

# Recommended Performance Guideline For Crack Treatment

**A175**



## **NOTICE**

It is not intended or recommended that this guideline be used as a verbatim specification. It should be used as an outline, helping user agencies establish their particular project specification. Users should understand that almost all geographical areas vary as to the availability of materials. An effort should be made to determine what materials are reasonably available, keeping in mind system compatibility and specific job requirements. Contact ISSA for answers to questions and for a list of ISSA member contractors and companies.

**International Slurry Surfacing Association**  
**#3 Church Circle, PMB 250**  
**Annapolis, MD 21401**  
**(410) 267-0023**  
[www.slurry.org](http://www.slurry.org)

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# RECOMMENDED PERFORMANCE GUIDELINE FOR CRACK SEALING AND FILLING

## 1. SCOPE

The intent of this guideline is to aid in the design, testing, quality control, measurement and payment procedures for the application of Crack Sealing and Filling.

## 2. DESCRIPTION

The product shall be hot asphalt-based, polymer and/or rubber modified, or cold applied emulsified asphalt used to seal and/or fill cracks and joints in asphalt or Portland cement concrete pavements. Hot applied material is supplied in solid form. When melted and properly applied, it forms a resilient, adhesive and flexible compound that resists cracking in cold temperatures and tracking in hot temperatures. Cold applied material is supplied as an emulsified asphalt-based treatment.

## 3. APPLICABLE SPECIFICATIONS

Products are manufactured to meet many different federal, state, local, ASTM and AASHTO specifications. If no specifications are supplied, contact a local supplier to determine the appropriate products for your region.

## 4. MATERIALS

### 4.1 **HOT APPLIED CRACK SEALANT**

Crack sealants are more commonly utilized in regions with more freeze/thaw cycles. The sealant is designed to be more flexible than the existing pavement to withstand greater pavement movements generated by multiple freeze/thaw cycles.

### 4.2 **HOT APPLIED CRACK FILLER**

Crack fillers are more commonly utilized in regions with warmer climates where pavements undergo minimal movement. The filler is typically applied in longitudinal crack and cold joints in the pavement. It is designed to withstand higher temperatures and heavier traffic loads.

### 4.3 **COLD APPLIED CRACK FILLER**

Emulsified asphalt similar to CQS, CRS2 or similar emulsified oils that meet the requirement of the local area/ climate. These products are normally used in areas with little or no thermal movement.

## 5. LABORATORY EVALUATION

### 5.1 **GENERAL**

Product manufacturers will warranty and certify that their products meet applicable ASTM, AASHTO, Federal or State specifications at time of shipment.

## **5.2 PRODUCT DESIGN**

Some state and local agencies have product design specifications, requiring manufacturer or independent laboratory certification. Other agencies require pre-approved products, identified by lot number, with verification of specification compliance before the project begins.

## **6. EQUIPMENT**

### **6.1 GENERAL**

All equipment, tools and machines used in the application of crack treatments shall be maintained in satisfactory working condition at all times.

### **6.2 MELTER APPLICATOR (HOT APPLIED)**

The melter applicator unit shall be a self-contained double boiler device with the transmittal of heat through heat transfer oil. It must be equipped with an on board automatic heat controlling device to permit the attainment of a predetermined temperature, and then maintain that temperature as long as required. The unit shall also have a means to vigorously and continuously agitate the product. The product shall be applied to the pavement under pressure supplied by a gear pump with a hose, wand and direct connecting applicator tip. The pump shall have sufficient pressure to apply product at a rate of at least three gallons (11.4 liters) per minute. Melter applicators shall be approved for use by the product manufacturer.

In some cases, a direct-fire melter can be used. The use of a direct-fire melter requires a product designed to handle direct fire without being scorched or degraded in the melter.

### **6.3 COLD APPLIED APPLICATION EQUIPMENT**

Cold applied material can be premixed and applied direct from the original container or through appropriately designed application equipment.

