# Paving Over Crack Filling & Everything You Need to Know About Tack Coats

Ohio Asphalt Paving Conference
Fawcett Center
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# Paving Over Crack Filling



Sealants Reflecting through Overlays

- Not a new phenomenon
- Widespread Awareness in the 70's
  - Polymer Modified Mixes
  - Pavement Preservation Efforts
- Not all Overlays
  - Generally Rare
  - Several Compounding Issues

# Paving Over Crack Filling

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**Pavement Preservation Efforts**

## Hot-Applied Rubberized Asphalt Sealant

- Most Commonly Used
- Cost-Effective
- When Life Cycle Cost Is Considered (Per SHRP H106)

# Paving Over Crack Filling



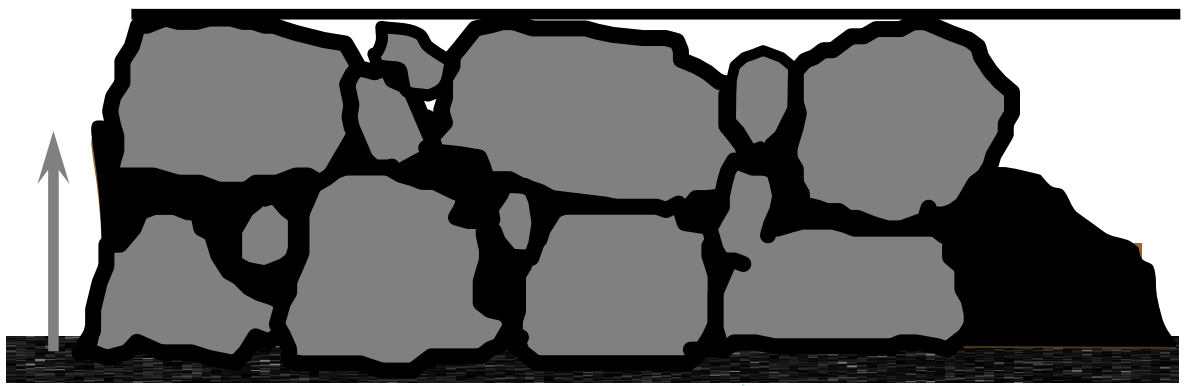
## Sealer Reacts to HMA Overlay

- Softens/Expands
  - Softening Point 175 – 225$^{o}$ F
- Wick up into HMA
  - Trapped moisture
- Causing Bumps
- Weak spots

# Paving Over Crack Filling



## Crack Filler “wicks up” into the HMA



# Paving Over Crack Filling



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## Compounding Issues

- HMA Mix Type
- Roller Types
- Compaction Procedures
- Crack Sealant Type
- Application Procedures
- Age of Sealant

## Compounding Issues

- HMA Mix Type
  - High Temperature Modified mixes
  - Thick Lifts vs. Thin Lifts
  - Harsh, hard to Compact

## Compounding Issues

- Roller Types
  - Heavy Rollers
  - Static vs. Vibratory
  - Pneumatic Rollers vs. Steel Wheel

# Paving Over Crack Filling



## Compounding Issues

- Compaction Procedures
  - Excessive Number of passes
  - Static vs. Vibratory

## Compounding Issues

- Sealant Type
  - Higher Softening Temperature
    - Cost vs. Benefit
      - Wait more than One year
      - Less than One Year

# Paving Over Crack Filling



## Compounding Issues

- Age of Sealant
  - Age hardened
    - Older than One year
    - Less than One Year
      - Route or Mill to Remove.

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## Rotary Impact Router

## Vertical Spindle Router

## Random Crack Saw

# Paving Over Crack Filling



## Milling to Remove Sealant

## Compounding Issues

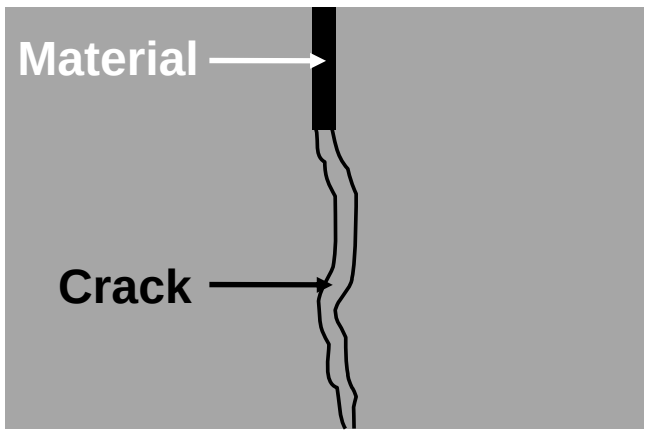
- Sealant Application Procedures
  - Amount
  - Configuration.

