

FLEXIBLE PAVEMENT CRACK TREATMENTS GUIDANCE

Method: Crack Clean and Fill vs Crack Rout and Seal – Which do you do?

Crack Clean and Fill – typically performed on older pavements having cracks $> \frac{3}{8}$ " to 1 inch in width. Crack is cleaned with compressed air and filled with sealant.

Crack Route and Seal – is performed on newer pavements having cracks $\leq \frac{3}{4}$ inch to 1 inch in width. This process involves routing a reservoir typically $\frac{3}{4}$ inch wide and $\frac{3}{4}$ inch deep. Sealant is placed in the crack with an overband to better seal the crack and help keep the sealant in place. The overband should be less than 3 inches wide and no more than $\frac{1}{8}$ " thick (high).

Quantity calculation: A field review is required to get a handle on lineal footage of cracking. One way is to look at past contracts to see yield rates of pounds of crack filling material used and lineal feet of cracks filled. It is possible to use the video logs gathered by the Pavement Management unit to review the pavements for cracking. That would be preferred to actual driving the roads, especially if the roads are higher volume or covered with snow. If assistance is needed to access the video logs, contact the Pavement Management office.

A common method in calculating crack volume is to determine crack density. This works for both parking lots and roadways. To calculate crack density for a parking lot, look at a 10-foot by 10-foot area that best represents the average condition of the pavement. Measure the linear feet of cracks within the 100 square foot area. Dividing the measured length of cracks by 100 provides the crack density. This could be further enhanced by looking at a few areas and taking average of them. For a pavement, look at 100 feet (one road station) of a 12-foot-wide driving lane. Measure the linear feet of cracks and divide by 1,200 to obtain the crack density.

Materials: MnDOT has three material specifications for types of hot poured sealers used in crack and joint treatments. These are as follows:

- Specification 3719 – Hot Poured, Crumb-Rubber
- Specification 3723 – Hot Poured Elastic
- Specification 3725 – Hot Poured, Extra Low Modulus, Elastic

Specification 3719 - Hot poured crumb rubber sealer is a low elastic, highly sticky sealer best suited for older pavements with wide cracks ($\geq 1\frac{1}{2}$ inches). Because it has low elasticity it works best in non-working transverse and longitudinal pavement cracks.

Specification 3723 - Hot poured elastic sealer is an elastic material well suited for sealing older pavements with medium cracks of $\frac{3}{4}$ inch to $1\frac{1}{2}$ inches wide. It is more flexible than crumb rubber (3719), performing better in sealing working transverse pavement cracks.

Specification 3725 - Hot poured extra low modulus elastic sealer is used on newer pavements with cracks $\leq \frac{3}{4}$ inch to 1 inch which are typically route and sealed. The low modulus more elastic characteristic of this sealer makes it a well performing material for narrower transverse working cracks in pavements.

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- Method of payment:** MnDOT pay items for crack treatments is by Road Station, Lineal Foot or Pound. Payment by Road Station works well when contracting for single or multiple roadways having similar cracking intervals or crack density. However, this is rarely the case. Pavement cracking can vary significantly on a single roadway and especially when combining multiple roadways in a single crack treatment contract. If payment by Lineal Foot is desired, it can be challenging to document work completed and keep up inspection of work being performed. Therefore, for most cases it is recommended to pay for this work by the Pound understanding the contract may under or over run depending on material required to complete the road segment. Payment by the Pound is a more finite number for a contractor to bid.
- MnDOT Specification:** SP2020-128, [S-154 \(2331\) Bituminous Pavement Crack Treatment](#)
Crack and Joint Sealers: [MnDOT Approved/Quality Products](#)
- Further Guidance:** **A clean and dry crack is key for good performance.** These conditions are needed for good adherence of the crack sealing material to the sidewalls of the crack. If there is water in the crack, delay sealing until excess moisture is gone. Crack treatments perform best when these conditions are met.
- When crack filling or sealing in cooler temperatures (< 50°F), a heat lance is recommended to dry and heat cracks before filling. Most suppliers require an application temperature of ≥ 40°F for applying their materials. Care must be exercised when using the heat lance to prevent scorching or burning the pavement.
- Shoulders should be treated.** That said, shoulder pavements are often older than mainline. In the case when the shoulder pavement is older and level of cracking high making it cost prohibitive to treat, other treatments such as scrub seal, overlay or rehabilitation should be programmed.
- Training:** AASHTO TC3 – [Crack Sealing and Filling](#)
[FHWA – Crack Seal Overview, Project Selection & Design](#)
[FHWA – Crack Sealing \(Series II\) Equipment and Proper Installation](#)
NHI 131110 Asphalt Pavement Preservation Treatment Series
- Resources:** [MnDOT Maintenance Manual](#), Chapter 3 Smooth Roads
[MnDOT Approved/Quality Products](#) – Crack and Joint Sealers
[MnDOT Pavement Preservation Manual](#), Chapter 4 Bituminous Pavement Treatment and Field Process Guidance
[Crack Treatment Checklist](#) – FHWA
[Pavement Distresses](#) – Pavement Interactive
[Life-Extending Benefit of Crack Sealing for Pavement Preservation \(Jan. 2020\)](#) – Transportation Research Record: Journal of the Transportation Research Board
[NCHRP Report 784](#) – Best Practices for Crack Treatments for Asphalt Pavements