



PHOSCRETE® HC (Horizontal/Castable)

Very Rapid Hardening MALP (Magnesium Alumino Liquid Phosphate) Concrete for full and partial depth horizontal and castable concrete repairs.

DESCRIPTION

Phoscrete HC is a cementitious two-part kit of dry mix composed of Magnesium and Aluminum Aggregates, Reinforcing Fibers, plus a Liquid Phosphate Activator. Phoscrete is very rapid hardening, and gains strength suitable to vehicular traffic in less than one hour at moderate ambient temperatures. Phoscrete forms both a chemical and a mechanical bond to cured concrete and to itself, wet or cured.

PROVEN APPLICATIONS

- Full depth and partial depth concrete repairs
- Interior and exterior concrete installation and repairs
- Horizontal surfaces: poured/castable applications
- Vertical and overhead surfaces: form and pour applications
- Bridge deck and parking deck repairs of reinforced concrete
- Highway concrete spall and rutting repairs
- Airport runway and apron concrete repairs
- Dowel bar retrofit, pre-cast joint grouting, bearing locations
- Freezer floors, industrial floors, and loading dock repairs
- Expansion joint nosing construction and repairs

ADVANTAGES

- Labor saving material: no primers, no curing compounds, no sandblasting of steel bars, self-consolidating, fast setting, easy clean up with water.
 - Easy and accurate mixing: two components, powder + aggregates in a bag and liquid in a jug. No water, neat mix.
 - Rapid return to service: achieves 4,000 psi compressive strength and 1,500 psi bond strength 1 hour following placement at 73°F.
 - Fiber reinforced: high flexural strength, ductility, and durability.
 - No cold joints: both mechanical and chemical bond to clean cured concrete. Phoscrete also bonds to itself with no cold joints.
 - Shrinkage crack free, per ASTM C1581 Restrained Shrinkage (Ring) Test.
 - Stops rust: converts iron oxide to metal phosphate; inhibits further corrosion.
 - Does not out-gas after cure: accepts sealants and polymer coatings as soon as one hour following initial set.
 - Freeze-thaw resistant, and salt scaling resistant: even when exposed to $MgCl_2$ and $CaCl_2$.
 - Resists chloride penetration.
 - Chemically stable: no added chlorides, no added sand or aggregates.
 - Not a vapor barrier: allows on grade applications.
 - Environmentally friendly: no odor, no free silica.
 - All temperature use: same formula works from -5°F to +85°F
- when used with Phoscrete Fast Setting Admixture in cold temperatures.
-contact Phoscrete technical support to discuss your specific application.

PACKAGING

1 Kit = 1 bag + 1 Jug

Dry Mix Bags: 55 lb. (25 kg)
polyethylene-lined bags

Liquid Activator Jugs:

10.4 lb. (4,72 kg) HDPE plastic jugs
48 kits per pallet **Kit Yield:** 0.47 ft³
(0,0133 m³) neat mix Do not extend
with aggregate.

Pail: 13.4 lb. (6 kg)

HDPE pail contains Dry Mix
paper bag and HDPE Liquid
Activator jar. **Pail Yield:** 1.0 bf
(144 in³, 0.0024 m³)

Patch Kit Tub: 1.1 lb. (0.5 g)

HDPE Patch Kit Tub contains
zip plastic Dry Mix bag
LDPE Liquid Activator jar
plus plastic mixing stick.

Fast-Set Admix:

Kit: 0.25 lb. (113 g) per dose
(two 3-oz. scoops by volume)

Pail: 0.7 oz. (20 g) per dose
(two tablespoons by volume)

Tub: 0.12 oz. (3.3 g) per dose
(two ½ teaspoons by volume)

Mixing Ratio

Mix Entire Kit: 1 jug+1 bag

Wet-To-Dry Ratio: 18.5%

Storage

Store in unopened, original packaging
in clean, dry conditions.

Shelf Life

Dry Mix: 24 months

Liquid Activator: 12 months
(when properly stored)