### **6.4 AUXILIARY EQUIPMENT**

Suitable surface preparation equipment, traffic control equipment, hand tools, and other support and safety equipment necessary for proper product application shall be provided by the contractor.

## **7. CALIBRATION**

Calibration of thermostats and gauges should be performed routinely to assure correct temperature of heat transfer oil and product.

## **8. WEATHER LIMITATIONS**

### **8.1 HOT APPLIED MATERIAL**

Apply the product when the pavement temperature exceeds 40°F (4°C). Lower temperatures may result in reduced adhesion due to the presence of moisture or ice. If the pavement temperature is lower than 40°F (4°C), it may be warmed using a heat lance without placing a direct flame on the pavement. If applying at lower pavement temperatures than 40°F (4°C), extreme care should be used to ensure that cracks or joints are dry and free from ice and other contaminants. Product temperatures should be

maintained at the maximum heating temperature recommended by the manufacturer. If applying at night, ensure that dew is not forming on the pavement surface. After application, the product should be checked by qualified personnel to ensure that adhesion is adequate.

## **8.2 COLD APPLIED MATERIAL**

Best placement conditions are dry pavements with minimum air temperature of 40°F (4°C) and rising with no threat of moisture within 24 hours.

## **9. NOTIFICATION AND TRAFFIC CONTROL**

### **9.1 NOTIFICATION**

Homeowners and business affected by the treatment application process shall be notified at least one day in advance of the application. If work does not begin on the specified day, a new notification will be distributed identifying the new starting date. The notification shall be posted in written form, stating the time and date that the application will take place. If necessary, signs alerting traffic to the intended project should be posted.

### **9.2 TRAFFIC CONTROL**

Traffic control devices shall be placed in accordance with agency requirements and, if necessary, conform to the requirements of the Manual on Uniform Traffic Control Devices. Opening to traffic does not constitute acceptance of the work.

## **10. SURFACE PREPARATION**

### **10.1 CLEANING**

Cracks may be cleaned and filled without reservoirs. Reservoirs are created via routing. Studies suggest longer life may be achieved with reservoirs. The joint and crack cleaning equipment shall be capable of producing compressed air at 90 psi (620 kPa) minimum at the tip. Functioning water and oil separators must be utilized on the compressor unit. Immediately prior to applying the product, cracks shall be thoroughly cleaned to remove loose particles of grass, grass roots, weeds, dirt, dust, and other deleterious substances.

During the cleaning of cracks, the Contractor shall protect against damage to items such as cars, people, driveways, walkways, landscape materials, etc.

### **10.2 ROUTING**

Routing should be considered in areas with increased thermal movement or when a high performance product is preferred.

#### **10.2.1 ROUTING**

A routing operation should be used to create a product reservoir. Cutting should remove at least 1/8 in (3 mm) from each side and produce vertical, intact surfaces with no loosely bonded aggregate. Joints and cracks should be routed to a 3/4 in (19 mm) wide x 3/4 in (19 mm) deep configuration for a typical application. A low profile configuration of 1 1/2 in (40 mm) wide x 3/8 in (10 mm) deep may be used in colder climates. However, studies suggest a 2:1 (Width:Depth) maximum ratio for enhanced thermal movement performance. If crack sealing is performed on a

surface that was previously chip sealed or slurry surfaced, the low profile configuration depth should be 5/8 in (15 mm) deep. The pavement should be sound enough to resist significant spalling during cutting. Final reservoir width should not exceed twice the cutter width or 1 1/2 in (38 mm) maximum.

## **11. APPLICATION**

### **11.1 GENERAL GUIDELINES**

#### **11.1.1 HOT APPLIED**

No product shall be applied until joints and cracks requiring treatment have been cleaned, inspected and approved. Product manufacturer's heating and application instructions shall be followed.

The product shall not be applied when the weather is foggy or when rain threatens. When the atmosphere or pavement temperature is below 40°F (4°C), a heat lance is used to warm the pavement immediately prior to product application. The pavement surface must be clean and dry. The product temperature shall meet the manufacturer's recommendations.