# Paving Over Crack Filling

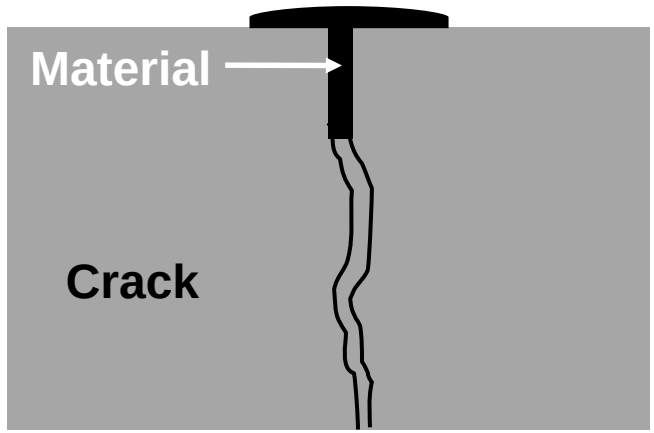


## Placement Configurations

**Flush Fill**




**Capped**



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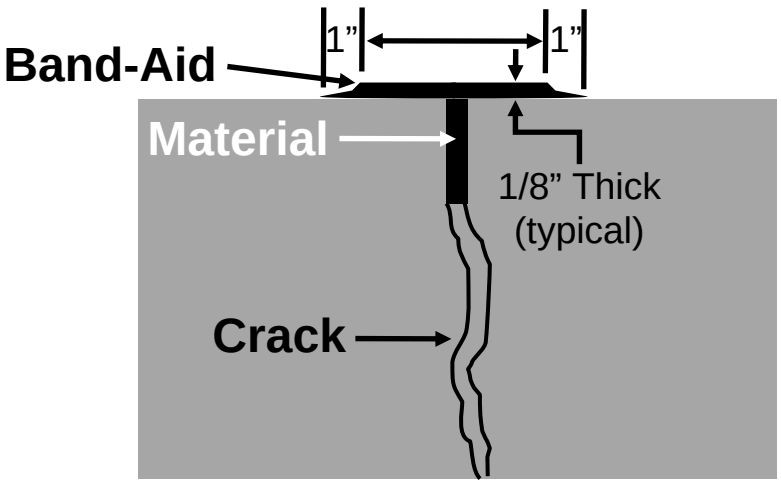
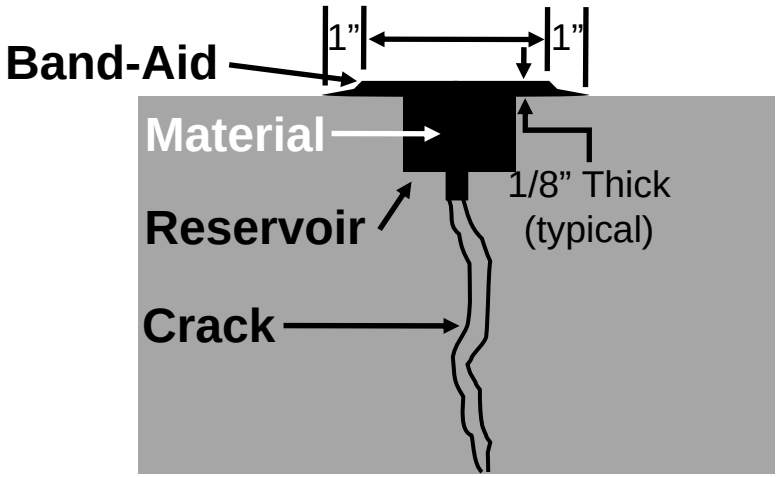
## Placement Configurations

