



# Standard Specification for Crack Filler, Hot-Applied, for Asphalt Concrete and Portland Cement Concrete Pavements<sup>1</sup>

This standard is issued under the fixed designation D 5078; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers hot-applied crack filler for use in filling cracks in asphalt concrete and portland cement concrete pavements.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.3 The values stated in inch-pound units are to be regarded as the standard. The values in parentheses are for information only.

## 2. Referenced Documents

### 2.1 ASTM Standards:

D 5 Test Method for Penetration of Bituminous Materials<sup>2</sup>

D 36 Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)<sup>3</sup>

D 217 Test Method for Cone Penetration of Lubricating Grease<sup>4</sup>

D 5167 Practice for Melting of Hot-Applied Joint and Crack Sealant and Filler for Evaluation<sup>2</sup>

D 5329 Test Methods for Sealants and Fillers, Hot-Applied, for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements<sup>2</sup>

## 3. General Requirements

3.1 The hot-applied crack filler shall be a compound that will effectively fill cracks in both asphalt concrete and portland cement concrete pavements. The crack filler shall resist softening and pickup by vehicle tires at ambient summer temperatures when used in an appropriate manner. The material shall be capable of being heated to the specified safe heating temperature (see 4.1) in appropriate melting units, shall be capable of being effectively applied to pavement cracks through pressure fed melter-applicator equipment, and shall be

suitable for filling cracks that are a minimum of  $\frac{3}{8}$  in. in width (see Appendix X1).

## 4. Physical Requirements

4.1 *Safe Heating Temperature*—The safe heating temperature is the highest temperature to which the crack filler can be heated and still conform to all requirements of this specification. The safe heating temperature shall be a minimum of 20°F (11°C) higher than the manufacturer's minimum recommended application temperature. For testing purposes, the pouring temperature for specimen preparation shall be the safe heating temperature recommended by the manufacturer. The safe heating temperature shall be shown on all containers and shall be provided to the testing agency before any laboratory tests are begun.

4.2 *Softening Point*—The softening point of the crack filler shall be a minimum of 150°F (65.5°C).

4.3 *Cone Penetration, Non-Immersed*—At  $77 \pm 0.2^\circ\text{F}$  ( $25 \pm 0.1^\circ\text{C}$ ), 150 g, for 5 s, shall not exceed 70 units.

4.4 *Cone Penetration at 39.2°F (4°C)*—At  $39.2 \pm 0.2^\circ\text{F}$  ( $4 \pm 0.1^\circ\text{C}$ ), 200 g, for 60 s, shall be a minimum of 15 units.

4.5 *Resilience*—At  $77 \pm 0.2^\circ\text{F}$  ( $25 \pm 0.1^\circ\text{C}$ ), shall be a minimum of 30 % recovery.

4.6 *Asphalt Compatibility*—There shall be no failure in adhesion, formation of an oily exudate at the interface between the crack filler and the asphalt concrete specimen, or softening or other deleterious effects on the asphalt concrete or crack filler when tested at 140°F (60°C) for 72 h.

## 5. Sampling

5.1 Samples may be taken at the plant or warehouse prior to delivery or at the time of delivery, at the option of the purchaser. If sampling is done prior to shipment, the inspector representing the purchaser shall have free access to the material to be sampled. The inspector shall be afforded all reasonable facilities for inspection and sampling which shall be conducted so as not to interfere unnecessarily with the operation of the works.

5.2 Samples shall consist of one of the manufacturer's original sealed containers selected at random from the lot or batch of finished material. A batch or lot shall be considered as all finished material that was manufactured simultaneously or continuously as a unit between the time of compounding and the time of packaging or placing in shipping containers.

5.3 The crack filler portion for testing shall be obtained

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.03.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 04.04.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 05.01.

from the selected manufacturer's original container in accordance with Practice D 5167. The sample portion for testing which is added to and heated in the melter shall weigh  $800 \pm 50$  g.

