NCDOT Pavement Preservation Bulletin
Materials and Tests Unit

Mat Seals

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Resources

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Mat Seal Specifications: Section 660-8 (B), (C), (D)

Division 9 Mat Seal Contract: DI00244

FP² Interlayers Website

*Section 660 has been updated in the 2024 Standard Specifications Book

What is a Mat Seal?

A Mat Seal is a type of Chip Seal that uses larger aggregate than typically used in a standard Chip Seal. Mat Seal Aggregate is typically 57, 57M, 67, or 78M. Emulsion for Mat Seal should be the same as used in Chip Seal: CRS-2L in North Carolina.

Cost and Life Extension

Estimated Unit Cost:

A Mat Seal layer can cost $1.00-$3.00 per square yard depending rates, contract size, etc.

Estimated Life Extension:

Life extension can vary from 1-4 years depending on existing pavement conditions and the layers applied over Mat Seal.

Pictured Above: Mat Seal (HMA Interlayer)

This Mat Seal of 67s was followed by a layer of HMA. Paved in 2021 in Anson County (Division 10).

Mat Seal as HMA Interlay

Mat Seals can be utilized as an interlayer beneath Hot Mixed Asphalt. The coarse aggregate and emulsion of the Mat Seal helps bridge the cracks in the underlying pavement, delaying the reflection of the cracks to the surface. Per Article 660-8(D) of the Standard Specifications, plant mix thickness on overlays shall be at least 1.5" and the Mat Seal must be covered by HMA the same day.

+/- of Mat Seals

Pros:

- Retards reflective cracking
- Extends pavement life
- Provides additional water penetration protection

Cons:

- More expensive than a standard chip seal
- Larger aggregate could produce a rougher ride
- Does not address rutting, bleeding, or structural distresses

Quarter 3, 2023

Mat Seal Construction Tips

Construction of Mat Seals will vary if applied on Soil Subgrade, in conjunction with a Chip Seal, or as an HMA Interlayer.

A clean substrate is necessary for Mat Seal to bond properly.

Sufficient emulsion should be seen through the Mat Seal to enhance bonding for next layer.

Pictured Above: Core of Mat Seal w/ Double Seal

This Mat Seal of 67s was followed by a layer of 78Ms and a layer of 14s. Lastly, the road was Fog Sealed, giving it the dark appearance. Paved in 2022 in Rowan County (Division 9).

Mat Seal Candidate Routes

- Low to Moderate Age/Block Cracking
- Non-Load associated cracking
- Preservation routes that have seen increased traffic volumes
- Routes that may not be revisited in 10+ years

Pictured Above: Mat Seal Treatment

This was a Mat Seal with 57 stone paved in 2023 in Division 11. This was performed as a Mat layer for a double chip seal.

Application Rates

Application rates vary widely from division to division and from aggregate size to aggregate size.

Rates of aggregate and emulsion are higher for a Mat Seal when it is used as the bottom layer of a Chip Seal than they are for an HMA interlayer. In a Chip Seal, the Mat Seal must have adequate rock coverage to prevent bleeding in the subsequent chip seal layers.

Rates of aggregate and emulsion of Mat Seals as an Interlayer for HMA are typically lighter. Proper calibration is vital. Emulsion should shine through the rock to assist in bonding of the succeeding layer.

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