### Simple Band-Aid




### Band-Aid with a Reservoir

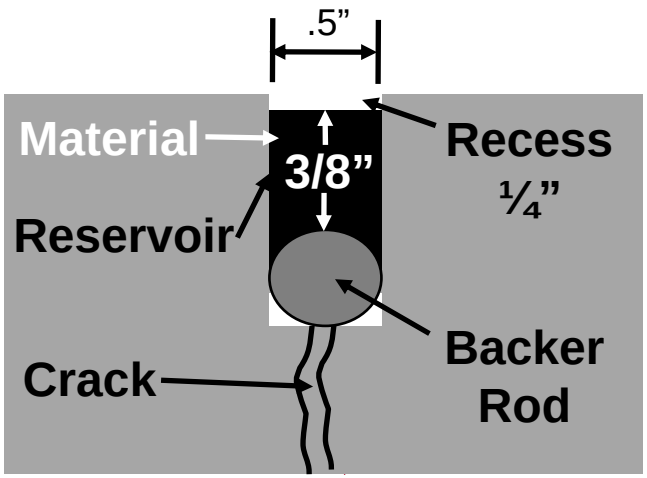


# Paving Over Crack Filling

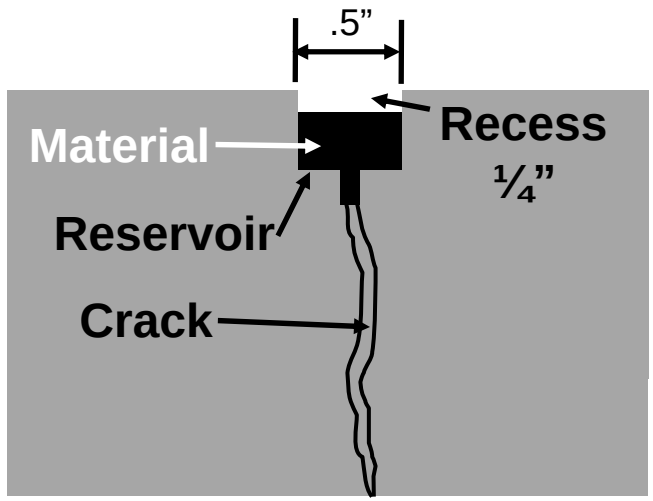


## Recommended Placement Configurations

### Deep Reservoir-and-Recess




### Standard Reservoir & Recess



## Evaluating the Potential

- Sources of Additional Information
  - Pavement Management System
  - Maintenance Records
  - Test Strips

# Paving Over Crack Filling



New Technology

Warm-Mix Asphalt

# Tack Coats

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# Tack Coats



Key component of a quality HMA paving

- Bonds to underlying layers
- Achieves maximum pavement strength
- It prevents delamination
- Ensures long-term performance

# Tack Coats



**Equipment**

- Well Maintained
- Functioning Properly
- Capable of maintaining Temperature & Pressure
  - Slow setting asphalt emulsions SS-1h
  - Spraying temperature between 75° F and 130° F

