



WARM TEMPERATURE CONCRETE REPAIR GUIDELINES

BEST PRACTICES

Refer to the **SLOW-SET ADMIX USAGE CHART** on the third page of this document!

Phoscrete provides an effective concrete repair solution for rapid repairs in all ambient temperatures. Phoscrete MPC (Magnesium-Phosphate-Cement) concretes set faster in warm temperatures.

- **PHOSCRETE FORMULA 1 [MALP Series]** concretes do not mix with water, but instead mix with a Liquid Activator and provide 10 minutes working time at 70°F (21°C). F1 concretes are typically traffic-ready in less than 1 hour.ⁱ
- **PHOSCRETE FORMULA 3 [MKP Series]** concretes mix with water and provide 20 minutes working time at 70°F (21°C). F3 concretes are typically traffic-ready in less than 3 hours.ⁱⁱ

Key to a successful Phoscrete installation is having sufficient working time to place and finish the mixed material. Once finishing is completed, Phoscrete's repair surface can be ground and/or sealed as soon as the exothermic reaction begins to cool.

Both Phoscrete MPC concrete formulas are well suited to warm temperature applications, with additional working time achieved by **chilling the Liquid Activator (MALP) or chilling the Water (MKP)**.

**When working in temperatures between 70° - 90°F,
cool jugs of Phoscrete Activator or cool Water to 40°F.
Begin cooling Activator 4 hours prior to mixing.**

PHOSCRETE F1 [MALP Series]: Best Practices for Cooling Activator to 40°F (5°C)

Phoscrete Activator can be chilled with ice in a large (150 qt) insulated cooler (available from Phoscrete).

Add 40 lbs. ice on top of 16 jugs of Liquid Activator to cool from 85°F (30°C) to 40°F (5°C) in [4] hours.

In ambient temperatures of 85°F (30°C), the Liquid Activator temperature begins to rise approximately 5°F per hour after [4] hours (see Time to Cool chart below).

SUPERCOOLING F1 [MALP Series] Liquid Activator to 10°F (-12°C)

The freezing point of Phoscrete Activator is -17°F (-27°C). Using a 7 cf Chest Freezer, 16 jugs of activator will cool from 85°F (30°C) to under 10°F (-12°C) in approximately 24 hours. A 15cf Chest Freezer can supercool 48 jugs. Transfer jugs to insulated coolers with ice before travelling to job site.

PHOSCRETE F3 [MKP Series]: Best Practices for Cooling Water to 40°F (5°C)

Fill a large, insulated cooler (available from Phoscrete) with water and ice. A 150-quart cooler holds enough ice water to mix more than 32 bags of Phoscrete Formula 3E-HC and more than 60 bags of Phoscrete Formula 3E-VO.

Fill Phoscrete's water pitcher under the drain spigot on the side of the cooler to the measure line.



Considerations when working with Phoscrete concretes in warm temperatures:

On the job site, many factors impact working and set times, including:

<ul style="list-style-type: none"> • Ambient temperature • Substrate temperature 	<ul style="list-style-type: none"> • Liquid Activator temperature • Dry Mix temperature 	<ul style="list-style-type: none"> • Volume of material placed
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Most important is the temperature of the Dry Mix and the Liquid Activator (F1) or water (F3). When the two components are mixed at cooler than ambient temperature additional working time is gained.

The next important consideration is the temperature of the substrate. If the substrate is significantly hotter than Phoscrete’s two components, working time is reduced.

Unlike conventional Portland cement-based repair materials, Phoscrete bonds strong to itself, wet or cured, with no cold joints. The entire patch does not need to be poured and finished all at once.

When Phoscrete MPC concretes are mixed, an exothermic reaction occurs, and the placed material gets very hot, oftentimes reaching a temperature greater than 150°F (70°C). Large volumes of material placed will reduce working time.

On large area pours, install in horizontal or vertical lifts. To get the best finish, wait for the material to set and begin to cool down before mixing and placing the final lift.

- Keep the cooler with Liquid Activator jugs closed, and the Dry Mix bags out of direct sunlight until site preparation is complete and you are ready to mix.
- Save the coldest jugs of Liquid Activator for the final lifts to get the best finish.
- **Minimum thickness for final horizontal lift (HC) is ½ inch. Phoscrete VO may be feather finished.**
- Use a temperature gun. Wait until the material begins to cool before grinding or sealing.
- Always take time for quality site preparation. Phoscrete requires a clean, dry, and structurally sound concrete substrate for successful long-lasting concrete repairs
- Remove slurry from saw-cuts that may inhibit bond between Phoscrete and substrate.

Basic instructions for mixing Phoscrete in a bucket and using Slow-Set Admix

- Empty the entire contents of chilled Liquid Activator (F1) or Water (F2) into the bucket.
Always add liquid first!
- Add the appropriate number of level scoops of Slow-Set Admix into bucket.
- Next add appropriate measure of Endure Admix to the liquid (F1E and F3E).
- Finally, add the entire Dry Mix bag to the liquid, and mix for approximately 1 minute or until no dry material remains. **Do not over mix!**
- Refer to the [Phoscrete Full Installation Guides](#) for complete mixing/finishing instructions



Slow-Set Admix Usage for Phoscrete MPC Concretes

Scoops are provided with all Phoscrete Admixtures. **Be careful to use the correctly labeled scoop!**

Phoscrete Slow-Set Admix Scoop Sizes

Packaging	Lbs	Kg	Slow-Set Scoop (1/4%)	
			grams	scoop label
F1/F3 HC Pail	9.7	4.4	11	[A] 10 cc (0.33 oz)
F1/F3 HC Pail	55	25	62	[B] 53 cc (1.8 oz)
F3-VO Bag	27	12.2	32	[C] 30 cc (1 oz)

This usage chart recommends the number of scoops of Slow Set Admix to use and time traffic opening.

Phoscrete Slow-Set Admix Usage Chart

Temperature after Mix	PHOSCRETE FORMULA 1 [MALP]			PHOSCRETE FORMULA 3 [MKP]		
	F1 Admix Scoops	F1 Set (Minutes)	Traffic Ready [†] (min)	F3 Admix Scoops	F3 Set (Minutes)	Traffic Ready [†] (min)
50°F to 70°F [10°C to 20°C]	None	10-15	30-60	None	15-20	120-180
70°F to 85°F [20° to 30°C]	1 Slow-Set	10-12	30	1 Slow-Set	20-30	90-120
85°F to 95°F [30°C to 35°C]	1-2 Slow-Set	7-11	15	1-2 Slow-Set	20-30	90-120
Above 95°F [Above 35°C]	2-4 Slow-Set	6-8	12	2 – 4 Slow-Set	20-30	90-120

[†] Phoscrete F1 [MALP Series] concretes typically achieve compressive strengths of 4,000 psi in less than 1 hour. Phoscrete F3 [MKP-Series] concretes typically achieve compressive strengths of 4,000 psi in less than 3 hours. FHWA advises >2,000 psi to open a repaired concrete road or bridge deck to heavy-duty rubber-tire traffic.

Never add more than 4 scoops of Slow-Set Admix per Bag of Dry Mix!

Set Time is when Phoscrete is hardened to the point that a nail cannot be pressed into the material.

If you have questions, contact your local Phoscrete representative or call our corporate offices for application assistance.

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ⁱⁱ Phoscrete F3 [MKP] concretes typically achieve compressive strengths of 4,000 psi in less than three hours.

FHWA advises >2,000 psi to open a repaired concrete road or bridge deck to heavy-duty rubber-tire traffic.