VOC Content

0 g/L less exempt solvents

Color

Concrete Grey

Fresh Properties					
Test	Specification	Description	Time	Typical Results	
Set Time	ASTM C266	Time of Setting by Gillmore Needles	Initial Final	18 min	28 min
Slump	ASTM C143	Slump of Hydraulic-Cement Concrete	0 5 15 min	6 in (15cm)	4 in (10cm) 0 in (0cm)
Yield and Density	ASTM C387	Yield and Density (Unit Weight) of Concrete	ft ³ lb./ft ³ (m ³ kg/m ³)	0.47 (0,0133)	138.2 (2214)
Air Content	California CT-504	Air Content of Freshly Mixed Concrete		11.5%	
Free Shrinkage	ASTM C157	Length Change of Hardened Concrete (Std)	28 Days Wet Dry	0.00%	-0.03%
Restrained Shrinkage	ASTM C1581	Age at Cracking and Induced Tensile Stress Characteristics under Restrained Shrinkage	180 Days Age Stress	Did Not Crack	-60 µstrain
Strength Properties					
Test	Specification	Description	Time	Typical Results	
				psi	MPa
Compressive Strength	ASTM C109	Compressive Strength of Hydraulic Cement Mortars Using 2-in. Cube Specimens	1 hour	4000	27,6
			1 day	5500	37,9
			28 days	7000	48,3
Flexural Strength	ASTM C78	Flexural Strength of Concrete Using Simple Beam with Third-Point Loading	1 hour	400	2,8
			1 day	500	3,5
			7 days	600	4,1
			28 days	700	4,8
Bond Strength	ASTM C882	Bond Strength by Slant Shear Phoscrete - Concrete	1 hour	1500	10,3
			7 days	2000	13,8
			28 days	2500	17,2
		Bond Strength by Slant Shear Phoscrete - Phoscrete	1 hour	1750	12,1
			7 days	2500	17,2
			28 days	3000	20,7
Tensile Strength	ASTM C496	Splitting Tensile Strength of Cylindrical Concrete Specimens	1 day	650	4,5
			28 days	800	5,5
Modulus of Elasticity	ASTM C469	Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression	28 days	3.1E+06	21E+06
				0.274	
Durability Properties					
Test	Specification	Description	Test	Typical Results	
Freeze Thaw	ASTM C666-A	Resistance of Concrete to Rapid Freezing and Thawing in a Saturated Condition (300 cycles)	Durability Factor	94%	
Scaling	ASTM C672	Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals (25 cycles) Results = Visual Material Loss lbs./ft ²	NaCl	0	0.00
			CaCl ₂	0	0.00
			MgCl ₂	0	0.00
Chlorides	ASTM C1202	Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration (Current @5 min)	28 days	1331 C	36.2mA
	ASTM C1543	Penetration of Chloride Ion into Concrete by Ponding	90 days	10-20 mm	0.135%
				55-65 mm	0.117%
			180 days	10-20 mm	0.195%
				55-65 mm	0.145%
Abrasion	California CT-550	Determining the Surface Abrasion Resistance of Concrete Specimens (mass loss)	24 hours	16 g	1.8%

SURFACE PREPARATION

- No primer is required.
- Concrete must be sound and fully cured.
- Loose, damaged and contaminated concrete must be removed.
- Clean the surface of the area to be repaired from oil, grease, and other bond-inhibiting materials.
- Surface must be dry, free of standing water. Use heat (torch) and/or a scrub coat to eliminate surface moisture.
- Remove rust from steel bars with a wire brush. Sandblasting is not required.
- Replace reinforcing bars that have lost 25% or more of their original diameter with new bars spliced in place, lapping sufficiently to transfer stress.
- Concrete profile should reach CSP of 7-9 per ICRI Guidelines.
- Repair area should not be less than 1-inch deep.
- Saw-cut the edges of the repair area insuring at least 1-inch depth.
- Saw-cut the edge of the repair parallel and perpendicular to traffic to limit the number of load-bearing stress points.

MIXING

- Mix Phoscrete HC at the placement site.
- Use a heavy-duty five-gallon bucket for mixing single kits of Phoscrete HC. Mix with a paddle (Phoscrete's urethane auger highly recommended), using a dual or variable speed drill (minimum 7-amp drill, ½" chuck with side handle).
- Use a paddle-style mortar mixer for mixing multiple kits at once, when placing large quantities (>2 yd³) of Phoscrete HC.
- Pour Phoscrete HC Liquid Activator in a clean bucket or mortar mixer. Add Phoscrete HC Dry Mix to the Liquid Activator, preferably while mixing.
- Mix Phoscrete HC Dry Mix into the liquid for about 1 minute, until the material is fully wetted out. Do not over-mix.
- When using a mortar mixer, add at least 2 jugs of Phoscrete Liquid Activator in the empty mixer immediately after pouring a batch of mixed material. Allow the mixer to spin to prevent the set of any material remaining in the mixer. Do not use water for equipment cleanup until all batches of Phoscrete HC are mixed and placed.
- A batch of Phoscrete HC must be mixed, placed and finished within 5 - 15 minutes depending on ambient temperature.
- The mix ratio is 18% Wet to Dry. On-site measurement for partial unit mixing is NOT recommended. Inaccurate measurements will lead to poor material performance.
- In cold climates, when ambient temperature is below 50°F (10°C), pour Phoscrete Fast-Set Admixture into liquid. Refer to cold temperature guidelines at phoscrete.com. Then add the Phoscrete HC dry mix bags and mix as usual.
- In hot climates above 75°F, chill Phoscrete Liquid Activator on ice to extend working time. Refer to warm temperature guidelines at phoscrete.com.

