

POLYMERIC SILICA-BASED REACTIVE HARDENER, DENSIFIER AND SEALER

DESCRIPTION

PENESEAL™ FH-PS is a clear, reactive penetrating sealer designed to permanently protect, preserve and strengthen concrete and masonry building materials. PENESEAL™ FH-PS was developed to absorb deep into the concrete capillaries where it reacts with hydration products transforming them into a harder, denser, stronger concrete mass. PENESEAL™ FH-PS is manufactured without metallic hydroxides which alleviates efflorescence and prevents reactive aggregate reactions such as ASR. PENESEAL™ FH-PS is formulated from nanosized ingredients that penetrate deep into concrete pores where it reacts with hydrated lime to form a stable and insoluble gel. Because it is nano-sized, PENESEAL™ FH-PS has a higher reactive surface area that begins to react immediately on contact making the concrete more resistant to water. The nano-sized particles are also more effective at filling in uneven surfaces making the concrete more resistant to abrasion, chemical attack, dusting, and bacterial growth. This results in a highly reflective concrete surface when polished.

RECOMMENDED FOR

- ▶ Exterior & interior slabs
- ▶ New & old concrete
- ▶ Food & drug processing plants
- ▶ Warehouses
- ▶ Manufacturing facilities

ADVANTAGES

- ▶ Curing: PENESEAL™ FH-PS allows concrete to cure uniformly through its chemical and moisture retention reaction. This aids in a more complete hydration process and reduces hairline and temperature cracking.
- ▶ Sealing: PENESEAL™ FH-PS penetrates deep into the concrete, which allows its chemical reaction to lock the pores from within, providing an integral and permanent seal.
- ▶ Hardening: PENESEAL™ FH-PS binds the elemental parts of the concrete, solidifying them into a denser, tougher, harder mass. This results in a more durable concrete with higher surface- abrasion resistance and compressive strength.
- ▶ Dustproofing: PENESEAL™ FH-PS densifies the surface of the concrete through its chemical bonding. This permanently seals the surface and eliminates surface dusting.
- ▶ Improved bonding: PENESEAL™ FH-PS eliminates the alkali salts and minerals that weaken and delaminate surface coatings. PENESEAL™ FH-PS leaves the concrete surface free of these salts and minerals, which improves bonding of any surface covering.
- ▶ Protection from efflorescence and leaching: PENESEAL™ FH-PS penetrates deeply into concrete, neutralizing the alkali salts and minerals that cause efflorescence and salt leaching.
- ▶ Fast drying: PENESEAL™ FH-PS is ready for polishing in 1-2 hours.
- ▶ Reduced maintenance cost: Nanotechnology ensures deep penetration and maximum reactivity with the concrete matrix, thus reducing maintenance cost.
- ▶ High sheen: PENESEAL™ FH-PS provides high sheen that improves over time to impart gloss with proper maintenance.
- ▶ Low VOC and odorless.

TECHNICAL DATA

Characteristic	Test Result	Test Method
Flash point	Does not flash	
Drying time	1-2 hours	
Curing	> 60 % moisture retention during initial 24 hours	
Permeability	Approximately 98 % reduction in permeability at 100 psi (7 bar)	
Weathering	No adverse effect on exposure to UV light	ASTM G 2381

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Mechanical properties after 7 days of full cure:

Results may vary depending upon concrete mix design and concrete porosity

Characteristic	Test Result	Test Method
Abrasion	Up to 81 % increase in abrasion resistance	ASTM C 779
Bonding	Up to 60 % increase in epoxy and polyurethane adhesion	ASTM D 3359
Hardening	Up to 40 % increase in compressive strength	ASTM C 39
Schmidt Hammer	Up to 16 % increase in impact resistance	ASTM C 805

Cooler temperatures, inadequate ventilation and higher humidity can extend drying times. All data derived from tests under laboratory conditions; field conditions may yield slightly different results. General soundness of the concrete substrate (porosity, strength, absorption, etc.), as well as ambient conditions, as already noted, may yield varying results.

