Pavement Preservation
Checklist Series

1 Crack Seal Application

FP2

U.S. Department of Transportation
Federal Highway Administration

Crack Seal Application Checklist

This checklist is one of a series created to guide State and local highway maintenance and inspection staff in the use of innovative pavement preventive maintenance processes. The series is provided through the joint efforts of the Pavement Preservation Program of the Federal Highway Administration (FHWA), and the Foundation for Pavement Preservation (FP^2).

FHWA uses its partnerships with FP^2, the American Association of State Highway and Transportation Officials, and State and local transportation agencies to promote pavement preservation.

To obtain other checklists or to find out more about pavement preservation, contact your local FHWA division office or FP^2 (at www.fp2.org) and check into these FHWA Web pages:

www.fhwa.dot.gov/preservation

www.fhwa.dot.gov/infrastructure/asstmgmt/resource.htm

Crack Seal Application Checklist

Preliminary Responsibilities

Project Review

- ❑ Is this project a good candidate for crack sealing?
- ❑ What type of cracking is there?
- ❑ What is the frequency and severity of the cracking?
- ❑ What is the frequency and severity of other pavement distresses?
- ❑ Review project for bid quantities.

Document Review

- ❑ Bid specifications
- ❑ Special provision
- ❑ Traffic control plan
- ❑ Construction manual
- ❑ Agency application requirements
- ❑ Manufacturer's sealant installation instructions
- ❑ Sealant manufacturer's safety data sheets

Materials Checks

- ❑ Sealants are selected based on temperature, traffic, and pedestrian traffic requirements.
- ❑ Sealant is from an approved source or listed on agency qualified products list (if required).
- ❑ Sealant has been sampled and tested prior to installation (if required).
- ❑ Sealant packaging is not damaged in ways that would prevent proper use (boxes leaking, pails/drums dented or pierced).
- ❑ If blotter material is to be used, it has been approved by the agency.
- ❑ If backer-rod is to be used, it is compatible with the sealant.

Preapplication Inspection Responsibilities

Surface Preparation

- ❑ The surface is clean and dry.
- ❑ Other pavement distresses have been repaired.

Equipment Inspections

Hot Applied Sealant Melters

- ❑ For hot applied sealants, an indirectly heated double boiler type melter with effective agitation is being used.
- ❑ Melter is in good working order with all heating, agitation, pumping systems, valves, thermostats, and other parts functioning.

- ❑ Melter heating system is thermostatically controlled.
- ❑ Temperature gauges are calibrated and checked for accuracy.
- ❑ Proper wand tips for desired application are used.

Other Application Equipment

- ❑ Pump for cold applied sealant functions correctly.
- ❑ Pour pots are in good working order.
- ❑ Material squeegees or other shaping/forming tools are clean, in good condition, and of appropriate configuration to produce desired sealant shape.

Crack Cutting/Cleaning Equipment

- ❑ Crack cutters/routers are in good working order.
- ❑ The router/cutter configuration is adjusted to the required reservoir width and depth.
- ❑ Cutting tools are in good condition, with no missing, chipped, rounded, or broken teeth.
- ❑ Air compressors have sufficient pressure and volume to clean cracks adequately and meet agency requirements.
- ❑ Air compressors are equipped with oil and moisture filters/traps that function properly.
- ❑ Hot air blaster/heat lances (if used) are working properly.
- ❑ Vacuum cleaning system (if used) is functioning properly.

Weather Requirements

- ❑ Review of manufacturer's installation instructions for requirements specific to sealant use is completed.
- ❑ Ambient and/or surface temperature meet manufacturer and all agency requirements (typically 4 °C [40 °F] and rising) for routing and sealing.
- ❑ Sealing does not proceed if rain is imminent.
- ❑ Application does not begin if there is any moisture on the surface or in the crack.

Traffic Control

- ❑ Signs and devices match the traffic control plan.
- ❑ The set-up complies with the local agency or Federal *Manual on Uniform Traffic Control Devices* (MUTCD).
- ❑ Flaggers do not hold traffic for too long.
- ❑ *Any unsafe conditions are reported to a supervisor.*
- ❑ Traffic is not opened to the sealed pavement until the sealant has adequately cooled or cured to not pick up on vehicle tires.
- ❑ Signs are removed or covered when they are no longer needed.

Project Inspection Responsibilities

Reservoir Cutting

- ❑ Routed reservoir is checked for correct configuration (width and depth).
- ❑ The asphalt concrete mixture is in sound enough condition to produce the required reservoir configuration without excessive spalling of the pavement during cutting.
- ❑ The cut reservoir is centered over the crack, and cutting of both sides of the crack back to sound pavement has occurred.
- ❑ Operator is wearing proper personal protective equipment.
- ❑ All safety mechanisms and guards on equipment are functioning properly.

Crack Cleaning (air blowing)

- ❑ Dirt and debris are blown from the crack. Dirt has not been blown from one crack to another that has already been cleaned. All dirt and debris are blown off the roadway.
- ❑ Check is conducted to verify that the crack has had all loosened dirt and debris removed by running a finger along the crack's sidewalls and examining for loose pavement, dust, and debris. If any dirt is found, crack is recleaned.
- ❑ Check is conducted for moisture in the crack and along the reservoir's sidewalls. If moisture is found, necessary steps are taken to remove the moisture.

