

SAVE MY ROAD

Problem: Rapid discoloration of chip seals

Solution: High-performance fog seal

Success Story: High-Performance Fog Seal

The finished appearance of pavement as seen with hot mix asphalt (HMA) has become associated with a well-maintained road. While chip sealed roads perform to similarly high standards as HMA roads, they often generate a perception of being old and deteriorating due to their lightened color, leaving agencies appearing negligent in their efforts. The practice of fog sealing a chip seal has aided in the aesthetic battle and in extending the life of chip sealed roads. However, the dark surface coloring created by the fog seal typically fades with traffic after a few months. To satisfy public perception and extend the life of chip seals, a longer lasting, high-performance fog seal containing polymer modification is needed.

Ergon Asphalt & Emulsions' (Ergon A&E) eFog, a rejuvenating fog seal used to restore essential elements in worn, oxidized pavement, and CSS-1H, a cationic slow-setting asphalt emulsion, were two successful fog seals already on the market. While eFog contains the added polymer to meet the classification of high performance, the fog seal contains a rejuvenator used to soften brittle pavement. With a new road surface, the rejuvenator would turn fresh chip seals to mush. At the same time, CSS-1H was absent of polymer and did not meet high-performance specifications.

To combat this challenge while ensuring a long-lasting dark surface, Ergon A&E and Paragon Technical Services set out to develop a new high-performance polymer modified fog seal that would (1) serve as a durable protective layer to the surface, (2) enhance adhesion to mitigate loose aggregate, (3) set up quickly, and (4) resist discoloration for at least a year. Following extensive configuration and in-lab testing, a Cationic High-Performance Fog Seal (CHPF-1) was ready for real-world application.

The first test trial with the Tennessee Department of Transportation (TDOT) was over a chip sealed road in Decatur County, Tennessee. The CHPF-1 performed well at increasing loose aggregate retention and was able to set up quickly. However, after six months' exposure to weather, discoloration was observed. With the goal of resisting discoloration for one year unmet, further color stability improvements were needed.

A new formulation with an added high-performance blackening agent was tested on a fog seal project in Cullman County, Alabama. An Etnyre distributor was used to apply the fog seal over an oxidized hot mix surface at an average shot rate of 0.10 gallons per square yard. After 45 minutes to allow the fog seal to properly set, the road was reopened to traffic.

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CHPF-1 met the baseline goal of one year with minimal discoloration and, at an average cost of \$0.25-\$0.50 per square yard, has proven to be a very cost-effective treatment to achieve an aesthetically pleasing dark surface.