



PHOSCRETE® SG (Dry-Mix Shotcrete/Gunite)

Rapid Hardening MALP (Magnesium Alumino Liquid Phosphate) concrete for Dry Process Shotcrete / Gunite applications.

DESCRIPTION

Phoscrete SG is a cementitious two-part system of Dry Mix composed of magnesium and alumino aggregates, reinforcing fibers, plus a Liquid Phosphate Activator. The two components are pneumatically conveyed separately and mixed at the nozzle. Phoscrete SG has enhanced shooting characteristics, providing reduced setting times, very rapid hardening and early strength gain, as it is typical of MALP product technology.

PROVEN APPLICATIONS

- › Rehabilitation of concrete bridges
- › Rehabilitation of tunnels, marine structures, reservoirs, and dams
- › Rapid repair of spillway walls, concrete silos, and ramps
- › Emergency concrete repairs in civil applications
- › New construction including, shells, domes, tunnel linings and stabilization

ADVANTAGES

- › Reduced construction schedule and early re-opening times
- › Very high early strength - 5,000 psi compressive strength and 1,500 psi bond strength 1 hour following placement at 73°F
- › Labor and time-saving - builds greater thicknesses in a single pass, no sandblasting of steel bars, no curing compounds
- › Easy to apply - high-build, non-sag, low rebound.
- › Easy to finish using screeds, floats, trowels or stucco sponge
- › Easy clean-up with water
- › Fiber reinforced: high flexural strength, ductility and durability
- › High adhesion to concrete surfaces - forms a both mechanical and chemical bond to cured concrete
- › No cold joints - bonds to itself, wet or cured
- › Virtually free of shrinkage cracks.
- › Stops rust - converts iron oxide to metal phosphate and inhibits corrosion
- › Freeze-thaw and salt scaling resistant, even when exposed to MgCl₂ and CaCl₂
- › Durable in marine environments - resists chloride penetration
- › Durable in contact with soil – resists to the attack of sulphates
- › Chemically stable - no added chlorides, no added sand or aggregates
- › Not a vapor barrier
- › Does not out-gas after cure - accepts sealers and coatings as soon as 15 minutes following initial set
- › 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 = 48 Bags + 1 Drum

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

Liquid Activator Drums:
450 lb. (204 kg) in HDPE drums

Fast-Set Admix:
0.5 lb. (0.227 kg) per dose

Mixing Ratio

Wet-To-Dry Ratio: 16%

Application Rate

1 cy per hour

Yield

22 ft³ (0.62 m³) less rebound
Do not extend with
aggregate.

Rebound

20% to 40%

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	ATM C266	Time of Setting by Gillmore Needles	Initial Final	18 min	28 min
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	Caltrans 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%
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	5000	34.5
			1 day	6500	44.8
			28 days	8000	55.2
Flexural Strength	ASTM C78	Flexural Strength of Concrete Using Simple Beam with Third-Point Loading	1 hour	400	2.76
			1 day	500	3.4
			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
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 [Chord Modulus] Poisson's Ratio of Concrete in Compression	7 days	2.82 E ⁺⁰⁶	1.9 E ⁺⁰⁴
				0.282	
Durability Properties					
Test	Specificati	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	98%	
Scaling	ASTM C672	Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals (25 cycles)		Visual	Loss
			NaCl	0	0
			CaCl ₂ & 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	
	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	Caltrans CT-550	Determining the Surface Abrasion Resistance of Concrete Specimens (mass loss)	24 hours	16 g	1.8%
Sulphate Resistance	ASTM C1012	Length Change of Cement Mortars Exposed to Sulphate Solution (mg/Kg) Contraction (-) Expansion (+)	28 days: -0.005%		
			91 days: -0.009%		
			182 days: -0.009%		
			365 days: -0.013%		

