-purpose, oil-removing compound, liquid detergents or caustic soda solutions. Firmly scrub the affected areas to remove all contaminants. Limit the use of high VOC-containing compounds.

- Clean the installed *Mapefloor* parking deck system with a 1,200-psi pressure washer and detergent to remove surface debris as well as any residual liquid contaminants. A stiff-bristle broom or scrubbing machine may be used for areas with excessive buildup or on areas that are difficult to clean. Rinse the deck thoroughly with clean, potable water and vacuum-dry to remove loose contaminants. Collect and dispose of effluent waste in accordance with local, state/provincial and federal regulations.

Snow and ice removal

Piled snow and ice can significantly increase the load capacity on parking decks, sometimes exceeding the deck's design load. This overloading can cause structural cracks in the deck substrate and subsequent failure in the traffic deck membrane system. Some precautionary measures can help in maintaining your parking deck system, as follows:

- Remove all piled snow and ice accumulated as soon as practically possible.
- Avoid the use of uncovered metal blades on snow plows to prevent physical damage to *Mapefloor* parking deck systems. A heavy rubber blade edge should be mounted to the metal edge of the plow blade to protect the surface. In addition, care should be taken to protect expansion joint systems, with plowing done at a 45-degree angle to the joint so that the blade does not get caught up in the joint opening. All vehicles with chains and studded tires should be prohibited.
- Sand or other grit, such as rock salt, should not be used to improve traction on the installed *Mapefloor* parking deck system.
- Calcium magnesium acetate may be used as a de-icing chemical.

For additional information, refer to the following reference material: Parking Garage Maintenance Manual, Fifth Edition (available from the National Parking Association in Washington, D.C.).

Repair procedures

Adhesion testing: Always perform field-adhesion tests on a mockup sample before recoating an entire existing coating system. The ASTM D4541 test for “pull-off” strength is a good standard for measuring adhesion, particularly if there is a question of compatibility between two different coating systems. Another field test involves the use of a fiberglass or similar fabric. Prime the affected area with *Primer SN* or *Mapefloor PU Primer*, allow curing, and then apply *Mapefloor PU 400 FC* basecoat. Work the fabric into the wet *Mapefloor PU 400 FC*, allowing a 6" (15 cm) piece of fabric to remain unattached. After *Mapefloor PU 400 FC* cures, pull back on the unattached end of the fabric toward the test area to get a qualitative indication of bond strength (without value).

Reflective cracking: Routinely inspect the existing coating for reflective cracks, or cracks occurring directly over underlying cracks or joints. Remove any unbonded coating along the length of the crack. Rout out the crack, clean the walls of the crack with a solvent and bevel the edge of the bonded coating alongside the crack. Caulk the joint with a polyurethane sealant flush with the concrete surface. After the caulking has cured, prime the sealant, exposed concrete surface and bonded coating with an appropriate rebond primer. Once the rebond primer has cured per manufacturer directions, apply the appropriate *Mapefloor* parking deck system as directed in the instructions for System 1, System 2, System 3 or System 4.

Coating delamination: Remove any loose, unbonded coating and inspect the concrete surface as well as the back of the delaminated coating. Check the concrete surface for soundness and the back of the delaminated coating to determine the cause of delamination. Typically, the failure is caused by poor or inadequate surface preparation, surface cleanliness, insufficient thickness of one (or more) of the coating during initial application, or a missed open-time window on the primer or the basecoat. After determining the cause and appropriate corrective measures, proceed with the steps outlined in the paragraphs below titled "Aggregate loss and wear-through."

Blistering: When a concrete deck is damp or wet during initial application, or if the deck is damp between application of the primer, basecoat or topcoat, blisters caused by escaping moisture may occur. When these blisters are cut open, there will be a trace of moisture under them or, at the least, a water mark on the back of the blister itself. Blisters should be cut out to release the escaping moisture and, when the surface is dry, appropriate repairs should be made.

When a concrete deck has been shotblasted, pinhole blisters may occur. The surface preparation opens up the concrete surface, creating tiny holes and air pockets, and outgassing can occur anywhere in a *Mapefloor* parking deck system. When a polyurethane coating is applied and bridges these holes, the trapped air expands and causes small blisters in the coating. Reduce the occurrence of blisters by allowing the newly mechanically prepared deck to outgas for 16 to 48 hours after preparation. If this timeframe cannot be accommodated before application, apply two coats of primer or slightly increase the amount of primer and always apply the basecoat late in the day when the deck is cooler and the heat of the day has passed (for specific temperatures, see the Installation Instructions guide in this manual).

Lastly, apply the basecoat in multiple thinner coats to achieve the proper thickness. Applying a *Mapefloor* parking deck system in thinner coats can reduce this occurrence. Random use of a “wet film mil” gauge during application can verify that proper coverage rates are accomplished.

Aggregate loss and wear-through: Loss of aggregate in heavy-traffic areas, such as ticket booths, turn lanes and ramps, can be expected over time. In these heavy- traffic areas, the topcoat may begin to show wear-through and possibly delaminate from the basecoat over time.

When underlying coats of a *Mapefloor* parking deck system are worn through to an exposed concrete substrate, mechanically clean these areas with a power wire brush or light scarification to achieve a roughened surface, prime the affected area, and apply a basecoat and topcoat as required. When aggregate has been lost, or when underlying coats of a *Mapefloor* parking deck system are exposed, prime with an appropriate rebond primer. Perform a test section to ensure that the appropriate rebond primer does not wrinkle the existing coating. If this happens, apply the mixture as thinly as possible.

Once the rebond primer has cured per manufacturer directions, apply the appropriate *Mapefloor* parking deck system as directed in the instructions for System 1, System 2, System 3 or System 4.



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