



## PHOSCRETE FORMULA 3 [MKP-SERIES]

### MIXING INSTRUCTIONS FOR MATERIALS LABS

*The cementitious product you are about to mix is not a traditional Portland cement-based material and cannot be mixed exactly per ASTM protocols.*

Phoscrete Corporation manufactures PHOSCRETE FORMULA 3 (**F3**) MKP Series concretes (Magnesium Potassium Phosphate) that require mixing the dry component (Formula 3 Dry Mix) with a pre-measured liquid activator (F3 Activator).

#### Important things to know when working with PHOSCRETE FORMULA 3 [MKP Series]

- **Phoscrete MKP Series concretes are fast setting.** Working time at lab temperature is approximately 15-20 minutes with initial set almost immediately thereafter. MKP concretes will harden sooner at the surface once you stop vibrating or working the material with a trowel.
- **Always mix the appropriate color-matched and labeled, pre-measured F3 Activator with the F3-Dry Mix.** Formula 3 is packaged in large & small bags plus jugs.
- **Do NOT mix partial bags and jugs of Phoscrete F3.** Phoscrete activators contain liquids with different densities. Jugs and jars must be completely emptied for use with the matching pre-measured dry mix. *If your materials office prefers to use smaller quantities with lab mixing equipment, contact Phoscrete so we can provide you with the appropriate measure of F3 Activator in jars.*
- **Always add F3 Activator first into an empty pail** when mixing. Next add Phoscrete Admixtures, including Fast-Set, Slow-Set, or Fibers. Then blend in the matching F3 Dry Mix powder.
- **Do NOT extend Phoscrete F3 with aggregates or sand.** Phoscrete is pre-extended.
- **Use a sufficiently powered heavy-duty drill or mixer designed for mixing concrete materials in a bucket.** Phoscrete recommends the Bosch GBM9-16 mixing drill (9-amp, ½" chuck with side handle).
- **Use Phoscrete Urethane Mixing Augers** (Small and Large). They are excellent tools for fast and easy mixing of Phoscrete in a bucket.
- **Larger buckets mix large bag kits of Phoscrete faster.** Phoscrete recommends the Collomix 8-gallon tall bucket. Collomix products are available from Phoscrete.
- **Do not under-mix Phoscrete F3.** Mix for at least two [2] minutes (mix longer when materials are cold) and until fully wetted out (no dry material remains). F3-HC is flowable, and F3-VO mixes to a putty consistency. Then, place and finish immediately.
- **Phoscrete F3 concretes prefer a dry substrate for strongest bond.** Phoscrete F3 concretes can be installed on SSD (Saturated Surface Dry) substrates with approximately 25% reduced bond strength.
- **PHOSCRETE ENDURE™** is a component of F3 Activators and is also applied to Phoscrete F3 concretes after set for curing.
- Dampen gloves and wipe down tools with water (and shake off) for ease of placement and best finish, but do not pour water directly on wet Phoscrete.
- Clean tools, buckets, clothing, and boots with water. Clean hands with soap and water.



**PHOSCRETE MKP Series concretes are self-consolidating and thixotropic.** For best performance, use vibration (vibrating table or pencil vibrator) to increase flow and reduce air bubbles when casting forms and bonding to substrates.

**Best to use plastic molds** (HDPE, Plexiglas, etc.) because MKP Series concretes bond and react to metals. If you are using metal molds, do not use galvanized metal because MKP Series concretes react with zinc, producing H<sub>2</sub> gas. Metal molds can enhance consistency in sample formation and yield higher compressive strengths owing to their heat retention properties. However, it is imperative to coat them with a suitable release agent to facilitate proper demolding and prevent damage to both the cubes and molds. Improper coating may cause damage to the mold. Phoscrete recommends [Super Lube<sup>i</sup>](#), a food grade multipurpose synthetic grease. *Do not use release agents for bond tests!* Contact Phoscrete to verify compatibility if you wish to use a different release agent.

**Treat samples with provided Phoscrete Endure as a curing compound immediately following de-molding.** Phoscrete Endure is an SME-PS durability enhancer that acts as a curing compound to prevent evaporation of the liquid in the mixed material prior to full cure. Upon demolding (no sooner than 2.5 hours), generously spray or paint Endure on all exposed faces of the Phoscrete F3 samples at a coverage rate of 160 sf per gallon. Allow Endure to penetrate for 2.5 additional hours or until the surface is dry. Blot off excess Endure with a paper towel before storing or proceeding with any tests.

**Cylinder molds for bond and compressive strength tests:** Phoscrete MKP Series concretes bond strongest to a dry concrete substrate. Do not apply to an SSD substrate surface unless required by the Materials Testing Office Standard Specifications. It is important to grind or wet sawcut the top of the hardened sample until level. Otherwise, the testing machine will not exert uniform stress over the contact surface of the sample, resulting in potentially inaccurate readings. This is particularly true for slant shear bond (C882). Phoscrete can be sawcut or ground as soon as 15 minutes following final set.

**Grinding Edges to Remove Fins or Thinning—Guidelines:** Grinding edges of mortar or concrete specimens to remove fins or thin sections is acceptable for both lab testing and field repair. ASTM C109 recommends that cube specimen faces should be ground or remade to ensure flat, uniform surfaces for accurate compressive strength testing. This practice ensures that the results reflect true material strength without weak or poorly formed sections compromising integrity.

Unless otherwise specified by the material testing office, produce substrates for bond tests such as ASTM C882 and ASTM C1583 with dry Ottawa sand mortars. Prepare the substrate to minimum CSP-6 per ICRI specifications and vibrate Phoscrete into place.

***Do not wet cure or moist cure PHOSCRETE MKP concretes before 3 days air cure.***

The manufacturer recommends the Lab Manager call and speak with Phoscrete's General Manager or Phoscrete's Quality Control Manager (see below) prior to mixing, to answer any questions and review the mixing/handling procedures the Lab plans to use.

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<sup>i</sup> <https://www.super-lube.com/multi-purpose-synthetic-grease-with-syncolon-ptfe/>