DIRECTIONS FOR USE

Surface Preparation: Surfaces to be treated should have an open pored surface so that PENESEAL™ FH-PS can be absorbed. Remove all coatings, form oils, curing or sealing agents through chemical or mechanical means. Remove dust, dirt, laitance or any other contaminants by sweeping all areas to be treated with a fine bristle broom or scrub brush. Hose off with water and let dry. Remove any standing or puddled water to avoid dilution of PENESEAL™ FH-PS, before it is able to penetrate the surface.

Mixing: PRIOR TO USE, agitate bucket or drum.

Note: PENESEAL™ FH-PS is ready to use and not to be diluted with water.

Application: Spray or pour followed by brooming or squeegeeing to saturate the surface.

Tools: Low-pressure sprayer, soft-bristle broom, squeegee, and water hose.

Step 1: Apply PENESEAL™ FH-PS immediately, following the concrete finishing or as soon as the concrete surface is firm enough to walk on. Keep the entire surface wet with PENESEAL™ FH-PS for 30 minutes, working it into the surface with a soft-bristled broom.

Step 2: Lightly mist the surface with water to keep the material in solution, providing maximum penetration and to prevent surface drying. Do not allow PENESEAL™ FH-PS to dry on the surface.

Step 3: As PENESEAL™ FH-PS again becomes slippery underfoot, thoroughly flush with water and completely dry the entire surface to remove all surface alkali or PENESEAL™ FH-PS residue. Should ponding occur, blot ponded areas with exploded tip cotton mop. Avoid drying with a squeegee as this may damage the concrete finish. Do not allow PENESEAL™ FH-PS to dry on the surface.

For Old Concrete:

Step 1: Saturate the surface with PENESEAL™ FH-PS so that the entire surface remains wet for at least 15 minutes. Time may vary depending upon ambient weather condition.

Step 2: If after 15-20 minutes the majority of PENESEAL™ FH-PS has been absorbed into the surface, broom or squeegee any excess material from all low spots and puddles so that all remaining PENESEAL™ FH-PS is totally removed from the surface. Gently flush with water to solubilize excess. Porous surfaces may require an additional application of PENESEAL™ FH-PS to achieve maximum protection.

Step 3: If excess material does not penetrate within 15-20 minutes of application, mist surface with water and scrub off by using an automatic floor scrubber. Where a burnished or polished finish is required, refer to Technical Bulletin for guide recommendations.

General application Notes:

Application temperature limits: 4 °C to 38 °C (40 °F to 100 °F). The reaction of PENESEAL™ FH-PS will be slowed at low temperatures. In these cases, the concrete should be protected from freezing for six days.

Drying time: 1 to 2 hours, depending upon surrounding weather condition. The surface shall be ready for grinding and polishing immediately after drying.

Number of applications required: Typically, only one application is required. An additional application may be required on porous substrates to achieve maximum performance.

Time requirement for curing, sealing and hardening: PENESEAL™ FH-PS, being a highly reactive material, has the reaction time of 7-14 days. PENESEAL™ FH-PS imparts sealing qualities from within by locking the pores, thus strengthening and protecting the concrete throughout. This process is essentially complete within 56 days but may continue at a much slower rate up to a year.

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Color: Clear. PENESAL™ FH-PS will not change the natural appearance of the masonry or concrete. During application, all treated surfaces must be flushed clean with clean water to prevent impurities from drying on the surface.

Duration of effectiveness: PENESAL™ FH-PS is permanent. The concrete durability and appearance improve with age.

Painting or covering preparation: On old concrete, allow 3-7 days and on new concrete allow 30 days for proper curing before applying paint or coverings to PENESAL™ FH-PS treated surfaces.

CLEAN UP

Clean all equipment with water only. Do not use thinners.

MAINTENANCE

Floors: Wash or wet mop with neutral or high pH detergent. Detergents must not contain caustic soda, sulfates or hydroxides. Acids and acidic cleaners will dull the surface sheen and/or etch the surface.

Walls: Flush with clean water.

COVERAGE

Approximately 10-12 m²/L (400-500 ft²/gal). Coverage can vary, depending on the temperature and porosity of the concrete.

SPECIAL CONSIDERATIONS

Protect glazed and finished surfaces, such as glass and aluminum, from PENESAL™ FH-PS. In case of contact, flush immediately with water.