GENERAL INSTALLATION GUIDELINES

- › Refer to the latest and most complete documentation on best installation practices. [Phoscrete Full Installation Guide](#) is published on Phoscrete's website.
- › Contact Phoscrete technical support install@phoscrete.com or call +1-561-420-0595 with any questions regarding a specific application.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- › Certified Nozzleman strongly recommended
- › Full-Face Personal Respirator for nozzleman and finishers
- › Protective Clothing (Tyvek), gloves, disposable safety goggles (bring extras), and masks for gunman, mixer operators
- › First-Aid, Eye wash station, water and towels
- › Hearing protection

SURFACE PREPARATION

- › Concrete must be sound and fully cured.
- › Loose, damaged and contaminated concrete from oil, grease, and other bond-inhibiting materials must be removed.
- › Surface must be dry, free of standing water. SSD surface is not acceptable.
- › Remove loose rust and scale from steel bars using a wire brush. Sandblasting is not required.
- › Reinforcing steels should be completely exposed in order to maximize corrosion protection.
- › Concrete profile should reach minimum CSP of 7 per ICRI Guidelines.
- › Repair area should not be less than 1-inch deep.
- › No concrete primer is required

EQUIPMENT REQUIRED

- › Rotary Guniting Machine: Phoscrete tested and approved the Blastcrete Model AA 020 "Genuine Piccola" Rotary Guniting Machine with Hoses. Please check with technical support when using another dry shotcrete/guniting machine.
- › Phoscrete Gunning Set includes nozzle assembly and two [2] activator pumps. This nozzle assembly includes a specialized wetting ring required for Phoscrete Activator.
- › Pneumatic Air Compressor, minimum 750 CFM
- › All required hoses, couplings, cables, and connectors
- › Magnesium floats, steel trowels, urethane-coated screeds, stucco sponge
- › Buckets of water and rags to clean Phoscrete off tools when finishing, and in case nozzle gets clogged
- › Windscreens, plastic sheeting, and tarps protect from wind and rain, shield moving traffic from dust and flying rebound

TEMPERATURE CONSIDERATIONS

- › In warm (>70°F/20°C) and cold climates (<50°F/10°C), refer to Phoscrete's [All Temperature Guidelines](#) for usage of Phoscrete Fast- and Slow-Set Admixtures, and for best practices on cooling/supercooling Phoscrete Liquid Activator.

APPLICATION

- › Apply in compliance with ACI 506 "Guide to Shotcrete" publication
- › Ensure crew is familiar in advance with all equipment operation, troubleshooting, and cleanup
- › Ensure crew is familiar with Nozzleman's signals. If not in line of sight, use radios or assign a signal relay person.
- › Mix ratio is 16% Wet to Dry, adjusted by the nozzleman.
- › When gunning, direct the build-up of Phoscrete SG in a sensible sequence to ensure that corners are soundly filled, and all reinforcement is embedded without the formation of voids.
- › Apply the shotcrete to the required thickness, line and surface.
- › Finish using screeds, floats, trowels, and lightly dampened stucco sponge. Force material against any edges. When Phoscrete SG sticks to tools, clean with water and Do not introduce water directly onto concrete surface.
- › If rain occurs prior to initial set, cover the surface with plastic sheeting for at least 15 minutes following initial set.
- › No curing compound is required.

CLEANING

- › When the job is completed, clean tools with water.
- › Flush pumps and liquid line hose with water
- › Securely cap and secure Liquid Activator Drums
- › Ensure nozzle is immersed in water after use.
- › Clean thoroughly back at the shop prior to returning equipment to case.

LIMITATIONS

- › Minimum application thickness: 1-inch
- › Maximum application thickness: none
- › Do not apply Phoscrete SG as a thin veneer.
- › Minimum ambient temperature: -5°F
- › Do not use water when mixing and/or placing Phoscrete SG
- › Do not extend Phoscrete SG with aggregate.
- › Do not add sand and/or any type of cement.
- › Do not use water when finishing Phoscrete SG.
- › No direct contact with galvanized steel (zinc) 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.