APPLICATION

- Empty the mixing container of Phoscrete HC immediately after mixing is completed.
- Install immediately after mixing. Discard the batch if the material begins to setup in the pail or mixer.
- Using a trowel or float, work Phoscrete HC into the bottom and sides of the patch, being careful to fill all voids. Force the material against the edges of the repair.
- Level Phoscrete HC to the existing concrete surface. Screed off excess. Phoscrete may expand slightly so finish the surface to accommodate for expansion. If the material finishes higher than the adjacent surface, to reduce impact on the repair and for rideability, use a diamond grinder to level surface as soon as 15 minutes following initial set.
- Finish Phoscrete HC using clean concrete floats and trowels. Magnesium floats work best. Tap on surface with trowel to bring liquid to the surface for best finish. Clean Phoscrete from trowels with a water-dampened cloth. Do not pour water on repair. Stop finishing once the surface of the placed material develops a "skin".
- When using forms, apply vibration for maximum penetration and bond.
- When multiple layers are applied, scarify the surface for best bond. Phoscrete bonds to itself whether or not it is completely set. If installing in lifts, do not apply a final layer thinner than ½ inch.

APPLICATION *(continued from page 3)*

- If rain occurs prior to initial set, cover the surface with plastic sheeting for at least 15 minutes following initial set.
- On sloped surfaces, pour the material at the bottom of the slope and work your way up. Use a hand screed to move the material up the slope. When installing on steep inclines, use forms, or work in smaller increments (one kit at a time), and allow the material to setup prior to the next pour.
- For expansion joint nosings, insure that the repair material is not higher than the approach slab. Use a grinding tool to cut a 45° bevel at the edge of the joint no sooner than 15 minutes after initial set. Standard compression or silicone seals can be applied no sooner than one [1] hour following initial set. Refer to expansion joint guidelines at phoscrete.com.
- No curing compound is required.

CLEANING

- In-between batches, clean tools with water and wipe off excess water prior to contact with Phoscrete.
- When the job is completed, clean tools with water.

LIMITATIONS

- Minimum application thickness: 1-inch
- Maximum application thickness: none
- Do not apply Phoscrete HC as a thin veneer.
- Minimum ambient temperature: -5°F
- Do not use water when mixing and/or placing Phoscrete HC
- Do not extend Phoscrete HC with aggregate.
- Do not add sand and/or any type of cement.
- Do not use water when finishing Phoscrete HC.
- No direct contact with galvanized steel or aluminum.
- Proper application is the responsibility of the user. Field visits by Phoscrete personnel are for the purpose of making technical recommendations, not for supervising or providing quality control on the jobsite.

LIMITED WARRANTY

LIMITED WARRANTY NOTICE Phoscrete Corporation (Phoscrete) warrants this product to be free from manufacturing defects and to meet the technical properties on the current Technical Data Guide, when used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many factors beyond Phoscrete's control. PHOSCRETE MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is the replacement of product or refund of the purchase price, at the sole option of Phoscrete. Any claims concerning this product must be received in writing within one (1) year from the date of shipment and any claims not presented within that period are waived by Purchaser. PHOSCRETE WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND. Purchaser must determine the suitability of the products for the intended use and assumes all risks and liabilities in connection therewith. This information and all further technical advice are based on Phoscrete's present knowledge and experience. However, Phoscrete assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights, nor shall any legal relationship be created by or arise from the provision of such information and advice. Phoscrete reserves the right to make any changes according to technological progress or further developments. The Purchaser of the Product(s) must test the product(s) for suitability for the intended application and purpose before proceeding with a full application of the product(s). Performance of the product described herein should be verified by testing and carried out by qualified experts.

HEALTH, SAFETY, AND ENVIRONMENTAL

Read, understand and follow all Installation Instructions, Safety Data Sheets, and product label information for this product prior to use. The latest SDS can be obtained by visiting phoscrete.com, emailing your request to info@phoscrete.com, or calling 561-420-0595. Use only as directed. 24 Hour Emergency: Chemtrec® 800-424-9300 Contracted by Phoscrete/Stellar Materials, Account #205681.