## 6. Heating

6.1 Heat the material in accordance with Practice D 5167.

6.1.1 The oil bath in the melter shall be heated to a temperature between the sealant safe heating temperature and  $75^{\circ}\text{F}$  ( $41.7^{\circ}\text{C}$ ) above the sealant safe heating temperature, and in no case shall be more than  $550^{\circ}\text{F}$  ( $288^{\circ}\text{C}$ ). Add the sealant sample to the melter according to instructions in Practice D 5167. After the sample has been added to the melter, the oil bath temperature shall be regulated within the above listed temperature limits to raise the sealant temperature to the manufacturer's recommended safe heating temperature within the required 1 h time as stated in Practice D 5167. The sample shall then be maintained at the safe heating temperature while being continuously stirred until a total of 90 min from the time the first segment was added to the melter has elapsed. Specimens for physical testing are then poured from the heated material.

6.1.2 Required specimens for cone penetration and resilience testing shall be poured into appropriate sample containers until slightly overfilled, and then immediately leveled to flush with the top of the sample container using a straightedge. Three specimens in 6-oz (177-mL) sample containers shall be poured. Two are for cone penetration testing and one for resilience testing.

## 7. Test Methods

7.1 *Specimen Curing*—All specimens shall be cured at standard laboratory atmospheric conditions specified in Test Methods D 5329 for  $24 \pm 2$  h prior to beginning any testing.

7.2 *Softening Point*—Use Test Method D 36.

7.3 *Cone Penetration, Non-Immersed*—Use Test Method D 5329.

7.4 *Cone Penetration at  $39.2^{\circ}\text{F}$  ( $4^{\circ}\text{C}$ )*:

7.4.1 Perform testing at  $39.2^{\circ}\text{F}$  using the cone as specified in Cone Penetration, Non-Immersed of Test Methods D 5329 and Test Method D 217 with an additional weight to yield a total moving weight of  $200 \pm 0.1$  g. Conduct testing in accordance with Test Method D 5 at  $39.2 \pm 0.2^{\circ}\text{F}$  ( $4 \pm 0.1^{\circ}\text{C}$ ) using a 60 s penetration time.

7.5 *Resilience*—Use Test Method D 5329.

7.6 *Asphalt Compatibility*—Use Test Method D 5329.

## 8. Packaging and Package Marking

8.1 The hot-applied crack filler shall be delivered in the manufacturer's original sealed containers. Each container shall be legibly marked with the name of the manufacturer, the trade name of the material, the manufacturer's batch number or lot number, the safe heating temperature, and the minimum application temperature for use.

8.2 The containers shall individually not weigh more than 60 lbs and shall be constructed to facilitate easy removal of the crack filler. Any surface covering or non-adherent film which is used in packing shall melt into the material when heated and shall not result in application or field performance difficulties.

## 9. Keywords

9.1 asphalt concrete pavement; crack; hot-applied crack; portland cement concrete pavement

## APPENDIX


### (Nonmandatory Information)

#### X1. PRECAUTIONS ON USE AND APPLICATION OF CRACK FILLER, HOT-APPLIED, FOR ASPHALT CONCRETE AND PORTLAND CEMENT CONCRETE PAVEMENTS

X1.1 Some, if not all, of the known materials conforming to this specification may be damaged by heating at too high a temperature, or by heating for too long a time. Care should be exercised to secure equipment for heating and application that is suitable for the purpose. The material should be heated in a kettle or melter, constructed as a double boiler, with the space between the inner and outer shells filled with oil or other heat transfer medium. Positive temperature control, mechanical agitation, and recirculation pumps should be provided. Other methods of indirect heating satisfactory to the engineer may be used. The crack filler should be heated to a temperature that is at least the manufacturer's minimum recommended application temperature. Temperature should not exceed the material safe heating temperature.

X1.2 Pavement cracks to be filled with material covered by this specification should be dry and clean of all dirt, dust, or other contaminants so that adhesion to the crack surfaces is developed. Cleaning methods used shall be as required for specific job conditions. Methods commonly used include blowing with compressed air, routing, or use of a wire brush type cleaner.

X1.3 Several different application geometries are commonly used for filling cracks with crack filler for various filling situations. Application should be performed in a neat, workmanlike manner.

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