

Sealant Troubleshooting

CAPTG Workshop

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Why Crack Treatment?

“Cracks are inevitable, and neglect leads to accelerated cracking and potholing, further reducing pavement serviceability” (FHWA-RD-99-147)

Why Crack Treatment?

“With proper and timely application, crack sealing and filling can extend pavement life past the point where the cost-benefit of added pavement life exceeds the cost of conducting the operation” (FHWA-RD-99-147)

Why Crack Treatment?

To prevent this...



Pavement Evaluation and Treatment Selection

- Identify various pavement (cracking) conditions
- Identify types of cracks i.e. thermal (transverse), longitudinal, block and fatigue (alligator)
- Identify “working” (high movement) and “non-working” (low or no movement) cracks
- Identify two treatments: crack sealing and performance crack filling

“Working” vs. “non-working” cracks:

“Working” (high movement)- $\geq 3\text{mm}$ movement

- Thermal

“Non-working” (low or no movement)- $\leq 3\text{mm}$ movement

- Longitudinal
 - Block
 - Fatigue

Sealant Troubleshooting

Common Issues

- Sealant Pulling out of Crack/Adhesion Loss
- Sealant Tracking
- Sealant Cracking
- Sealant Bubbling
- Bumps in New Overlay
- Slow Heat Up of Sealant
- Sealant too Thick
- Sealant Jelling in Melter/Applicator



Sealant Pulling out of Crack

1. Dirty / Wet Pavement at Application
2. Ambient Temperature too Cold at Application
3. Weak / Deteriorated Pavement
4. Oil or Moisture Introduced to Crack by Compressor / Pavement Contamination
5. Cracks Previously Sealed and not Clean Sufficiently Prior to Application
6. Incorrect Application
7. Sealant Over Heated / Under Heated
8. Sealant is Contaminated
9. Off-Spec Sealant

1,2&4 Dirty/Wet, Too cold to apply
& Oil or moisture from the
compressor



3 Weak Pavement





5 & 8 Previously sealed and not clean, contaminated / incompatible



6 Incorrect Application



7 Overheated/Under heated



Sealant Tracking

- Excessive Application
- Traffic Opened too Soon
- Ambient Temperature Higher than Normal
- Incorrect Sealant for Condition
- Sealant Over Heated / Under Heated
- Sealant is contaminated

1 3mm Max



Excessive Application



2 Blotting materials or Detack agents



Sealant Cracking

- Inappropriate Sealant for Ambient Conditions
- Excessive Movement at Crack
- Inappropriate Sealant Geometry (D:W)
- Improperly Applied Sealant
- In PCC Joints – Backer Rod Not Used
- Sealant Old Exceeding its Service Life

Sealant Geometry



Inappropriate
sealant for ambient
conditions



Excessive Movement



Sealant exceeding the service life



Inappropriate sealant for ambient conditions



Improperly
applied sealant









Sealant Bubbling

1. Moisture Present in Pavement
2. Wrong Backer Rod
3. Contaminated Sealant
4. Leaking Material Pump Packing

Surface Moisture



Hydration





Number 1 culprit “Moisture”



Bumps in New Overlay

- **Overlay Construction Related:**

- Use of rollers with power driven front drums.
- Use of 2 course paving with a thin leveling course.
- Use of stiffer tack coats.
- Waiting one or more years after sealing before overlaying.
- Modifying rolling patterns and temperatures based on operator experience to reduce mix shoving and mix designs.
- Slowing roller speed during compaction, especially for intermediate and final rolling
- Rolling to achieve compaction with the minimum number of passes. Do not "over roll"

- **Crack Sealant Related:**

- Install sealant in routed cracks leaving approximately 3/8 inch (1 cm) low in the crack with no sealant in the surface. (When sealing just prior to the overlay)
- Apply an isolation or non-stick layer or material over the sealant to prevent adherence. (i.e. lime, sand or other coating)
- Remove excess sealant and/or avoid excessive sealant applications.

Slow Heat Up of Sealant

- Inaccurate Temperature Gauges
- High Viscosity Sealant
- Old/Low Heat Transfer Oil
- Coking of Heat Transfer Oil reservoir
- Inadequate Melter/Applicator

Check and Calibrate Your Gauges



Check Your Heat Transfer Oil



Sealant too Thick

- Sealant Under Heated
- Inexperience with High Rubber % Sealants
- Old Sealant - Nearing Pot Life Limit

APPLICATION LIFE

APPLICATION LIFE: Application life when heated to application temperature is approximately 12 to 15 hours and may be extended by adding fresh product as quantity in the melter decreases. Product shall be agitated during installation.

Sealant Jelling in Melter/Applicator

- Sealant was Overheated
- Sealant Exceeded it's Pot life (heated too Long)

APPLICATION LIFE

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BOTTOM LINE