# Tack Coats

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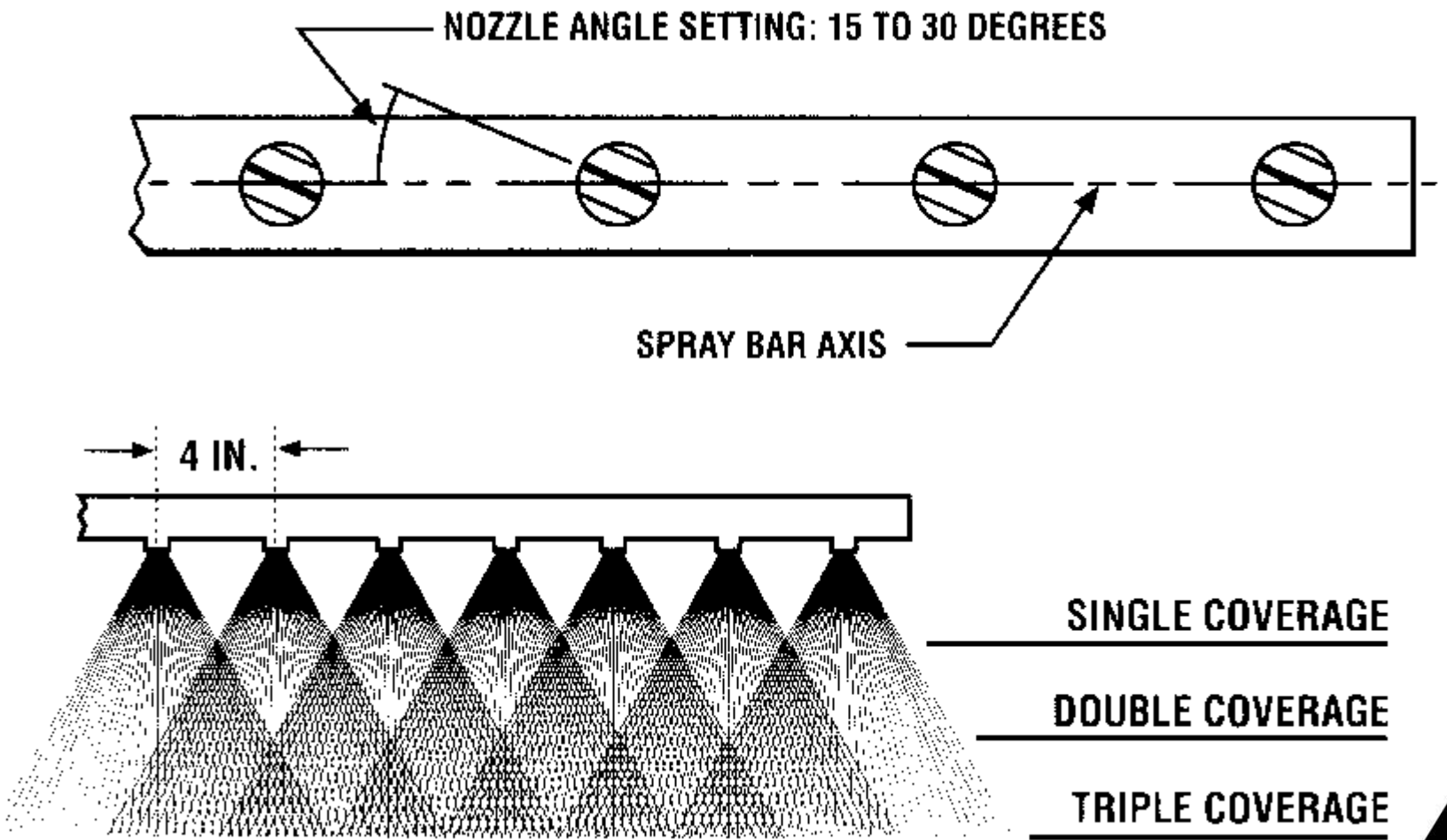
# Tack Coats




NOZZLE ANGLE SETTING: 15 TO 30 DEGREES
SPRAY BAR AXIS
4 IN.
SINGLE COVERAGE
DOUBLE COVERAGE
TRIPLE COVERAGE

# Tack Coats



## Pressure Distributor

# Tack Coats

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## Calibrate Distributor

# Tack Coats



- Slow setting emulsion are more stable
- Can be diluted in the field
  - Carefully, by adding water to the emulsion
  - Adding the emulsion to water may cause the tack to break.
- The dilution rate should be 1:1
- Dilution Allows Distributor
  - To Shoot at a Higher Spread
  - Higher Pressure
  - With Better Control
  - 90% Uniform Coverage of the Surface

# Heavy Tack Coat



# Tack Coats

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| Typical Application Rates | Rate * | | |
|---|---|---|---|
| | (gallons/sy) | | |
| | | | |
| **Existing Pavt Condition** | **Residual** | **Undiluted** | **Diluted(1:1)** |
| | **.03** | **.05** | **.10** |
| New Asphalt | **to** | **to** | **to** |
| | **.04** | **.07** | **.13** |

# Tack Coats

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| Typical Application Rates | Rate * | | |
|---|---|---|---|
| | (gallons/sy) | | |
| | | | |
| **Existing Pavt Condition** | **Residual** | **Undiluted** | **Diluted(1:1)** |
| | **.04** | **.07** | **.13** |
| Oxidized Asphalt | **to** | **to** | **to** |
| | **.06** | **.10** | **.20** |

# Tack Coats



Traffic should be kept off the tacked surface

- Good practice
  - Tack just far enough ahead
  - Sufficient time for the tack coat material to set
  - If the road surface must be open to traffic
    - Use clean dry sand cover
      - Provides friction
      - Prevents pick-up
      - Typical rate is 4 to 8 lbs/sy.
  - If the Surface gets dirty – Re-Tack
  - When in doubt – Re-Tack.

# Questions?

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&
Everything You Need to Know
About Tack Coats

**FPO Technical Bulletins**
www.flexiblepavements.org

**Asphalt Institute MS-19**
**www.asphaltinstitute.org**

# Thank You!

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