



PORESHIELD SME-PS FOR PCCP JOINTS

Revolutionary protection against premature
damage and deterioration

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Details	
Location:	United States
Date:	2019 - present
Application Type:	PCCP Joint



Overview

Concrete highways are a critical piece of infrastructure in the United States, essential for the reliable transportation of people and products. Yet in many cases, their service life is restricted by the limited durability of saw-cut Portland cement concrete pavement (PCCP) joints.

Repair and replacement of PCCP joints is a disruptive, expensive, and time-consuming process. Traditional damage and deterioration prevention strategies utilize either joint fill materials to keep fluid from entering the PCCP joints or coating products to create a barrier on the joint faces. Unfortunately, these solutions only offer 2-5 years of protection.

PoreShield (SME-PS) concrete durability enhancer is a new and innovative alternative to these short-term joint treatment solutions. Applied topically, PoreShield absorbs deep into the saw-cut and creates a fluid, hydrophobic barrier inside the pore network of concrete surrounding PCCP joints. Once absorbed into the concrete pores, PoreShield blocks fluid and ion ingress and provides long-lasting (10+ years) concrete protection with a single application. Since it does not set or cure, PoreShield continuously self-seals, adjusting to new damage as it occurs and providing enhanced concrete durability for many years.

Proven Performance

In many climates throughout the United States, concrete highways are vulnerable to deterioration mechanisms that result from winter and the corresponding deicing treatments (i.e. NaCl, CaCl₂, and MgCl₂) meant to keep roads in a safe, working condition through snow and ice events. These deterioration mechanisms include expansive pressure caused by freeze/thaw cycles as well as salt crystallization damage and chemical deterioration mechanisms, such as calcium oxychloride formation.

More than a decade of research and testing demonstrates that PoreShield offers superior protection against these hazards. In fact, [a recent study out of Drexel University](#) demonstrated that PoreShield reduces calcium oxychloride formation by more than 90% (He et al., 2022).

In addition, an [independent study](#) sponsored by the Wisconsin Department of Transportation concluded that

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PoreShield reduced chloride ion diffusion by twice as much as other leading products, preventing both short- and long-term damage to concrete (Xaio et al., 2020). The study also determined that PoreShield SME-PS extends the service life of PCCP joints 5.4 to 9 times longer, compared to untreated concrete.

Safe and Easy to Apply

PoreShield SME-PS is safe and easy to apply. It can be sprayed into PCCP joints using traditional equipment without any modifications. PoreShield is safe to handle and store. It is also a low VOC product (43.3 g/L) and requires no PPE for application. It is also a USDA BioPreferred product.

To date, applicators have been thoroughly impressed with the ease and safety of PoreShield SME-PS applications.

Joe Thomas, vice president of operations at Primco, Inc. applied PoreShield to saw cut joints on the free-flow ramp interchange of [US 24 and I-469 near Fort Wayne, Indiana](#) in late 2019.

“PoreShield helps us in our day-to-day job because it’s quick and easy to use,” he said. “We don’t have the cleanup that we would have had with a silicone-based material.”

In 2020, Tony Korba, concrete operations manager at E&B Paving, applied PoreShield to 14 miles of PCCP joints on [I-65 near Seymour, Indiana](#). He used a recreational vehicle with a tank, a pump and two hoses to allow two workers to apply PoreShield at the same time.

“It was basically as fast as you could walk,” said Korba. “The speed of the application was just unbelievable compared to a sealant.”

Growing Adoption

Following the application to I-65, the Indiana Department of Transportation published a unique special provision specifying “soy-based penetrating sealers for PCC joints.” Now, INDOT is writing these PoreShield SME-PS-based products into a Design Manual Spec, which specifies them for use as a general part of PCCP design.

PoreShield SME-PS is also being specified by the city of Sioux Falls, South Dakota as a standard practice on new paving bids following a successful application in 2021.

In addition to Indiana and South Dakota, the number of applications of PoreShield SME-PS to PCCP joints is growing. More DOTs across the United States are expected to follow suit as they learn about and trial PoreShield SME-PS.



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