

CONSTRUCTION SPECIFICATIONS

Soy Methyl Ester Polystyrene (SME-PS) Specifications Concrete Pore Sealer to increase the Long-Term Durability of Concrete for New and Existing Concrete Surfaces

1. DESCRIPTION

This work consists of horizontal or vertical placement of Soy Methyl Ester Polystyrene (SME-PS) on new or existing concrete surfaces, as shown in the contract documents.

SME-PS is a high-performance, non-hazardous, concrete durability enhancer for all densities of concrete, new or old. It can be applied topically in place of common penetrating sealers; however, it performs very differently. SME-PS absorbs into concrete pores to block fluid penetration from inside the concrete structure. It is self-filling, self-sealing, and seals additional cracks as they form. It is a long-term (10+ years) durability enhancer which protects concrete from premature damage caused by moisture, salt, deicing chemicals, and freeze/thaw cycles. SME-PS creates a hydrophobic barrier that is both preventative and curative.

SME-PS can be applied to old and new concrete horizontal and vertical surfaces, above or below grade, on exterior and interior surfaces, on high-density or low-density concrete, on precast, prestressed, or cast-in-place concrete. SME-PS is a liquid that can be applied in a variety of ways: truck spray bar, controlled wheel line sprayer, backpack sprayer, paint roller, squeegee, or paint brush.

Product attributes are:

- Protects concrete from moisture penetration
- Blocks ion transfer into concrete: Ca, Cl, Mg, etc.
- Prevents CaOCl_2 (Calcium Oxychloride) formation
- Arrests ASR (alkali-silica reaction) deterioration
- Inhibits staining and rebar corrosion
- Inhibits spalling, scaling, efflorescence
- Extends service life of concrete

2. PRODUCTS

2.A. SME-PS Composition Properties

Table 2A Composition Properties of SME-PS	
Property	Value
Active Ingredients by Mass of Total Solids	
Soy Methyl Ester (%)	95 – 98
Polystyrene (%)	2 - 5
Viscosity @ 23°C per ASTM D-445 (cP)	7.0 - 10.0
Specific Gravity (g/cc)	0.86 - 0.90
Gardner Color (scale)	1 – 3

2.B. SME-PS Performance Properties

Table 2B Performance Properties of SME-PS when applied to PCC Concrete		
Requirement	Test Method	Performance
Freeze/Thaw Durability (Relative Dynamic Modulus)	ASTM C 666	94% after 300 cycles (Failure threshold 60%)
Salt Scaling Resistance (VRI, mass loss)	ASTM C 672	VRI: 0 after 50 cycles Mass loss: 0.01 lb./sq. ft.
Water Absorption (%)	ASTM C 1585	70% reduction in water absorption
Chloride Ion Diffusion (% Reduction vs. untreated)	AASHTO T 259	35% Cl - reduction @ 0.0625-0.5" below surface 60% Cl-reduction @ 0.5-1.0" below surface

SAFETY INFORMATION

- Low VOC (Volatile Organic Compounds),
- Requires no PPE (Personal Protective Equipment).
- No concern for overspray into waterways, or land.

2.C. Product Data

Provide certifications stating the conformity of the material with local, state, federal, environmental and worker safety laws and regulations, as requested.

Confirm compliance with Properties in Table 2A.

Provide Installation Guide for SME-PS: including storage, handling, surface preparation, mixing, placing, and finishing guidelines.

Use manufactures Technical Data Sheet (TDS) to determine coverage requirements based on the porosity of the concrete and joint treatment installation requirements.

3. EQUIPMENT AND TOOLS

Use tools as recommended by the manufacturer for proper application of SME-PS.

Clean tools with soap and water. Be sure to wipe off excess water between applications to prevent introduction of water during next application of SME-PS.

4. APPLICATION METHOD

Provide a technical representative from the Supplier of SME-PS at the start of work for a minimum of one full working day. Alternatively, provide a written statement by the Supplier assuring that the Contractor is qualified to apply SME-PS.

The written statement must be dated within the last twelve (12) months. It must include the names of key personnel who will perform and supervise the actual application of SME-PS. The Engineer may suspend work if unauthorized personnel are substituted for authorized personnel during construction.

4.A. Delivery, Storage and Disposal

Deliver the product in original, unopened, undamaged, factory-sealed packaging.

Verify Manufacturer's labels are intact and legible. Labels must include brand, product name, weight, system identification number, and batch number, with verification of date of manufacture and shelf life.

Store product in a clean location, out of direct sunlight. Maintain storage temperature required by the Manufacturer. Avoid contact with moisture.

Do not use products that have exceeded their shelf life.

Dispose of expired product in accordance with Manufacturer's recommendations and local environmental regulations.

4.B. Installation

4.B.1. Surface Preparation

Prepare concrete surfaces in accordance with the manufacturer’s specifications.

Ensure the area of application is dry and free of debris. Remove existing stains on concrete prior to application. For new or existing pavement joints, remove existing joint fillers and debris buildup.

4.B.2. Application

Apply SME-PS in accordance with the manufacturer’s installation guide.

Do not allow traffic on riding surfaces after placement until SME-PS is fully absorbed, the concrete surface is dry and not slick or tacky to the touch.

5. METHOD OF MEASUREMENT

Measure the area covered on concrete surfaces by SME-PS in square feet.

Measure the length of SME-PS coverage along joints in linear feet.

6. BASIS OF PAYMENT

The Department will pay for each pay item at the contract unit price per the specified pay unit as follows:

<i>SME-PS on Concrete Surfaces</i>	<i>Square Foot</i>
<i>SME-PS along Joint Headers</i>	<i>Linear Foot</i>

The Owner will consider the cost of all materials, equipment, labor, and incidentals necessary for the delivery, storage, handling, surface preparation, installation, sampling, and testing of SME-PS to be included in the unit price bid.