



# COLD TEMPERATURE CONCRETE REPAIR GUIDELINES

## BEST PRACTICES

Refer to the **FAST-SET ADMIX USAGE CHART** on Page 2 of this document.

Phoscrete MPC (Magnesium-Phosphate-Cement) concrete formulas set fast, even in cold temperatures.

PHOSCRETE FORMULA 1-HC [MALP-Series] concretes do not mix with water, but instead mix with a pre-measured Liquid Activator and work in temperatures above as the activator's freezing point:  $-10^{\circ}\text{F}$  ( $-23^{\circ}\text{C}$ ).

PHOSCRETE FORMULA 3 [MKP-Series] concretes mix with jugs of pre-measured water plus Endure, and work in temperatures above the freezing point of water:  $32^{\circ}\text{F}$  ( $0^{\circ}\text{C}$ ). **DO NOT USE FAST-SET ADMIX WITH Phoscrete F3!**

Use **Phoscrete Fast-Set Admix** (accelerator) with Phoscrete F1 [MALP-Series] concrete repairs to quickly achieve traffic ready<sup>†</sup> strength, even in sub-freezing temperatures.

### Considerations for working with Phoscrete MPC in cold weather:

On the job site, temperature impacts working and set times, in this order of priority:

1. Liquid Activator	2. Dry Mix	3. Substrate
4. Volume of Material	5. Ambient	

**Most important is the temperature of the Dry Mix and the Liquid Activator.**

**Warm Liquid Activator and Dry Mix prior to mixing whenever possible.**

When the temperature of Phoscrete F1 components are warmer than ambient temperature, less Fast-Set is required.

When the temperature of Phoscrete F3 components are below  $59^{\circ}\text{F}$  ( $15^{\circ}\text{C}$ ), it becomes harder to mix. Phoscrete recommends using large buckets (8-gallon, available from Phoscrete) for faster and easier mixing in cold temperatures.

The third important consideration is the temperature of the substrate. Frozen concrete acts as a heatsink, delaying the exothermic reaction between the Dry Mix and the Liquid Activator, and slowing the set time.

In cold storage facilities and/or cold climates, heating the substrate allows the exothermic reaction to set faster. Use a propane torch and gently "kiss" the substrate surface prior to placement of Phoscrete to evaporate moisture and ice crystals and warm the surface. *Do not heat the substrate for an extended period to avoid loss of compressive strength!* Placed Phoscrete may also be gently heated to accelerate the set.

When Phoscrete Dry Mix and Liquid Activator are mixed, an exothermic reaction occurs, and the material gets very hot. When large volumes of material are placed in lifts, use less Fast-Set Admix on the final lifts (F1 only).

Note that the heat from Phoscrete's exothermic reaction may allow use of sealants below the low-end temperature of their recommended range. Be sure to keep sealants warmed prior to use.

### Basic instructions for mixing Phoscrete in a bucket or pail using Fast-Set Admix:

- Only apply Phoscrete MPC to clean, dry concrete substrates.
- Remove slurry from saw-cuts that may inhibit bond between Phoscrete and substrate.
- Empty the entire contents of Liquid Activator into the bucket. **Always add liquid first!**
- Add the appropriate number of level scoops of Fast-Set Admix into bucket (F1 only).
- Finally, add the entire Dry Mix bag to the liquid, and mix for approximately 2 minutes or until no dry material remains. **Materials take longer to mix when cold!**
- When placing and finishing Phoscrete in cold temperatures, use a pencil vibrator to increase the material's flow.
- Refer to the [Phoscrete Full Installation Guides](#) for complete mixing/finishing instructions.



# Fast-Set Admix Usage for Phoscrete Formula 1 Concretes

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

## Phoscrete Fast-Set Admix Scoop Sizes

Packaging	Lbs	Kg	Fast-Set Scoop (1/4%)	
			grams (.25%)	scoop label
<b>F1-HC/HF Large Bag</b>	50	22.7	<b>57</b>	<b>[A] 43 cc (1.45 oz)</b>
<b>F1-HC/HF Small Bag</b>	22	10	<b>25</b>	<b>[B] 20 cc (0.67 oz)</b>

This usage chart recommends the number of scoops of Fast Set Admix to use and time traffic opening. When material is warmed prior to placement, less Fast-Set Admix is needed.

## Phoscrete Fast-Set Admix Usage Chart

Liquid/Dry Temperature	PHOSCRETE FORMULA 1-HC [MALP]			PHOSCRETE FORMULA 3 [MKP]
	HC Admix Scoops	HC Set (Minutes)	Traffic Ready <sup>†</sup> (min)	<b>DO NOT USE FAST-SET</b>
Below +15°F [Below -10°C]	<b>8 - 10 Fast-Set</b>	30	75+	Phoscrete F3 [MKP-Series] concrete is not recommended for use in temperatures below the freezing point of water unless water is heated, and dry mix and substrate are warmed. Do not use Fast-Set Admix with Phoscrete F3 concretes.  When mixing F3 in temperatures below 59°F (15°C), use a large 8-gallon bucket (available from Phoscrete), and use a pencil vibrator (available from Phoscrete) to move the material for the fastest and best mix and finish.
15°F to 25°F [-10° to -5°C]	<b>6 - 8 Fast-Set</b>	20	60	
25°F to 32°F [-5°C to 0°C]	<b>4 - 6 Fast-Set</b>	20	60	
32°F to 40°F [0°C to 5°C]	<b>2 - 4 Fast-Set</b>	17	60	
40°F to 50°F [5°C to 10°C]	<b>1 - 2 Fast-Set</b>	15	60	
50°F to 70°F [10°C to 20°C]	None	10-15	30-60	

<sup>†</sup> Phoscrete F1-HC [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 10 scoops of Fast-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.**