



Functional Differences Between Asphalt Rejuvenator Emulsions and Asphalt Seal Coat Emulsions in Protecting Pavement Surfaces.

Asphalt rejuvenators and asphalt seal coat formulations have emerged regionally over the last 20 or more years as pavement maintenance applications to combat environmental factors causing deterioration of asphalt pavements. Use of asphalt rejuvenators is more common in western regions of the country, while asphalt seal coat is more often used in regions of the Midwest, Northeast and South.

Both technologies have evolved by design to arrest the identifiable mechanisms of pavement distress associated with beginning stages of pavement failure. However, the major environmental causes of pavement weathering in Phoenix or Denver may not be the same as those in Detroit or Boston.

In hot dry climates of the West, the primary mechanism of pavement deterioration is oxidation and embrittlement of asphalt binder at the pavement surface from prolonged exposure to sun and high temperatures. Loss of fine aggregates from the surface of the asphalt pavement matrix is often attributed as the major cause leading to raveling of larger aggregate and ultimate pavement failure. Rejuvenators are generally asphalt emulsions containing lighter asphalt fractions to re-soften oxidized asphalt binder at the pavement surface, which assists the binder in retaining encapsulated aggregate fines, and minimizing aggregate loss by traffic wear.

In northern climate regions of the country, asphalt binder oxidation is a minor contributing factor of pavement deterioration. The major destructive factors of pavements in these regions of the country are water penetration and stresses induced by repeated freeze/thaw cycles, leading to pavement cracking, further water intrusion and subsequent erosion of the pavement sub-base. Seal coat mix formulations are designed to provide a sealing membrane to protect the pavement surface from water penetration, and better address the environmental factors to preserve pavement surfaces encountered in the Midwest and Northeast. Seal coat formulations usually containing sand are widely used in parking lot maintenance programs and found to be effective in prolonging pavement assets in these areas, where use of rejuvenator formulations is comparatively rare. Both asphalt based rejuvenators and pavement seal coat formulations can be effective, but were each designed to address different climatic factors unique to regional climates, and not suited to one-size-fits-all remedies.

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