The product shall be applied in the crack or joint reservoir uniformly from bottom to top and filled without formation of entrapped air or voids.

Many joint and crack walls in concrete pavements have weakened or spalled surfaces. It is recommended that the crack or joint be slightly overfilled then leveled with a 3 inch (7.6 cm) sealing disk or V-shaped squeegee to create a neat overband extending ± 1 inch (2.5 cm) on each side of the crack or joint for surface strength and waterproofing.

If the pavement being sealed will be overlaid with HMA within six months of sealant application, it is recommended that the cracks be routed with a pavement cutter and sealant placement shall be recessed 1/4" (6 mm) in the crack or joint reservoir with no overband. If routing is not used, the sealant overband thickness and width should be kept as narrow as possible.

#### **11.1.2 COLD APPLIED**

Apply materials with the nozzle in the crack channel, so the channel is filled from the bottom up to avoid trapping air in the product.

Apply materials in a continuous motion, filling the channel to the proper level for recessed configurations or provide a sufficient amount to flush, cap, or overband the crack channel.

Reapply material to any crack segment where material shrinkage or insufficient material was applied in a previous pass or application.

Recirculate the material through the wand into tank during idle periods.

## **11.2 BLOTTER MATERIAL**

### **11.2.1 HOT APPLIED**

On two lane roads, or where traffic may be likely to come in contact with the hot sealant before it cures, a blotter or specialized release agent may be required to prevent asphalt bleed and/or pickup of sealant by vehicular traffic. It should be compatible with the product and any surface treatment being used.

### **11.2.2 COLD APPLIED**

A fine-graded sand with a particle size of 1/8" (3 mm) minus is primarily used. It should be applied in a thin layer and fully covers the exposed crack fill material to prevent tracking.

## **11.3 CLEAN UP**

Old material and other debris resulting from crack preparation and product application shall be picked up and disposed of prior to opening the pavement at the end of each work day.

If melters require clean out, follow manufacturer's instructions. If solvent is used, ensure it does not contaminate the product to avoid dilution and flash problems.

## **12. QUALITY CONTROL**

### **12.1 INSPECTION**

The project Inspector must be familiar with the materials, equipment and application of the product. Local conditions and specific project requirements should be considered when determining the parameters of field inspection.

## **13. METHOD OF MEASUREMENT**

The cleaning and sealing of joints and cracks shall be paid for by the amount of lineal feet, pounds/gallons of product, or pavement surface of joints and cracks cleaned, treated, and accepted by the Inspector.

## **14. PAYMENT**

The product application will be paid for at the contract unit prices per lineal foot (meter), pounds/gallons (kg/liters) of product or pavement surface area of cleaning and sealing cracks and joints in the pavement. Price and payment shall constitute full compensation for all traffic control protection, routing, preparation and disposal of loose materials, the materials, labor, equipment, tools, supervision and incidentals necessary to complete the work.

## **15. APPLICATION PRECAUTIONS**

In certain situations, additional consideration should be given to product selection and application geometries.

### **15.1 PARKING LOT, SLOW MOVING TRAFFIC AND PEDESTRIANS**

Products used in these areas must be stiff enough at summer temperatures to resist pick up.

### **15.2 OVERLAY, SURFACE TREATMENT OR SEAL COAT OVER SEALANT**

Crack treatments may be subject to overlay heat effects. Solvent and carriers for surface treatments and seal coats may soften crack treatments. If the product is applied on top of the pavements, and an overlay is then placed, bumps may occur during compaction. Prior to placing a surface treatment, a test strip should be placed to verify compatibility of the crack treatment product and the surface treatment.

### **15.3 High Severity Cracked Areas**

Highly cracked areas (fatigue cracks in wheel paths) should not be treated by covering cracks because pavement friction may be affected. These cracks can be filled if followed by a surface treatment or overlay to restore friction.

### **15.4 Fuel or Oil Spill Area**

Crack treatments should not be used in fuel or oil spill areas due to potential softening of the product. The product will not adhere to asphalt or concrete pavement surfaces that are contaminated with oil spills.