DO NOT apply PENESAL™ FH-PS to frozen or freezing surfaces or when temperature falls below 4 °C (40 °F) or if temperatures will drop below freezing during the curing period (approximately 24 hours).

Protect surfaces from equipment leaks or other leaks, such as oil, hydraulic fluid, etc.

PENESAL™ FH-PS treated surfaces can become slippery during application. Exercise caution and wear appropriate footwear and protective clothing.

PENESAL™ FH-PS is not a vapor barrier.

Contact PENETRON HELLAS S.A. for additional information, regarding your project.

JOB MOCKUPS

Penetron Specialty Products recommends that when our products are used in any application or as part of any system that includes other manufacturers' products, the installer and/or design professional shall test all the system components collectively for compatibility, performance and long-term intended use in accordance

with pertinent and accepted industry standards prior to any installation. Written documentation of the tests performed shall be satisfactory to the design professional and installer. Test results must include the means and methods of application, products used, project specific conditions being addressed, and standardized tests performed for each proposed system or variation.

PACKAGING

3,8 L (1 gal) jugs and 19 L (5 gal) pails.

STORAGE / SHELF LIFE

Storage life is 24 months from the date of manufacture, when unopened, undamaged original container is properly stored in a cool and dry place, unexposed to moisture and sunlight. Always tightly reseal container after use. DO NOT ALLOW TO FREEZE!

SAFE HANDLING INFORMATION

Before using this product, review the PENESAL™ FH-PS Safety Data Sheet (SDS). Avoid contact with eyes and wear suitable protective eyewear. Avoid prolonged or repeated contact with skin. Wear gloves and suitable protective clothing. Do not breathe dust. In case of insufficient ventilation, wear respiratory equipment. For additional information regarding first aid and emergency procedures, refer to the product Safety Data Sheet (SDS). Waste disposal: This product, when discarded or disposed of, is not listed as a hazardous waste in federal regulations. Dispose in a landfill in accordance with local regulations. For further information please refer to Safety Data Sheet. PENETRON HELLAS S.A. has recently updated Safety Data Sheet on the safe use of PENETRON® products. Each Safety Data Sheet contains health and safety information for the protection of your employees and your customers. KEEP OUT OF REACH OF CHILDREN.

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WARRANTY - DISCLAIMER

PENETRON HELLAS S.A. warrants that its products are manufactured under certified ISO Standard procedures, are of excellent quality and shall be free from material defects and contain all components in their proper proportion. Should any of the products be proven defective, the liability to PENETRON HELLAS S.A. shall be limited to replacement of the material proven to be defective, since the standard application procedures have been met and the suitability of the product for the particular application have been proven. PENETRON HELLAS S.A. makes no warranty as to merchantability of fitness for a particular purpose. User, after contacting the distributor of the product, shall determine the suitability of the product for his intended use and assume all risks and liability in connection therewith. While every care has been taken, the information provided in this product's data sheet make no part of any contract. All recommendations, technical data and test data contained in this product's data sheet are based upon the results of control laboratory tests or in actual field tests. However, PENETRON HELLAS S.A. accepts no liability for the results obtained. It is suggested that potential users try small applications to determine the suitability of each individual product for their specific requirements. The users should always refer to the most recent edition of the product's data sheet. PENETRON HELLAS S.A. may particularly differentiate its versions of the product's data sheet compared with those of PENETRON INTERNATIONAL LTD or respective PENETRON companies worldwide. These changes are due to text formatting, different application weathering and procedures or different product names and aim at the optimal consumer information.

CERTIFICATION



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PENESAL FH-PS

Products and systems for the protection and repair of
concrete structures - Protection against penetration Class 1.2
(I) and increasing of physical resistance Class 5.2 (I)

Capillary water absorption: <math>< 0.1 \text{ kg/m}^2\text{h}^{0.5}</math>

Abrasion resistance: NPD

Penetration depth: $\geq 5 \text{ mm}$

Impact strength: Class I ($\geq 4 \text{ Nm}$)

Bond strength by pull-off: $\geq 1.5 \text{ MPa}$

Reaction to fire: NPD

Dangerous substances: NPD