- ❑ Operator is wearing proper personal protective equipment.
- ❑ Cleaning operation is positioned just ahead of the sealing operation to guard against debris blowing into cleaned cracks or newly sealed cracks.

Hot Air Blasting

- ❑ Hot air blasting is conducted immediately ahead of hot applied sealant installation to minimize condensation formation prior to sealing and to maintain warm temperature (5 minutes maximum time or 50 m [54 yards] maximum distance).
- ❑ Heated surfaces are slightly darkened and warmed. **EXTREME CAUTION IS USED** not to burn the existing pavement surface.
- ❑ Proper personal protective equipment is worn by operator.

Sealant Application

Hot Applied Sealants

- ❑ Manufacturer's and agency's temperature installation requirements are being followed.
- ❑ Melter heat transfer medium is heated to the correct temperature range.
- ❑ Sealant is heated to a minimum of the manufacturer's recommended pouring or application temperature, but temperature does not exceed the material's safe heating temperature.
- ❑ Sealant is continuously agitated to assure uniformity, except when adding additional material.

- ❑ Operator is wearing required personal protective equipment.
- ❑ If melter is equipped with a heated hose system, the hose is heated to operating temperature prior to beginning sealant application.
- ❑ If melter does not have a heated hose, the hose is verified to be unplugged and clear prior to beginning application.
- ❑ Sealant is recirculated through the hose to warm the hose prior to application. During idle periods, or if it is noted that sealant is cooling through the hose, sealant is recirculated through the hose back into the material vat to maintain hose temperature.
- ❑ Sealant temperature is checked periodically to assure proper temperatures.
- ❑ Melting vat is kept at least one-third full to help maintain temperature uniformity.
- ❑ Crack channel/reservoir is filled from the bottom up, to the specified level.
- ❑ Sealant material is formed/squeegeed/ finished (if required) to the specified configuration.
- ❑ Sufficient material is applied to form the specified configuration, but not so much as to oversupply squeegee.
- ❑ Surface Band-aid applications (if required) are within the specified thickness and width.
- ❑ De-tackifier or other blotter is applied to reduce tack prior to opening to traffic, if needed.

- ❑ Any sealant over-band is centered over the crack.
- ❑ Sealant is reapplied to low areas where sealant has settled or where too little material was applied.
- ❑ Adhesion is checked by pulling up cooled sealant. Unbonded sealant is removed and crack is resealed.

Cold Applied Sealant

- ❑ Manufacturer's installation instructions are followed.
- ❑ Sealant is applied using appropriate pumps or other application systems.
- ❑ Sealant is applied in the specified configuration.
- ❑ Sealant is allowed to cure for sufficient time to resist pick-up prior to opening to traffic.

Cleanup Responsibilities

- ❑ Excessive sealant application or spills are removed.
- ❑ All loose debris from cleaning is removed from the pavement surface.
- ❑ Sealant containers and other miscellaneous debris are removed and disposed of properly.
- ❑ Melters and other application equipment are properly cleaned for the next use.

Common Problems and Solutions

(Problem: Solution)

- **Sealant not adhering to crack:**
  1. Crack not clean enough—reclean.
  2. Wet cracks—allow to dry, or use heat lance.
  3. Low sealant application temperature—verify temperature gauges on melter, heat to correct temperature.
  4. Cold ambient temperature—allow temperature to rise, or use heat lance.
- **Sealant cracking or debonding in winter:**
  1. Sealant too stiff—use softer grade.
  2. Excessive pavement distresses.
  3. Poor cleaning during installation—improve cleaning.
  4. Not providing a widened reservoir—use a widened reservoir configuration.
  5. Snowplows pulling out sealant—apply sealant flush with pavement.
  6. Sealant installed too deep in crack—use correct depth to width ratio.

- **Sealant pick-up when opened to traffic:**
  1. Opened to traffic too soon after application—delay opening.
  2. Cracks not clean and/or dry: reclean or dry.
  3. High ambient temperature—seal in cooler temperatures.
  4. Excessive sealant application—apply flush with surface.
  5. Sealant too soft for climate—use stiffer sealant.
  6. Use a detackifier or blotter to reduce initial tack.
  7. Overheated or underheated sealant—install at correct temperature; check temperature gauges on melter.
  8. Sealant contaminated with solvent or heat transfer oil from tank leak.
- **Sealant gelling in melter:**
  1. Overheated sealant—check melter temperature gauges.
  2. Sealant reheated too many times—use fresh sealant.
  3. Use of sealant with short pot life—use sealant with longer pot life.

- **Bumps in asphalt concrete overlays; sealant adhering to overlay and interrupting shoving during mix compaction:**
  1. Excessive sealant applications on surface—use recessed or surface flushed sealant application.
  2. Seal at least 1 year prior to overlay.
  3. Apply detackifier or blotter to reduce sealant adhesion to overlay.
  4. Use of a pneumatic rubber tire roller as the breakdown roller—use of a dual-drive drum roller does not tend to shove the mix during compaction. Selection of roller type is especially critical for thin hot mix overlays.
  5. Use stiffer tack coat.

Sources

Information in this checklist is based on or refers to the following sources:

Annual Book of ASTM Standards. Volume 04.03, Specification D3405 and D5078. 2000. West Conshohocken, PA: American Society for Testing and Materials.

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Thin-Surfaced Pavements, Synthesis of User Practices 1998. Washington, DC: Transportation Research Board, National Cooperative Highway Research Program.

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